



"Dissemination of Education for Knowledge, Science and Culture."
- Shikshanmaharshi Dr. Bapuji Salunkhe



SHRI SWAMI VIVEKANAND SHIKSHAN SANSTHA'S
VIVEKANAND COLLEGE, KOLHAPUR (EMPOWERED AUTONOMOUS)

2130, 'E' Ward, Tarabal Park,
Tal. Karveer, Dist. Kolhapur - 416 003.
Affiliated to Shivaji University, Kolhapur (M.S.)

NAAC Reaccredited : "A" (CGPA - 3.24 in 3rd Cycle)
College with Potential Excellence by U.G.C., New Delhi
"Star College" by D.B.T. Govt. of India
ISO 9001 : 2015

Ph. : 0231-2658612 | Fax : 0231-2658840 | Resl. : 0231-2653962 | Website : www.vivekanandcollege.ac.in | E-mail : info@vivekanandcollege.org

Founder
Dr. Bapuji Salunkhe
D. Lit.

President
Hon. Chandrakant Dada Patil
Higher and Technical Education Minister, Maharashtra

Chairman
Prin. Abhaykumar Salunkhe
M.A.

Secretary
Prin. Mrs. Shubhangi Gawade
M.Sc., B.Ed.

Principal
Dr. R. R. Kumbhar
M.Sc., M.Phil., Ph.D.

1.3 Curriculum Enrichment

1.3.3 Percentage of programmes that have components of field projects / research projects / internships during the last five years.

Syllabi of programmes which have component of field projects / research projects / internships.

INDEX

Sr. No.	Specific Programmes	Page no.
1	B.A. Marathi	1-21
2	B.A. English	22-43
3	B.A. Hindi	44-64
4	B.A. Political Science	65-82
5	B.A. Sociology	83-110
6	B.A. Home Science	111-143
7	B.A. Geography	144-171
8	B.A. Economics	172-195
9	B.A. I History	196-214
10	B. Sc. Zoology	215-236
11	B.Sc. Electronics	237-252

12	B.Sc. Botany	253-278
13	B.Sc. Statistics	279-319
14	B.Sc. Mathematics	320-329
15	B.Sc. Computer Science	330-347
16	B.Sc. Chemistry	348-380
17	B.Sc. Biotechnology Optional	381-401
18	B.Sc. Microbiology	402-433
19	B.Com. II Environment Science	434-438
20	B.C.A.	439-463
21	B.B.A.	464-496
22	B.Sc. Biotechnology Entire	497-523
23	B.Sc. Computer Science Entire	524-546
24	B.Voc. Foundry Technology	547-568
25	B.Voc. Graphic Design	569-590
26	B.Voc. Animation and Filmmaking	591-609
27	B.Voc. Photography and Videography	610-631
28	Community College Diploma in Cinematography	632-644
29	Community College Diploma in Event Photography	645-661
30	PG Diploma in Geoinformatics	662-669
31	PG Diploma in Hindi Translation	670-676
32	Community College Diploma in Foundry Technology	677-699
33	Community College Diploma in Photogragraphy	700-712

34	M.A. History	713-745
35	M.Com.	746-806
36	M.Sc. Organic Chemistry	807-839
37	M.Sc. Inorganic Chemistry	840-878
38	M.Sc. Analytical Chemistry	879-919
39	M.Sc. Mathematics	920-934
40	M.Voc. Foundry Technology	935-969
41	M.Voc. Graphic Design	970-987
42	M.Sc. Statistics	988-1014
43	M.Sc. Computer Science	1015-1049
44	M.Sc. Microbiology	1050-1079
45	M.Sc. Mathematics	1080-1113



R. R. Kumbhar

Dr. R. R. Kumbhar

PRINCIPAL

VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

श्री स्वामी विवेकानंद शिक्षण संस्था, कोल्हापूर संचालित
विवेकानंद कॉलेज, कोल्हापूर (स्वायत्त)



मराठी विभाग

बी. ए. भाग – ३

सत्र पाचवे व सहावे

अभ्यासक्रम

Choice Based Credit System

शैक्षणिक वर्ष २०२०-२१

Vivekanand College, Kolhapur (Autonomous)
Choice Based Credit System Syllabus - Marathi
June, 2020 onwards
Class : B. A. III

Discipline Specific Core (DSC) : MARATHI Course

विद्याशाखीय विशेष गाभा (DSC) सत्र - पाचवे

मराठी अभ्यासपत्रिका क्र. ७

भारतीय काव्यशास्त्र

CO 1- पौर्वात्य काव्यशास्त्राची ओळख करून देणे.

CO 2 - काव्याची लक्षणे, प्रयोजने आणि कारण समजावून देणे.

CO 3 - साहित्याची निर्मितीप्रक्रिया आणि स्वरूप यांची ओळख करून देणे.

CO 4 - भाषेतील अलंकारांची ओळख करून देणे.

विभाग/ Module	Topic	Teaching Hours	Credit
विभाग 1 Module I	काव्यलक्षण <ul style="list-style-type: none">• काव्यशरीर व काव्याचा आत्मा• अलंकार आणि वक्रोक्ती• पौर्वात्य काव्यलक्षणे	१५	१
विभाग 2 Module II	काव्यप्रयोजन आणि काव्यकारण <ul style="list-style-type: none">• मम्मटाची काव्यप्रयोजने• काव्यकारण – प्रतिभा• काव्यनिर्मितीची जनक कारणे	१५	१
विभाग 3 Module III	रसविचार <ul style="list-style-type: none">• भावविचार• भरताचे रससूत्र• रसकसोट्या	१५	१
विभाग 4 Module IV	अलंकार <ul style="list-style-type: none">• अनुप्रास• यमक• उपमा• स्वभावोक्ती• रूपक	१५	१

संदर्भ ग्रंथसूची

- | | |
|--------------------------|---------------------------|
| १. अभिनव काव्यप्रकाश | – रा. श्री. जोग |
| २. काव्यशास्त्रप्रदीप | – स. रा. गाडगीळ |
| ३. भारतीय साहित्यशास्त्र | – ग. त्र्यं. देशपांडे |
| ४. सुलभ काव्यशास्त्र | – पं. महादेवशास्त्री जोशी |
| ५. काव्यशास्त्र परिचय | – शिवशंकर उपासे |
| ६. सुगम मराठी व्याकरण | – मो. रा. वाळिंबे |

Choice Based Credit System Syllabus – Marathi

June 2020 Onwards

Class : B. A. III

Discipline Specific Core (DSEC) : MARATHI Course

विद्याशाखीय विशेष गाभा (DSC) सत्र - ५

मराठी अभ्यासपत्रिका क्र. ८ भाषाविज्ञान आणि मराठी भाषा

CO 1 - भाषेचे स्वरूप, कार्य, महत्त्व विशद करणे.

CO 2 - मानवी व मानवेतर भाषासंज्ञापनाची माहिती देणे .

CO 3 - भाषेतील ध्वनी .वाक्य व अर्थविचार समजावून देणे ,शब्द ,

CO 4 - मराठी भाषेचे व्याकरण व वर्णविचार समजावून देणे

विभाग/ Module	प्रकरण/Topic	Teaching Hours	श्रेयांक/ Credit
विभाग 1 Module I	१. भाषाव्यवहाराचे स्वरूप -भाषेची व्याख्या, वैशिष्ट्ये व कार्य - भाषा संदेशन (मानवी आणि मानवेतर) -भाषेबद्दलचे दृष्टीकोन आणि समजुती	१५	१
विभाग 2 Module II	२. भाषेतील स्वनिम व रूपिम विचार - स्वनिम-स्वनिम-स्वनांतर संकल्पना, -स्वनिम निश्चित करण्याची तत्वे (व्यवच्छेदक, पूरक,वैकल्पिक) - रूप, रूपिम, रुपिकांतरे, संकल्पना, -रुपिमांचे प्रकार-अनन्यसाधारण, मीलन,आशयसुचक,वैकल्पिक	१५	१
विभाग 3 Module III	३. भाषेची संरचना व कार्य (वाक्य व अर्थ) - वाक्यविचार-प्रथमोपस्थित संघटक, रचना (अंत व पृष्ठस्तरीय) -वाक्य रचनांचे प्रकार-अंतःपदप्रधान व बाह्यपदप्रधान -अर्थविचार-शब्दाचा अर्थ,निर्देश, प्रतिमा, संकल्पना ई. -अर्थाच्या विविध छटा , अर्थाचे प्रकार	१५	१
विभाग 4 Module IV	४. भाषेचे व्याकरण- वर्णव्यवस्था -स्वरव्यवस्था, स्वरांची रचना व वर्गीकरण -व्यंजनव्यवस्था, व्यंजनांची रचना व वर्गीकरण	१५	१

संदर्भ ग्रंथसूची :

अ) मूलभूत वाचन

१. आधुनिक भाषाविज्ञान - डॉ. कल्याण काळे, डॉ. अंजली सोमण
२. भाषाशास्त्र विचार - र. बा. मंचरकर
३. आधुनिक भाषाविज्ञान आणि मराठी भाषा - डॉ. दादा गोरे
४. मराठीचे वर्णनात्मक भाषाविज्ञान - डॉ. महेंद्र सुदाम कदम
५. मराठी भाषा उगम आणि विकास - कृ.पा. कुलकर्णी.
६. भाषाविज्ञान आणि मराठी भाषा - अनिल गवळी, हिरण्यकेशी पब्लिकेशन, कोल्हापूर
७. सुबोध भाषाशास्त्र- प्र. न. जोशी.
८. भाषाविज्ञान परिचय-(संपा.) डॉ.सुलक्षणा कुलकर्णी, डॉ. वसंत कुबेर
९. आधुनिक भाषाविज्ञान : सिद्धांत आणि उपयोजन - मिलिंद मालशे
१०. भाषा आणि भाषाशास्त्र - श्री. न .गजेद्रगडकर
११. शास्त्रीय मराठी व्याकरण - मो. के. दामले
१२. सुगम मराठी व्याकरण - मो. रा. वाळिंबे
१३. मराठी व्याकरण परिचय - राजशेखर हिरेमठ

ब) पूरक वाचन

१. मराठीचा भाषिक अभ्यास - मु .श्री. कानडे
२. भाषाविज्ञान वर्णनात्मक व ऐतिहासिक -(संपा) मालसे, इनामदार, सोमण
३. भाषा इतिहास आणि भूगोल - ना. गो. कालेलकर
४. मराठी भाषा वाढ आणि विचार - श्री. के. क्षीरसागर
५. मराठीचे वर्णनात्मक भाषाविज्ञान - महेंद्र कदम
६. शुद्धलेखन विवेक - द .न .गोखले

क) संदर्भ ग्रंथ

१. भाषा आणि संकृती - ना. गो. कालेलकर
२. मराठी लेखन कोश - यास्मीन शेख
३. ध्वनीविचार- ना .गो. कालेलकर
- ४ . A course in Morden linguistics, oxford Newyark 1958
५. Brower Reuben (ED).On Translation (या ग्रंथातील On linguistic Apects of Translation हा Roman Jakobsn चा लेख)
६. Lobov William : The Social Motivation of a sonrd change

Choice Based Credit System Syllabus – Marathi

June 2020 Onwards

Class : B. A. III

Discipline Specific Core (DSC) : MARATHI Course

विद्याशाखीय विशेष गाभा (DSC) सत्र - ५

मराठी अभ्यासपत्रिका क्र. ९

मराठी वाङ्मयाचा इतिहास (मराठी भाषा प्रारंभ ते समर्थ संप्रदाय)

CO 1 - मध्ययुगीन वाङ्मयीन इतिहासाचा परिचय करून देणे .

CO 2 - मध्ययुगीन कालखंडातील वाङ्मयीन परंपरा रचनाप्रकार व ग्रंथकारांची माहिती करून देणे ,.

CO 3 - मध्ययुगीन कालखंडातील वाङ्मयनिर्मितीच्या प्रेरणांचा व सांस्कृतिक पार्श्वभूमीचा उलगाडा करणे.

CO 4 - मध्ययुगीन कालखंडातील प्रमुख संप्रदाय व ग्रंथनिर्मिती याचा अनुबंध स्पष्ट करणे.

विभाग/ Module	प्रकरण/Topic	Teaching Hours	श्रेयांक/ Credit
विभाग 1 Module I	१. मराठी भाषा प्रारंभ, मुकुंदराज ग्रंथसंपदा २. महानुभाव संप्रदाय, स्वरूप व गद्यग्रंथ ४. महदंबेचे धवळे आणि महानुभवाचे पद्य ग्रंथ	१५	१
विभाग 2 Module II	१. वारकरी संप्रदाय, संत ज्ञानेश्वर व नामदेवांचे ग्रंथकर्तृत्व २. संतमेळ्यातील इतर संतकवी- गोरकुंभार, चोखामेळा, सावतामाळी, सेना महाराज, मुक्ताबाई, जनाबाई, ३. समन्वयकार संत एकनाथांचे ग्रंथकर्तृत्व	१५	१
विभाग 3 Module III	१. संत तुकाराम व तुकाराम शिष्या बहिणाबाई २. समर्थ संप्रदाय व त्यांचे वाङ्मयीन कार्य ४. इतर धर्मियांची ग्रंथसंपदा - फादर स्टिफन, फादर क्रुवा शेख महमद, हुसेन अंबरखान,	१५	१
विभाग 4 Module IV	४. महाराष्ट्राची कीर्तन परंपरा : नारदीय, वारकरी ५. रचनाप्रकार : ओवी, अभाग, गवळण आणि भारुडे	१५	१

संदर्भ ग्रंथसूची :

अ) मूलभूत वाचन

१. मराठी वाङ्मयाचा इतिहास खंड - १ ते ३ महाराष्ट्र साहित्य परिषद, पुणे
२. प्राचीन मराठी वाङ्मयाचा इतिहास - खंड १ ते ४ - डॉ. अ. ना. देशपांडे
३. प्राचीन मराठी वाङ्मयाचा इतिहास - ल. रा. नसिराबादकर
४. प्राचीन मराठी वाङ्मयाचे स्वरूप - ह. श्री. शेणोलीकर
५. प्राचीन मराठी वाङ्मयाचा इतिहास - खंड १ व २ - ल. रा. पांगारकर
६. संत पंत आणि तंत - श्री म. माटे

ब) पूरक वाचन

१. संत एकनाथ दर्शन - संपा. डॉ. हे. वि. इनामदार
२. पाचभक्ती संप्रदाय - र. रा. गोसावी
३. संत वाङ्मयाची सामाजिक फलश्रुती - गं. . बा. सरदार
४. महाराष्ट्रीय संतमंडळाचे ऐतिहासिक कार्य - बा. र. सुंखठणकर
५. ज्ञानदेव आणि नामदेव - शं. दा. पेंडसे
६. मराठी बखर - र. वि. हेरवाडकर
७. मराठी शाहिरी पोवाडा - डॉ. विश्वनाथ शिंदे
८. पैजण - संपा. म. ना. अदवंत
९. मराठी काव्यातील शिवदैवत दर्शन - डॉ. शिवशंकर उपासे
१०. एकनाथांची निवडक भारुडे - संपा. वसंत जोशी
११. आज्ञापत्र - संपा. विलास खोले

संदर्भ ग्रंथ

१. सर्वात्मभावी तुकाराम - डॉ. अनिल गवळी
२. श्री. नामदेव दर्शन - संपा. नि. धो. मिरजकर
३. संत नामदेव - डॉ. हे. वि. इनामदार
४. पाच संतकवी - डॉ. शं. गो. तुळपुळे
५. वारकरी संप्रदाय : उदय व विकास भा. प. भहिरट
६. संत साहित्य संदर्भ कोश - मु. श्री. कानडे
७. मराठी साहित्याचे आदिबंध - उषा देशमुख
८. जनाबाईचे निवडक अभंग - सुहासिनी इर्लेकर

Choice Based Credit System Syllabus - Marathi

June, 2020 onwards

Class : B. A. III

Discipline Specific Core (DSC) : MARATHI Course

विद्याशाखीय विशेष गाभा (DSC) सत्र - पाचवे मराठी अभ्यासपत्रिका क्र. १०

मराठी भाषा : सर्जन आणि उपयोजन

CO 1 - औपचारिक आणि अनौपचारिक क्षेत्रांनुसार भाषिक व्यवहार समजावून देणे.

CO 2 - विविध क्षेत्रातील भाषिक कौशल्ये आणि क्षमता विकसित करणे .

CO 3 - लेखन, वाचन आणि भाषण या कौशल्यांचा विकास करणे .

CO 4 - उपयोजित व सर्जनशील लेखनास विद्यार्थ्यांना उद्युक्त करणे.

विभाग/ Module	Topic	Teaching Hours	Credit
विभाग 1 Module I	सर्जनशील लेखन प्रक्रिया <ul style="list-style-type: none">• सर्जनशीलता म्हणजे काय?• भाषिक सर्जनशीलता• सर्जनशील अभिव्यक्ती	१५	१
विभाग 2 Module II	ललित गद्य <ul style="list-style-type: none">• ललित गद्य म्हणजे काय?• ललित गद्य : भाषा विशेष• ललित गद्य : अभिव्यक्ती विशेष	१५	१
विभाग 3 Module III	नाटक <ul style="list-style-type: none">• नाटक म्हणजे काय?• नाटक : संवाद लेखन• नाटक : प्रयोगमूल्य	१५	१
विभाग 4 Module IV	सर्जनशील लेखन <ul style="list-style-type: none">• लघुनाट्य• ललित गद्य	१५	१

संदर्भग्रंथ सूची

१. सृजनात्मक लेखन – आनंद पाटील
२. रूपनिरूपण – शिरीष गोपाळ देशपांडे
३. वाङ्मय : अध्ययन आणि प्रकार – संपा. मिलिंद मालशे

Discipline Specific Core (DSC) : MARATHI Course

विद्याशाखीय विशेष गाभा (DSC) सत्र - ५

मराठी अभ्यासपत्रिका क्र. ११ वाङ्मय प्रवाहाचे अध्ययन (विज्ञान साहित्य)

साहित्यकृती - प्रेषित (कादंबरी) - जयंत नारळीकर

CO 1 - मराठीतील विविध साहित्य प्रवाहाचा परिचय करून देणे.

CO 2 - कादंबरी या वाङ्मय प्रकारची ओळख करून देणे .

CO 3 - विज्ञान साहित्यातील प्रवाह .वैशिष्ट्ये व विकास समजावून देणे ,स्वरूप ,प्रेरणा ,

CO 4 - अभ्यासासाठी नेमलेल्या साहित्यकृतीद्वारे संबधित साहित्य प्रकाराचे आकलन करून देणे.

विभाग/ Module	प्रकरण/Topic	Teaching Hours	श्रेयांक/ Credit
विभाग 1 Module I	१. विज्ञान साहित्य स्वरूप, संकल्पना २. विज्ञान साहित्याची वैशिष्ट्ये व वेगळेपण ३. विज्ञान साहित्याचा विकास व वाटचाल	१५	१
विभाग 2 Module II	१. साहित्यिक जयंत नारळीकर जीवन परिचय व वाङ्मयीन कार्य २. प्रेषित : आशयसूत्रे ३. प्रेषित : घटनाप्रसंग व व्यक्तिचित्रणे	१५	१
विभाग 3 Module III	१. प्रेषित : भाषाशैली, निवेदनपद्धती ३. प्रेषित : वातावरण निर्मिती ४. प्रेषित : विशेष आणि वाङ्मयीन मूल्यमापन	१५	१
विभाग 4 Module IV	१. वैज्ञानिक चित्रपट परीक्षण २. वैज्ञानिक ललित लेख	१५	१

संदर्भ ग्रंथसूची :

अ) मूलभूत वाचन

१. प्रेषित – जयंत नारळीकर

२. विज्ञान साहित्य आणि संकल्पना – संपा. डॉ. व. दि. कुलकर्णी, निरंजन घाटे

३. विज्ञान कथा : स्वरूप आणि समीक्षा – संपा. विश्वेश्वर सावदेकर

४. विज्ञानसाहित्यविश्व – संपा. निरंजन घाटे

५. मराठी विज्ञान साहित्य – संपा. म.सु. पगारे, सु.म. तडकोडकर

६. मराठी कथा प्रवृत्ती आणि प्रवाह – संपा. डॉ. रा.गो. चावरे

७. मराठी वाङ्मयाचा इतिहास – (खंड सातवा - भाग २) संपा. महाराष्ट्र साहित्य परिषद

८. Science Fiction in Illustrated Encyclopaedia, Ed. John Clute, Dorlin, Kindersley ,Londen. 1995

९ विज्ञान साहित्य संशोधन : एक आव्हान – उषा देशमुख (युगवाणी, मे जून १९८५)

१०. मराठी विज्ञान कविता - उषा देशमुख (युगवाणी, जून. १९८५)

११. मराठी विज्ञान साहित्याची दिशा – यशवंत पाठक (युगवाणी, मे. जून. १९८५)

ब) पूरक वाचन

- १) विज्ञानातील गमतीजमती – ब.मो. कानिटकर.
- २) यक्षाची देणगी – जयंत नारळीकर
- ३) विप्लवा – अरुण साधू
- ४) उडती तबकडी – भा.रा. भागवत
- ५) बालचंद्र- डी.ब. मोकाशी.
- ६) ऐशी रत्ने मेळवीन – नारायण धारप.
- ७) कालगुंफा - नारायण धारप
- ८) चिरंजीव – बाळ फोंडके
- ९) दुसरा आईसस्टाईन – लक्ष्मण लोंढे
- १०) संगणकाची सावली – सुबोध जावडेकर

Choice Based Credit System Syllabus - Marathi
June, 2020 onwards Class : B. A. III

Discipline Specific Core (DSC) : MARATHI Course
विद्याशाखीय विशेष गाभा (DSC) सत्र - सहावे मराठी अभ्यासपत्रिका क्र. १२
आधुनिक व पाश्चात्य काव्यशास्त्र

- CO 1- आधुनिक व पाश्चात्य काव्यशास्त्राची ओळख करून देणे.
CO 2 - आधुनिक काव्याची लक्षणे, प्रयोजने आणि काव्यानंद समजावून देणे.
CO 3 - साहित्याची निर्मितीप्रक्रिया आणि स्वरूप यांची ओळख करून देणे.
CO 4 - भाषेतील वृत्तांची ओळख करून देणे.

विभाग/ Module	Topic	Teaching Hours	Credit
विभाग 1 Module I	काव्यलक्षण <ul style="list-style-type: none"> ▪ अँरिस्टॉटल ▪ हॅजलिट ▪ कोलरिज ▪ एडगर अँलन पो ▪ वर्डस्वर्थ ▪ कार्लाईल 	१५	१
विभाग 2 Module II	काव्यप्रयोजन <ul style="list-style-type: none"> ▪ पलायनवाद ▪ स्वप्नरंजन/इच्छापूती ▪ जिज्ञासापूती ▪ उदबोधन ▪ आत्माविष्कार ▪ जीवनांनुभूती 	१५	१
विभाग 3 Module III	काव्यानंद मीमांसा <ul style="list-style-type: none"> ▪ क्रीडानंद - हर्बर्ट स्पेन्सर ▪ समधातता – आय. ए. रिचर्ड्स ▪ भावना विरेचन – अँरिस्टॉटल ▪ पुनःप्रत्यय – ना. सी. फडके ▪ प्रत्याभिज्ञा – कृ. पा. कुलकर्णी ▪ संवाद विरोध समतोल – बा. सी. मर्ढेकर 	१५	१
विभाग 4 Module IV	वृत्त <ul style="list-style-type: none"> ▪ भुजंगप्रयात ▪ वसंततिलका ▪ आर्या ▪ दिंडी ▪ सुनीत 	१५	१

संदर्भग्रंथ सूची

१. अभिनव काव्यप्रकाश – रा. श्री. जोग
२. काव्यशास्त्रप्रदीप – स. रा. गाडगीळ
३. भारतीय साहित्यशास्त्र – ग. त्र्यं. देशपांडे
४. सुलभ काव्यशास्त्र – पं. महादेवशास्त्री जोशी
५. काव्यशास्त्र परिचय – शिवशंकर उपासे
६. सुगम मराठी व्याकरण – मो. रा. वाळिंबे
७. जास्वंद - माधव आचवल

Choice Based Credit System Syllabus – Marathi

June 2020 Onwards

Class : B. A. III

Discipline Specific Core (DSC) : MARATHI Course

विद्याशाखीय विशेष गाभा (DSC) सत्र -६

मराठी अभ्यासपत्रिका क्र. १३ मराठी भाषा आणि व्याकरण

- CO 1 - मराठी भाषेचा उगमकाळ, प्राचीनत्व व जनक भाषेविषयी माहिती करून देणे.
- CO 2 - मराठीवर इतर भाषांचा झालेला प्रभाव सांगणे .
- CO 3 - मराठी भाषा व तिच्या संलग्न बोलीविषयी परिचय करून देणे .
- CO 4 - मराठी भाषेचे व्याकरण व प्रयोगविचार समजावून देणे.

विभाग/ Module	प्रकरण/Topic	Teaching Hours	श्रेयांक/ Credit
विभाग 1 Module I	१) मराठीचा उगमकाळ - महाराष्ट्र व मराठी भाषा उगमाबाबत प्राचीन ग्रंथातर्गत पुरावे - शिलालेख व ताम्रपट - वैद्य – गुणे वाद	१५	१
विभाग 2 Module II	२) मराठीची जनक भाषा -वेदपूर्व भाषा, जनक भाषेविषयी मते -मराठीची पूर्वपीठीका - संस्कृत, प्राकृत, अपभ्रंश, -अंतरवर्तुळ-बहिर्वर्तुल सिद्धांत	१५	१
विभाग 3 Module III	३. मराठीतील बोलीभाषांचा अभ्यास -प्रमाणभाषा व बोली - वऱ्हाडी बोली आणि खानदेशी बोली - कोकणी, डांगी आणि हळबी बोली	१५	१
विभाग 4 Module IV	४. भाषेचे व्याकरण- प्रयोग विचार -कर्तरी प्रयोग, कर्मणी प्रयोग, -भावे प्रयोग, संकीर्ण प्रयोग	१५	१

संदर्भ ग्रंथसूची :

आ) मूलभूत वाचन

१. आधुनिक भाषाविज्ञान - डॉ. कल्याण काळे, डॉ. अंजली सोमण
२. भाषाशास्त्र विचार - र. बा. मंचरकर
३. आधुनिक भाषाविज्ञान आणि मराठी भाषा - डॉ. दादा गोरे
४. मराठीचे वर्णनात्मक भाषाविज्ञान - डॉ. महेंद्र सुदाम कदम
५. मराठी भाषा उगम आणि विकास - कृ.पा. कुलकर्णी.
६. भाषाविज्ञान आणि मराठी भाषा - अनिल गवळी, हिरण्यकेशी पब्लिकेशन, कोल्हापूर
७. सुबोध भाषाशास्त्र- प्र. न. जोशी.
८. भाषाविज्ञान परिचय-(संपा.) डॉ.सुलक्षणा कुलकर्णी, डॉ. वसंत कुबेर
९. आधुनिक भाषाविज्ञान : सिद्धांत आणि उपयोजन - मिलिंद मालशे
१०. भाषा आणि भाषाशास्त्र - श्री. न .गजेद्रगडकर
११. शास्त्रीय मराठी व्याकरण - मो. के. दामले
१२. सुगम मराठी व्याकरण - मो. रा. वाळिंबे
१३. मराठी व्याकरण परिचय - राजशेखर हिरेमठ

ब) पूरक वाचन

१. मराठीचा भाषिक अभ्यास - मु.श्री. कानडे
२. भाषाविज्ञान वर्णनात्मक व ऐतिहासिक -(संपा) मालसे, इनामदार, सोमण
३. भाषा इतिहास आणि भूगोल - ना. गो. कालेलकर
४. मराठी भाषा वाढ आणि विचार - श्री. के. क्षीरसागर
५. मराठीचे वर्णनात्मक भाषाविज्ञान - महेंद्र कदम
६. शुद्धलेखन विवेक - द .न .गोखले

क) संदर्भ ग्रंथ

१. भाषा आणि संस्कृती - ना. गो. कालेलकर
२. मराठी लेखन कोश - यास्मीन शेख
३. ध्वनीविचार- ना .गो. कालेलकर
४. A course in Morden linguistics, oxford Newyark 1958
५. Brower Reuben (ED).On Translation (या ग्रंथातील On linguistic Apects of Translation हा Roman Jakobsn चा लेख) Lobov William : The Social Motivation of a sonrd change

Choice Based Credit System Syllabus – Marathi

June 2020 Onwards

Class : B. A. III

Discipline Specific Core (DSC) : MARATHI Course

विद्याशाखीय विशेष गाभा (DSC) सत्र – ६

मराठी अभ्यासपत्रिका क्र. १४

मराठी वाङ्मयाचा इतिहास (पंडिती काव्य ते बखर वाङ्मय)

CO 1 - मध्ययुगीन कालखंडातील वाङ्मयीन परंपरा, रचनाप्रकार व ग्रंथाकारांची माहिती करून देणे .

CO 2 - मध्ययुगीन कालखंडातील वाङ्मयनिर्मितीच्या प्रेरणांचा व सांस्कृतिक पार्श्वभूमीचा उलगडा करणे.

CO 3 - मध्ययुगीन कालखंडातील प्रमुख साहित्य प्रवाह व ग्रंथनिर्मिती याचा अनुबंध स्पष्ट करणे.

CO 4 - मध्ययुगीन काळातील मराठी भाषेचे स्वरूप स्पष्ट करणे.

विभाग/ Module	प्रकरण/Topic	Teaching Hours	श्रेयांक/ Credit
विभाग 1 Module I	१. पंडिती काव्य : स्वरूप, वर्गीकरण, वैशिष्ट्ये २. मुक्तेश्वर, वामन पंडित, रघुनाथ पंडित, ३. श्रीधर, निरंजन माधव, मोरोपंत	१५	१
विभाग 2 Module II	१. शाहिरी काव्य : स्वरूप, वर्गीकरण, वैशिष्ट्ये २. शाहीर अनंत फंदी, परशुराम, राम जोशी, ३. प्रभाकर, सगन भाऊ, होनाजी बाळा	१५	१
विभाग 3 Module III	१. बखर वाङ्मय स्वरूप व वर्गीकरण, वैशिष्ट्ये २. शिवपुर्वकालीन व शिवकालीन बखरी ३. पेशवेकालीन बखरी	१५	१
विभाग 4 Module IV	४. लोककला – १) वासुदेव २) वाघ्या मुरळी ५. लोकनाट्य तमाशा – १) बतावणी २) वग	१५	१

संदर्भ ग्रंथसूची :

अ) मूलभूत वाचन

- १.मराठी वाङ्मयाचा इतिहास खंड - १ ते ३ महाराष्ट्र साहित्य परिषद, पुणे
- २.प्राचीन मराठी वाङ्मयाचा इतिहास - खंड १ ते ४ - डॉ. अ. ना. देशपांडे
- ३.प्राचीन मराठी वाङ्मयाचा इतिहास - ल. रा. नसिराबादकर
- ४.प्राचीन मराठी वाङ्मयाचे स्वरूप - ह. श्री. शेणोलीकर
- ५.प्राचीन मराठी वाङ्मयाचा इतिहास - खंड १ व २ - ल. रा. पांगारकर
- ६.संत पंत आणि तंत - श्री म. माटे

ब) पूरक वाचन

१. संत एकनाथ दर्शन - संपा. डॉ. हे. वि. इनामदार
२. पाचभक्ती संप्रदाय - र.रा. गोसावी
३. संत वाङ्मयाची सामाजिक फलश्रुती - गं. . बा. सरदार
४. महाराष्ट्रीय संतमंडळाचे ऐतिहासिक कार्य - बा. र. सुंखठणकर
५. ज्ञानदेव आणि नामदेव - शं. दा. पेंडसे
६. मराठी बखर - र. वि. हेरवाडकर
७. मराठी शाहिरी पोवाडा - डॉ. विश्वनाथ शिंदे
८. पैजण - संपा. म. ना. अदवंत
९. मराठी काव्यातील शिवदैवत दर्शन - डॉ. शिवशंकर उपासे
१०. एकनाथांची निवडक भारुडे - संपा. वसंत जोशी
११. आज्ञापत्र - संपा. विलास खोले

संदर्भ ग्रंथ

- १.सर्वात्मभावी तुकाराम - डॉ. अनिल गवळी
- २.श्री. नामदेव दर्शन - संपा. नि. धो. मिरजकर
- ३.संत नामदेव - डॉ. हे. वि. इनामदार
- ४.पाच संतकवी - डॉ. शं. गो. तुळपुळे
- ५.वारकरी संप्रदाय : उदय व विकास भा. प. भहिरट
- ६.संत साहित्य संदर्भ कोश - मु. श्री. कानडे
- ७.मराठी साहित्याचे आदिबंध - उषा देशमुख
- ८.जनाबाईचे निवडक अभंग - सुहासिनी इलेंकर

Choice Based Credit System Syllabus - Marathi
June, 2020 onwards
Class : B. A. III

Discipline Specific Core (DSC) : MARATHI Course
 विद्याशाखीय विशेष गाभा (DSC) सत्र - सहावे मराठी अभ्यासपत्रिका क्र. १५
मराठी भाषा : सर्जन आणि उपयोजन

- CO 1 - औपचारिक आणि अनौपचारिक क्षेत्रांनुसार भाषिक व्यवहार समजावून देणे.
 CO 2 - विविध क्षेत्रातील भाषिक कौशल्ये आणि क्षमता विकसित करणे .
 CO 3 - उपयोजित व सर्जनशील लेखनास विद्यार्थ्यांना उद्युक्त करणे .
 CO 4 - जनसंपर्क कौशल्यांची आवश्यकता व तंत्रे समजावून देणे.

विभाग/ Module	Topic	Teaching Hours	Credit
विभाग 1 Module I	रेडिओ (नभोवाणी) <ul style="list-style-type: none"> • रेडिओ माध्यमाचे स्वरूप • रेडिओ : कार्यक्रम संहिता लेखन • रेडिओ जॉकी (R. J.) : भाषाकौशल्ये 	१५	१
विभाग 2 Module II	टेलिव्हीजन (टी. व्ही.) <ul style="list-style-type: none"> • टेलिव्हीजन माध्यमाचे स्वरूप • टेलिव्हीजन : दैनंदिन मालिका लेखन • टेलिव्हीजन : जाहिरात लेखन 	१५	१
विभाग 3 Module III	वेब <ul style="list-style-type: none"> • ब्लॉग (गद्य लेखन) • पॉडकास्ट (ऑडिओ क्लिप्स) • व्लाग : दृक-श्राव्य सादरीकरण (व्हिडिओ क्लिप्स) 	१५	१
विभाग 4 Module IV	सर्जनशील लेखन <ul style="list-style-type: none"> • रेडिओसाठी भाषण • ब्लॉग लेखन 	१५	१५

संदर्भग्रंथ सूची

१. सृजनात्मक लेखन – आनंद पाटील
२. रूपनिरूपण – शिरीष गोपाळ देशपांडे
३. वाङ्मय : अध्ययन आणि प्रकार – संपा. मिलिंद मालशे
४. मराठी भाषा : उपयोजन आणि सर्जन - संपा. अनिल गवळी
५. भाषिक सर्जनशीलता - स्वरूप आणि प्रकार - यशवंतराव चव्हाण मुक्त विद्यापीठ, नाशिक प्रकाशन.
६. साहित्याची निर्मितीप्रक्रिया - आनंद यादव

Choice Based Credit System Syllabus – Marathi

June 2020 Onwards

Class : B. A. III

Discipline Specific Core (DSC) : MARATHI Course

विद्याशाखीय विशेष गाभा (DSC) सत्र – ६

मराठी अभ्यासपत्रिका क्र. १६ वाडमय प्रवाहाचे अध्ययन (पर्यावरण साहित्य)

साहित्यकृती - एका रानवेड्याची शोधयात्रा - कृष्णमेघ कुंटे

CO 1 - मराठीतील विविध साहित्य प्रवाहाचा परिचय करून देणे.

CO 2 - प्रवासवर्णन, भटकंती यातील साहित्यप्रकारचा परिचय करून देणे .

CO 3 - पर्यावरण साहित्याची ओळख, प्रवाह, प्रेरणा, स्वरूप, वैशिष्ट्ये व विकास समजावून देणे .

CO 4 - अभ्यासासाठी नेमलेल्या साहित्यकृतीद्वारे संबधित साहित्य प्रकाराचे आकलन करून देणे.

विभाग/ Module	Topic	Teaching Hours	श्रेयांक/ Credit
विभाग 1 Module I	१. पर्यावरण साहित्य स्वरूप, संकल्पना २. पर्यावरण साहित्याची वैशिष्ट्ये व वेगळेपण ३. पर्यावरण साहित्याचा विकास व वाटचाल	१५	१
विभाग 2 Module II	१. साहित्यिक कृष्णमेघ कुंटे, जीवनपरिचय व वाडमयीन कार्य २. एका रानवेड्याची शोधयात्रा : आशयसूत्रे ३. एका रानवेड्याची शोधयात्रा : घटनाप्रसंग, स्थलवर्णने	१५	१
विभाग 3 Module III	१. एका रानवेड्याची शोधयात्रा : भाषाशैली, २. एका रानवेड्याची शोधयात्रा : निवेदनपद्धती ३. एका रानवेड्याची शोधयात्रा : वाडमयीन मूल्यमापन	१५	१
विभाग 4 Module IV	१. पर्यावरण अभ्यास : माहितीलेखन, पर्यावरणीय अनुभव कथन २. पर्यावरण प्रदूषण : माहितीपटाचे परीक्षण	१५	१

संदर्भ ग्रंथसूची :

अ) मूलभूत वाचन

१. १९६० नंतरची सामाजिक स्थिती व साहित्यातील नवे प्रवाह – आनंद यादव
२. निळी पहाट – रा. ग. जाधव (श्री विद्या)
३. लेखणीच्या तलवारी – कुसुम आलाम
४. मराठी साहित्य : आकलन आणि आस्वाद – विश्वनाथ शिंदे
५. बदलते मराठी साहित्य व संस्कृती – विलास रणसुंभे
६. साहित्यातील विचारधारा - के. र. शिरवाडकर
७. चिंतनाच्या वाटा – निर्मलकुमार फडकुले
८. मराठी वांगडमयाचा इतिहास (खंड सातवा – भाग पहिला) – संपा.महाराष्ट्र साहित्य परिषद
९. कला म्हणजे काय – साने गुरुजी,
१०. साहित्य आणि इतर ललित कला – दु.का.संत
११. शोभायात्रा – शफाअत खान, पाँपूलर प्रकाशन,मुंबई

ब) पूरक वाचन

१. गोपुरांच्या प्रदेशात – गंगाधर गाडगीळ
२. माझा प्रवास - विष्णूभट गोडसे
३. धुक्यातून लाल ता-याकडे – अनंत काणेकर
४. नवे जग नवी क्षितिजे - प्रभाकर पाध्ये
५. अपूर्वाई – पु.ल. देशपांडे
- ६.ताकोनामा – प्रभाकर पाध्ये
- ७.बर्फाच्या दुनियेत – चारुशीला गुप्ते
- ८.माझा रशियाचा प्रवास – अण्णाभाऊ साठे
९. जंगलातील दिवस – व्यंकटेश माडगुळकर
१०. कलावंतांचे आनंदपर्यटन – ग. दि. माडगुळकर

Pattern of Question Paper

प्रश्नपत्रिकेचे स्वरूप

एकू गुण - ४०

			गुण
प्र.१	अ	योग्य पर्याय निवडा	०५
	ब	एका वाक्यात उत्तरे लिहा.	०५
प्र.२		विभाग १ वर दीर्घोत्तरी प्रश्न (दोन पैकी एक)	०८
प्र.३		विभाग २ वर दीर्घोत्तरी प्रश्न (दोन पैकी एक)	०८
प्र.४		विभाग ३ वर दीर्घोत्तरी प्रश्न (दोन पैकी एक)	०८
प्र.५		विभाग ४ वर लघुत्तरी प्रश्न (दोन पैकी एक)	०६

* अंतर्गत मूल्यमापनाचे स्वरूप

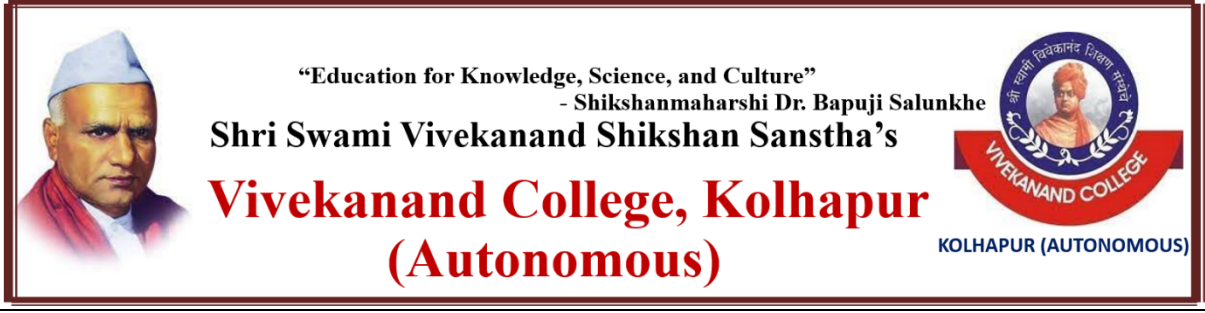
गुण - १०

1) गृहपाठ (Home Assignment)

०५

2) शोधप्रकल्प (Research Project)

०५



Department of English (2020-21)

B. A. Part III (Special English)



SYLLABUS

CHOICE BASED CREDIT SYSTEM

To be implemented from June 2020

**BA-III (Sem-V and VI)
Structure**

Paper No.	Course code	Title of paper	No. of Credits
Semester V			
AECC	AECC-1017	AECC -English for Communication	4
VII	DSE -1017 E1	Introduction to Literary Theory and Criticism	4
VIII	DSE-1017 E2	English Literature : Chaucer to Romanticism	4
IX	DSE- 1017E3	English Literature :Victorian to Post Modernism	4
X	DSE- 1017 E4	Introduction to Translation Studies	4
XI	DSE- 1017 E5	Linguistics	4
SEC	SEC-AE	Research Methodology	2
Semester VI			
AECC	AECC -1017	AECC -English for Communication	4
XI	DSE -1017 E1	Introduction to Literary Theory and Criticism	4
XIII	DSE- 1017 F2	English Literature : Chaucer to Romanticism	4
XIV	DSE- 1017 F3	English Literature :Victorian to Post Modernism	4
XV	DSE- 1017 F4	Introduction to Translation Studies	4
XVI	DSE- 1017 F5	Linguistics	4
SEC	SEC-AF	Research Methodology	2

CHOICE BASED CREDIT SYSTEM
B.A. III (Special English)
DSE: Introduction to Literary Theory and Criticism
Paper IX
Semester V

Course Outcomes:

On completion of the course, students will be able to:

CO1: Comprehend literary terminology from Aristotle down to Victorian times.

CO2: Exhibit a broad and coherent body of knowledge in the area of literary criticism.

CO3: Demonstrate in-depth knowledge of the critical texts.

SYLLABUS

Modules	Sub-units	Teachin g Hours	No. of Credits
Module I	Classical criticism (Aristotle: Imitation, Catharsis, Hamartia)	15	1
Module II	Neoclassical Criticism An Apologie for Poetrie by Sir Philip Sydney	15	1
Module III	Romantic Criticism (S.T. Coleridge : Fancy and Imagination)	15	1
Module VI	Victorian Criticism The Function of Criticism at the Present Time by Matthew Arnold	15	1

Semester VI

Course Outcomes:

On completion of the course, students will be able to:

CO1: Understand the key concept of the modern criticism with the help of prescribed text.

CO2: Demonstrate an understanding of key concepts in Feminism.

CO3: Engage with Indian Aesthetic theory such as Rasa.

CO4: Get equipped to attempt practical criticism of poems.

SYLLABUS

Modules	Sub-units	Teaching Hours	No. of Credits
ModuleV	Modern Criticism (T. S. Eliot : Objective Correlative, Dissociation of sensibility)	15	1
ModuleVI	Feminism (Basic Concepts)	15	1
ModuleVII	Indian Criticism (Rasa theory: What is Rasa? Types of Rasa's)	15	1
ModuleVIII	Practical Criticism	15	1

References:

1. Abrams . M.H .A Glossary of Literary Terms (8thEdition) .New Delhi : Akash Press ,2007
2. Bolt, C. The Women's Movements in the United States and Britain from the 1790s to the 1920s .New York and London : Harvester Wheatsheaf
3. Bywater, Ingram. Aristotle's Poetics .Oxford: At the Clarendon Press, 1976.

4. Hudson ,W.H. An Introduction to the Study of Literature .New Delhi : Atlantic ,2007.(Chapter No.6)
5. Wimsatt ,W.K and Cleanth Brooks .Literary Criticism A Short History . New Delhi : Oxford and IBH
6. Aristotle' , Poetics, translated with an introduction and notes by Malcolm Heath, (London: Penguin, 1996) chaps. 6-17, 23, 24, and 26.
7. Plato, The Republic, Book X, tr. Desmond Lee (London: Penguin, 2007).
8. Horace, ArsPoetica, tr. H. Rushton Fairclough, Horace: Satires, Epistles and ArsPoetica (Cambridge Mass.: Harvard University Press, 2005) pp. 451-73

Division of Teaching Hours: 4 Modules X 15 Hours each = 60

Continuous Internal Evaluation

Evaluation Type	Marks
Home Assignment/ Open Book Test/Tutorial/ Unit Test	10

Semester End Examination

Pattern of Question Paper

Marks: 40 marks

Time: 2 hour

Que. No	Sub. Q.	Types of Question	Based on	Marks
Q.1	A	Multiple choice questions with four alternatives.	All Modules	5
	B	Answer the following questions in one word/phrase/sentence each.	All Modules	5
Q.2	A	Answer the questions in about 250-300 words each	Module I, II, III	10
	B	Answer the questions in about 250-300 words each	Module I, II, III	10
Q.3	A	Critical appreciation of the given poem	Module IV	10

CHOICE BASED CREDIT SYSTEM

DSE-1017 E2

Paper VIII: English Literature: Chaucer to Romanticism

Semester V

Course Outcomes: On completion of the course, students will be able to:

CO1: Get acquainted with the concept of Classicism in literature.

CO2: Understand Renaissance literature.

CO3: Understand the structure of Elizabethan Theatre.

CO4: Understand the salient characteristics of various types of Drama.

CO5: Identify the salient features of English of the given period.

SYLLABUS

Modules	Sub-units	Teaching Hours	No. of Credits
Module I	Literary Movements Classicism Renaissance literature	15	1
Module II	English Drama: Origin and Development Different types of Drama Miracle and Morality Elizabethan Drama Restoration Tragedy	15	1
Module III	All for Love: John Dryden	15	1
Module IV	Prose: Francis Bacon - Of Studies, Oliver Goldsmith - Man in Black Richard Steele -Recollections of childhood Charles Lamb : A Dissertation upon Roasted Pig Hazlitt - On the Love of Life	15	1

Paper XIII: English Literature: Chaucer to Romanticism

DSE- 1017 F2

Semester VI

Course Outcomes:

On completion of the course, students will be able to:

CO1: Know the literary movements of Romanticism.

CO2: Recognize the features of metaphysical poetry.

CO3: Realize the origin, development and various types of novel and analysis of romantic novel *Pride and Prejudice*.

CO4: Analysis of romantic poetry.

SYLLABUS

Modules	Sub-units	Teaching Hours	No. of Credits
Module V	Literary Movements Metaphysical Poetry Romanticism	15	1
Module VI	English Novel: Origin and development Types of Novel: Picaresque Novel, Historical Novel, Regional Novel	15	1
Module VII	Jane Austin: <i>Pride and Prejudice</i>	15	1
Module VIII	Poetry John Milton - On His Blindness John Donne : Death be not proud George Herbert: Love(III) Samuel Taylor Coleridge: Kubla Khan John Keats - To Autumn P.B. Shelley- Ode to the West Wind	15	1

References :

1. Guide to English Literature. Ed. Boris Ford. Vol1 .The Age of Chaucer English Literature in Context. Paul Poplawski. Cambridge UP, 2008 .
2. Routledge History of Literature in English. Ronald Carter & John Mc Rae. London: Routledge, 1997
3. John Richetti. Cambridge Companion to the Eighteenth Century Novel. Cambridge Univ. Press
4. Wilbur L Cross. Development Of The English Novel
5. Roe, Nichole: Romanticism. Oxford University Press.
6. Wolfson, Susan J. Cambridge Companion to Keats. Cambridge University Press.
7. Fraser, George Sutherland: John Keats: Odes: A Casebook. Macmillan.
8. Robinson, Daniel: A Century of Sonnets: The Romantic Era Revival. Oxford University Press.

Division of Teaching Hours: 4 Modules X 15 Hours each = 60

Continuous Internal Evaluation

Evaluation Type	Marks
Home Assignment/ Open Book Test/Tutorial/ Unit Test	10

**Semester End Examination
Pattern of Question Paper**

Marks: 40 marks

Time: 2 hour

Que. No	Sub. Q.	Types of Question	Based on	Marks
Q.1	A	Multiple choice questions with four alternatives.	All Modules	5
	B	Answer the following questions in one word/phrase/sentence each.	All Modules	5
Q.2	A	Answer the questions in about 250-300 words each	Module I and II	10
	B	Answer the questions in about 250-300 words each	Module III and IV	10
Q.3	A	Write short notes on the following: (Any 2 out of 4)	All Module	10

CHOICEBASEDCREDITSYSTEM

B.A.III Special English

Paper IX: English Literature: Victorian to Post modernism

DSE- 1017E3

Semester V

Course Outcomes: On completion of the course, students will be able to:

CO1: Explain the origins, salient features and major examples of literary movements –Neo-classicism and Realism.

CO2: Discuss the development of English drama in modern and post-modern age.

CO3: Identify and comment on the salient features of Drama of Ideas and Theatre of Absurd.

CO4: Appreciate the text “The Doctor’s Dilemma” and comment on the prescribed essays from literary point of view.

SYLLABUS

Modules	Sub-units	Teaching Hours	No. of Credits
Module V	Literary Movements Neoclassicism Realism	15	1
Module VI	English Drama: Development - Modern and post-modern drama Types: -Drama of Ideas -The Problem Play -Theatre of Absurd)	15	1
Module VII	G B Shaw: <i>The Doctor's Dilemma</i> (1906)	15	1
Module VIII	Text : G. K. Chesterton - What I Found in My Pocket Lynd -A Disappointed Man A. G. Gardiner - All About a Dog J. B. Priestley - On Gossip A. A. Milne -The Future Orwell: Shooting an Elephant	15	1

Paper XIV: English Literature :Victorian to Post Modernism

DSE- 1017 F3

Semester VI

Course Outcomes:

On completion of the course, students will be able to:

CO1: Explain the origins, salient features and major examples of literary movements – Naturalism and Symbolism

CO2: Discuss the development of English drama in modern and post-modern age

CO3 Identify and comment on the salient features of pastoral novel, campus fiction and science Fiction

CO4: Appreciate the text *Tess of the D'Urbervilles* and prescribed poems.

SYLLABUS

Modules	Sub-units	Teaching Hours	No. of Credits
Module V	Literary Movements Naturalism Symbolism	15	1
Module VI	English Novel: Development- Modern and post-modern Types of Novel: -Pastoral Novel, -Campus Fiction, -Science Fiction	15	1
Module VII	Thomas Hardy: <i>Tess of D'Urbervilles</i>	15	1
Module VIII	Poetry Tennyson - The Lady of Shallot Thomas Hardy : The Darkling Thrush Robert Browning - My Last Duchess Matthew Arnold : Dover Beach' W.B. Yeats : Second Coming Wilfred Owen : Strange Meeting Dame Edith Sitwell: Still Falls the Rain Dylan Thomas: Do not go gentle	15	1

Reference:

1. Collins, Thomas J. *The Broadview Anthology of Victorian Poetry and Poetic Theory: Concise Edition*, Broadview Press, 2000
2. *Modern English Playwrites: A Short History of English Drama*, John William Cunliff, Harper and Brothers, 1927.
3. Shaw, Bernard. *The Doctor's Dilemma*, Orient Black Swan, 1956.
4. *The Cambridge Companion to Modernist Novel*, Cambridge University Press, 2007
5. Thomas Hardy: *Tess of D'Urbervilles*, Classy Publishing 2021
6. Chesterton, G. K. *The Victorian Age in Literature*, Open Road Media Publishert, 2015

Division of Teaching Hours: 4 Modules X 15 Hours each = 60

Continuous Internal Evaluation

Evaluation Type	Marks
Home Assignment/ Open Book Test/Tutorial/ Unit Test	10

Semester End Examination

Pattern of Question Paper

Marks: 40 marks

Time: 2 hour

Que. No	Sub. Q.	Types of Question	Based on	Marks
Q.1	A	Multiple choice questions with four alternatives.	All Modules	5
	B	Answer the following questions in one word/phrase/sentence each.	All Modules	5
Q.2	A	Answer the questions in about 250-300 words each	Module I and II	10
	B	Answer the questions in about 250-300 words each	Module III and IV	10
Q.3	A	Write short notes on the following: (Any 2 out of 4)	All Module	10

Paper X: Introduction to Translation Studies

DSE- 1017 E4

Semester V

Course Outcomes: On completion of the course, students will be able to:

CO1: Master the theoretical knowledge relating to translation.

CO2: Develop an expertise in their working languages in the practice of translation.

CO3: Identify different problems of translation and try to solve them.

CO4: Acquire the skills required as a professional translator.

SYLLABUS

Modules	Sub-units	Teaching Hours	No. of Credits
Module I	What is translation? Significance of translation in a multi linguistic and multicultural society like India.	15	1
Module II	Tools of translation (cognitive: command over source and target language, language and grammar, language and society, language and culture)(Non-cognitive : dictionaries, encyclopedia, machine, graphics, indices)	15	1
Module III	Theories of interpretation Interpreting : (a) in terms of formal structure: Grammar & Mimamsa (b) in terms of context (c) in terms of Intention (d) in terms of Culture (e) in terms of Purpose	15	1
Module IV	Translation of Non-literary texts	15	1

Paper XV: Introduction to Translation Studies

DSE- 1017 F4

Semester VI

Course Outcomes: On completion of the course, students will be able to:

CO1: Develop expertise in their working languages in the practice of translation.

CO2: Translate literary text with the help of tools of translation.

CO3: Understand the ways to promote themselves as a professional translator.

CO4: Find solutions to solve problems of translation.

SYLLABUS

Modules	Sub-units	Teaching Hours	No. of Credits
Module I	Types / modes of translation: Semantic / Literal translation 2. Free / sense/ literary translation 3. Functional / communicative translation 4. Technical / Official 5. Trans-creation 6. Audio-visual translation	15	1
Module II	Structure of Language: Broad acquaintance with (a) Structure of English (b) Structure of Marathi (c) Structure of Hindi Contrastive Methods Phrase Structure Idiomatic Expression Language Universal	15	1
Module III	Problems of Translation 1.General Problems Incompetence Ambiguity Cultural Gap Structural difference Idiomatic difference 2.Language -specific Problems Idioms 3. Contextual Meaning	15	1
Module IV	Translation of Prose & Poetry	15	1

References:

1. Translation Studies - Susan Bassnett
2. Introducing Translation Studies: Theories and Applications - Jeremy Munday
3. Routledge Encyclopaedia of Translation Studies - Mona Baker
4. A Textbook of Translation (Skills)- Peter Newmark (Translation And Translating: Theory And Practice -Roger T. Bell
5. MOOC : <https://nptel.ac.in/courses/109/104/109104050/>

Continuous Internal Evaluation

Evaluation Type	Marks
Home Assignment/ Open Book Test/Tutorial/ Unit Test/ Project	10

Semester End Examination Pattern of Question Paper

Marks: 40 marks

Time: 2 hour

Que. No	Sub. Q.	Types of Question	Based on	Marks
Q.1	-	Multiple choice questions with four alternatives.	Module V, VI, and VII	5
Q.2	-	Answer the questions in about 250-300 words each	Module V, VI, and VII	08
Q.3	-	Write short notes (Any 2 out of 4)	Module V, VI, and VII	10
Q.4	-	Translate the text from Marathi to English	Module VIII	10
Q.5	-	Translate the text from English to Marathi	Module VIII	10

Paper XI: Linguistics

DSE- 1017 E5

Semester V

Course Outcomes

On completion of the course, students will be able to:

CO1: Understand and explore the meanings of an expression using terms of syntax.

CO2: Comprehend and define intended meaning in language use.

CO3: Understand, describe and explain the ways of discourse and text analysis within the framework of Pragmatics

CO4: Do discourse analysis of the given text.

SYLLABUS

Modules	Sub-units	Teaching Hours	No. of Credits
Module I	Introduction to Semantics (Definition and Nature)	15	1
Module II	Introduction to Pragmatics (Definition and Nature)	15	1
Module III	Concept of Discourse (mode, tone, domain) (unity, Cohesion, coherence)	15	1
Module IV	Discourse Analysis	15	1

DSE: Linguistics
Paper XVI DSE- 1017 F5
Semester VI

Course Outcomes:

On completion of the course, students will be able to

CO1: Apply the acquired skills (linguistic cultural, research, critical, synthetic) to other disciplines.

CO2: Understand, analyse and study the Ambiguous nature of language.

CO3: Get acquainted with grammatical patterns especially variations of order and stylistic transformations.

CO4: Identify variety of language used in the given text.

SYLLABUS

Modules	Sub-units	Teaching Hours	No. of Credits
Module V	Syntax: Sentence Connection, Substitutions and Ellipses	15	1
Module VI	Ambiguity	15	1
Module VII	Focused Emphasis	15	1
Module VIII	Language variations	15	1

References:

1. Austin, John I., 1962. *How to Do Things with Words*. Oxford: Oxford University Press.
2. Carnie, Andrew. 2012. *Syntax: A Generative*

Introduction. Vol.19. John Wiley and Sons.

3. Fromkin, V., Rodman, R., and Hyams, N. 2013. *An Introduction to Language*. Cengage Learning.
4. Leech, G. N., 1981. *Semantics*. Harmondsworth : Penguin
5. Leech, G. N., 1983. *Principles of Pragmatics*. London: Longman.
6. Searle, John R. 1979. *Expression and Meaning: Studies in the Theory of Speech Acts*. Cambridge: Cambridge University Press.
7. Kleiser Grenville, *The Art of Writing*, A P H, New Delhi, 2011 4
8. Leech Geoffrey, Deuchar Margaret and Hoogenraad Robert, *English Grammar for Today: A New Introduction*. London, Macmillan, 1973
9. Quirk, R. and Greenbaum, S. *A University Grammar of English*, Longman 1973
10. Swan, Michael and Catherine Walker. (n-date). *The Good Grammar Book*.
Oxford: Oxford University Press
11. Trimble John R., *Writing with Style, Conversations on the Art of Writing*, Prentice Hall, New Jersey, 1975
12. Callies, M. (2002). Information structure and discourse-pragmatics in German

Continuous Internal Evaluation

Evaluation Type	Marks
Home Assignment/ Open Book Test/Tutorial/ Unit Test/Project	10

Semester End Examination Pattern of Question Paper

Marks: 40 marks

Time: 2 hour

Que. No	Sub. Q.	Types of Question	Based on	Marks
Q.1	-	Multiple choice questions	All Modules	5
Q.2	-	Do as directed.	Module V	15
Q.3	-	Short Notes	Module VI & VIII	10
Q.4.	-	Practical question	Module VII	10

“ज्ञान, विज्ञान और सुसंस्कार इसलिए शिक्षा प्रसार”

-शिक्षणमहर्षि डॉ. बापूजी साळुंखे

श्री स्वामी विवेकानंद शिक्षण संस्था संचलित
विवेकानंद कॉलेज, कोल्हापुर (स्वायत्त)



हिंदी विभाग

तृतीय वर्ष कला शाखा

सत्र – V, VI

पाठ्यक्रम

Choice Based Credit System

शैक्षिक वर्ष 2020-2021

विवेकानंद कॉलेज (स्वायत्त), कोल्हापुर
हिंदी विभाग

वर्ष 2020-2021

तृतीय वर्ष कला शाखा

सत्र – V प्रश्नपत्र – VII

विधा विशेष का अध्ययन

DISIPLINE SPECIFIC ELECTIVE COURSE (DSC)

(Course Code – DSC-1016 E1)

हिंदी (ऐच्छिक)

श्रेयांक – 04, तासिकाएँ – 60

(प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (CBCS) के आलोक में किया गया है।)

उद्देश्य :-

1. उपन्यास और आत्मकथा साहित्य से परिचित कराना।
2. उपन्यासकार संजीव के व्यक्तित्व एवं कृतित्व को समझाना।
3. पाँव तल की दूब उपन्यास में चित्रित आदिवासी एवं पर्यावरणवादी विमर्श का अध्ययन कराना।
4. काव्य के नवीन विधाओं से परिचित कराना।
5. मराठी से हिंदी में साहित्य के अनुवाद प्रक्रिया से परिचित कराना।
6. कुर्सी पहियोंवाली आत्मकथा की प्रासंगिकता से अवगत कराना।
7. छात्रों की विचार क्षमता तथा सर्जनात्मकता को बढ़ावा देना।

अध्यापन पद्धति :-

1. व्याख्यान तथा विश्लेषण।
2. साहित्यकोश के माध्यम से।
3. दृक-श्रव्य साधनों/माध्यमों का प्रयोग।
4. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
5. पी. पी. टी., आई. सी. टी. तथा भाषा प्रयोगशाला का प्रयोग।
6. विशेषज्ञों के व्याख्यान, साक्षात्कार तथा प्रश्नावली।

पाठ्यपुस्तक

पाँव तले की दूब (उपन्यास) – संजीव

वागर्थ प्रकाशन, आग्रा।

अध्ययनार्थ विषय :-

इकाई (Module)	पाठ्यक्रम (Syllabus)	अध्यापन तासिका (Teaching Hours)	श्रेयांक (Credits)
इकाई 1	संजीव का जीवन परिचय, व्यक्तित्व, कृतित्व एवं उपन्यासकार संजीव का सामान्य परिचय।	15	1
इकाई 2	पाँव तले की दूब— कथावस्तु एवं शीर्षक की सार्थकता।	15	1
इकाई 3	पाँव तले की दूब— पात्र एवं चरित्र—चित्रण, संवाद, देशकाल वातावरण।	15	1
इकाई 4	पाँव तले की दूब— भाषा शैली एवं उद्देश्य।	15	1

प्रश्नपत्र का स्वरूप एवं अंक विभाजन :-

अंक

प्रश्न 1 : अ) पूरे पाठ्यक्रम पर पाँच बहुविकल्पी प्रश्न	05
ब) एक वाक्य में उत्तर लिखिए (पूरे पाठ्यक्रम पर पाँच प्रश्न)	05
प्रश्न 2 : पूरे पाठ्यक्रम पर ससंदभ प्रश्न (3 में से 2)	10
प्रश्न 3 : पूरे पाठ्यक्रम पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)	10
प्रश्न 4 : पूरे पाठ्यक्रम पर टिप्पणी प्रश्न (अंतर्गत विकल्प के साथ)	10

कुल अंक – 40

❖ अंतर्गत मूल्यमापन – होम असायमेंट और विभागीय मूल्यमापन अंक— 10

सत्र : VI

विशेष ऐच्छिक प्रश्नपत्र – XII : विधा विशेष का अध्ययन

(Course Code – DSC-1016 F1)

पाठ्यपुस्तक

कुर्सी पहियोंवाली (आत्मकथा) – नसीमा हुरजूक ।

अनुवाद– डॉ. गिरीश काशिद और डॉ. चंदा गिरीश ।

राजकमल प्रकाशन, नयी दिल्ली ।

➤ अध्ययनार्थ गद्यपाठ :-

अ.क्र. इकाई (Module)	पाठ्यक्रम (Syllabus)	अध्यापन तासिका (Teaching Hours)	श्रेयांक (Credits)
इकाई 1	नसीमा हुरजूक का जीवन परिचय, व्यक्तित्व, कृतित्व एवं आत्मकथाकार का सामान्य परिचय ।	15	1
इकाई 2	कुर्सी पहियोंवाली– कथावस्तु एवं शीर्षक की सार्थकता ।	15	1
इकाई 3	कुर्सी पहियोंवाली– पात्र एवं चरित्र–चित्रण, संवाद, देशकाल वातावरण ।	15	1
इकाई 4	कुर्सी पहियोंवाली– भाषा शैली एवं उद्देश्य ।	15	1

प्रश्नपत्र का स्वरूप एवं अंक विभाजन :-

अंक

प्रश्न 1 : अ) पूरे पाठ्यक्रम पर पाँच बहुविकल्पी प्रश्न

05

ब) एक वाक्य में उत्तर लिखिए (पूरे पाठ्यक्रम पर पाँच प्रश्न)

05

प्रश्न 2 : पूरे पाठ्यक्रम पर ससंदर्भ प्रश्न (3 में से 2)

10

प्रश्न 3 : पूरे पाठ्यक्रम पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 4 : पूरे पाठ्यक्रम पर टिप्पणी प्रश्न (अंतर्गत विकल्प के साथ)

10

कुल अंक –

40

❖ अंतर्गत मूल्यमापन – होम असायमेंट और विभागीय मूल्यमापन अंक– 10

• **संदर्भ ग्रंथ :-**

1. पॉव तले की दूब (उपन्यास) – संजीव, वागर्थ प्रकाशन, आग्रा।
2. कुर्सी पहियोंवाली (आत्मकथा) – नसीमा हुरजूक। अनुवाद— डॉ. गिरीश काशिद और डॉ. चंदा गिरीश। राजकमल प्रकाशन, नयी दिल्ली।
3. कथाकार संजीव – डॉ. शहीजहाँन मणेर।

विवेकानंद कॉलेज (स्वायत्त), कोल्हापुर
हिंदी विभाग

वर्ष 2020-2021

तृतीय वर्ष कला शाखा

सत्र – V प्रश्नपत्र – VIII

साहित्यशास्त्र

DISIPLINE SPECIFIC ELECTIVE COURSE (DSC)

(Course Code – DSC-1016 E2)

हिंदी (ऐच्छिक)

श्रेयांक – 04, तासिकाएँ – 60

(प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (CBCS) के आलोक में किया गया है।)

उद्देश्य :-

1. साहित्य के निर्मिति प्रक्रिया का बोध कराना।
2. काव्य के विभिन्न अंगों, भेदों से परिचित कराना।
3. काव्य के नवीन विधाओं से परिचित करना।
4. शब्दशक्तियों से परिचित कराना।
5. रस के विभिन्न अंगों को समझाना।
6. काव्य सिद्धांतों से परिचित कराना।
7. छात्रों की विचार क्षमता तथा सर्जनात्मकता को बढ़ावा देना।

अध्यापन पद्धति :-

1. व्याख्यान तथा विश्लेषण।
2. सस्वर काव्य पाठ, प्रकट वाचन, संवाद।
3. साहित्यकोश के माध्यम से।
4. दृक-श्रव्य साधनों/माध्यमों का प्रयोग।
5. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
6. पी. पी. टी., आई. सी. टी. तथा भाषा प्रयोगशाला का प्रयोग।
7. विशेषज्ञों के व्याख्यान, साक्षात्कार तथा प्रश्नावली।

अध्ययनार्थ विषय :-

इकाई (Module)	पाठ्यक्रम (Syllabus)	अध्यापन तासिका (Teaching Hours)	श्रेयांक (Credits)
इकाई 1	काव्य- परिभाषा, स्वरूप, तत्व, प्रयोजन, प्रेरणा	15	1
इकाई 2	शब्दशक्ति- परिभाषा, प्रकार	15	1
इकाई 3	रस- परिभाषा, स्वरूप, अंग, भेद	15	1
इकाई 4	अलंकार- शब्दालंकार- अनुप्रास अलंकार, श्लेश अलंकार, यमक अलंकार, वक्रोक्ति अलंकार। अर्थालंकार- उपमा अलंकार, रूपक अलंकार, उत्प्रेक्षा अलंकार, अतिशयोक्ति अलंकार।	15	1

प्रश्नपत्र का स्वरूप एवं अंक विभाजन :-

अंक

प्रश्न 1 : अ) पूरे पाठ्यक्रम पर पाँच बहुविकल्पी प्रश्न

05

ब) एक वाक्य में उत्तर लिखिए (पूरे पाठ्यक्रम पर पाँच प्रश्न)

05

प्रश्न 2 : इकाई एक और दो पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 3 : इकाई तीन और चार पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 4 : पूरे पाठ्यक्रम पर टिप्पणी प्रश्न (अंतर्गत विकल्प के साथ)

10

कुल अंक -

40

❖ अंतर्गत मूल्यमापन - होम असायमेंट और विभागीय मूल्यमापन अंक- 10

सत्र : VI**विशेष ऐच्छिक प्रश्नपत्र – XIII : साहित्यशास्त्र और आलोचना**

(Course Code – DSC-1016 F2)

➤ अध्ययनार्थ गद्यपाठ :-

अ.क्र. इकाई (Module)	पाठ्यक्रम (Syllabus)	अध्यापन तासिका (Teaching Hours)	श्रेयांक (Credits)
इकाई 1	महाकाव्य के भारतीय तथा पाश्चात्य तत्व प्रगीत- स्वरूप और भेद गज़ल- स्वरूप और प्रमुख अंग	15	1
इकाई 2	नाटक- भारतीय और पाश्चात्य तत्व उपन्यास- परिभाषा, तत्व, प्रकार आत्मकथा- परिभाषा और तत्व	15	1
इकाई 3	आलोचना- स्वरूप, आलोचक के गुण आलोचना के प्रकार- सैद्धांतिक आलोचना मार्क्सवादी आलोचना संरचनावादी आलोचना सौंदर्यवादी आलोचना	15	1
इकाई 4	छंद मात्रिक छंद- दोहा छंद, सोरठा छंद, रोला छंद, चौपाई छंद । वर्णिक छंद- सवैया छंद, मालिनी छंद, मंदाक्रांता छंद, इंद्रव्रजा छंद ।	15	1

प्रश्नपत्र का स्वरूप एवं अंक विभाजन :-**अंक**

प्रश्न 1 : अ) पूरे पाठ्यक्रम पर पाँच बहुविकल्पी प्रश्न

05

ब) एक वाक्य में उत्तर लिखिए (पूरे पाठ्यक्रम पर पाँच प्रश्न)

05

प्रश्न 2 : इकाई एक और दो पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 3 : इकाई तीन और चार पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 4 : पूरे पाठ्यक्रम पर टिप्पणी प्रश्न (अंतर्गत विकल्प के साथ)

10

कुल अंक –**40****❖ अंतर्गत मूल्यमापन – होम असायमेंट और विभागीय मूल्यमापन अंक– 10**

• संदर्भ ग्रंथ :-

1. काव्यशास्त्र- भगीरथ मिश्र।
2. शास्त्रीय समीक्षा के सिद्धांत- डॉ. गोविंद त्रिगुणायत।
3. काव्य के रूप- बाबू गुलाबराय।
4. भारतीय काव्यशास्त्र के सिद्धांत- डॉ. कृष्णदेव झारी।
5. भारतीय काव्यशास्त्र- डॉ. मानवेंद्र पाठक।
6. हिंदी आलाचना के बीज शब्द- डॉ. बच्चन सिंह।

विवेकानंद कॉलेज (स्वायत्त), कोल्हापुर
हिंदी विभाग

वर्ष 2020-2021

तृतीय वर्ष कला शाखा

सत्र – V प्रश्नपत्र – IX

हिंदी साहित्य का इतिहास

DISIPLINE SPECIFIC ELECTIVE COURSE (DSC)

(Course Code – DSC-1016 E3)

हिंदी (ऐच्छिक)

श्रेयांक – 04, तासिकाएँ – 60

(प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (CBCS) के आलोक में किया गया है।)

उद्देश्य :-

1. हिंदी भाषा तथा साहित्य की विकास यात्रा से अवगत कराना।
2. हिंदी साहित्य की विकास यात्रा में हिंदी भाषा के माध्यम से अलग-अलग विचारधारा और प्रवृत्तियों से अवगत कराना।
3. छात्रों में साहित्य समझने तथा उसका अस्वादन, मूल्यांकन करने की दृष्टि को बढ़ाना।
4. छात्रों को साहित्य के संदर्भ में विभिन्न साहित्यिक विधाओं विकास क्रम से परिचित कराना।
5. छात्रों को युगीन सामाजिक, राजनीतिक परिस्थितियों के परिप्रेक्ष्य में हिंदी से अवगत कराना।
6. इतिहासकारों द्वारा प्रस्तुत काल विभाजन और नामकरण को जानने के लिए प्रेरित करना।
7. हिंदी साहित्य के अंतर्गत गद्य-पद्य विधा और उसके भेदों, उपभेदों से अवगत कराना।
8. आदिकाल से लेकर आधुनिक काल तक के संत, महात्मा, लेखक, कवियों की विचारधारा और उनके द्वारा निर्मित साहित्य का सामान्य परिचय कराना।

अध्यापन पद्धति :-

1. व्याख्यान तथा विश्लेषण।
2. साहित्यकोष के माध्यम से।
3. दृक-श्रव्य साधनों/माध्यमों का प्रयोग।
4. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
5. पी. पी. टी., आई. सी. टी. तथा भाषा प्रयोगशाला का प्रयोग।
6. विशेषज्ञों के व्याख्यान, साक्षात्कार तथा प्रश्नावली।

अध्ययनार्थ विषय :-

इकाई (Module)	पाठ्यक्रम (Syllabus)	अध्यापन तासिका (Teaching Hours)	श्रेयांक (Credits)
इकाई 1	साहित्येतिहास लेखन: अर्थ एवं स्वरूप। इतिहास लेखन की परंपरा। इतिहास लेखन की पद्धतियाँ। इतिहास लेखन की उपयोगिता।	15	1
इकाई 2	आदिकाल का नामकरण आदिकाल की परिस्थितियाँ- सामाजिक, राजनीतिक आदिकालीन साहित्य की सामान्य विशेषताएँ आदिकाल के रचनाकार- 1. खुसरो। 2. चंदबरदाई।	15	1
इकाई 3	भक्तिकाल भक्तिकाल की परिस्थितियाँ- सामाजिक, राजनीतिक निर्गुण काव्य की विशेषताएँ सगुण काव्य की विशेषताएँ भक्तिकाल के प्रतिनिधि कवि- कबीर, जायसी, सूरदास, तुलसीदास	15	1
इकाई 4	रीतिकाल का नामकरण रीतिकाल की परिस्थितियाँ- सामाजिक, राजनीतिक रीतिकाल की विशेषताएँ। रीतिकाल की काव्यधाराएँ- 1. रीतिबद्ध 2. रीतिसिद्ध 3. रीतिमुक्त।	15	1

प्रश्नपत्र का स्वरूप एवं अंक विभाजन :-

अंक

प्रश्न 1 : अ) पूरे पाठ्यक्रम पर पाँच बहुविकल्पी प्रश्न

05

ब) एक वाक्य में उत्तर लिखिए (पूरे पाठ्यक्रम पर पाँच प्रश्न)

05

प्रश्न 2 : इकाई एक और दो पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 3 : इकाई तीन और चार पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 4 : पूरे पाठ्यक्रम पर टिप्पणी प्रश्न (अंतर्गत विकल्प के साथ)

10

कुल अंक -

40

❖ अंतर्गत मूल्यमापन - होम असायमेंट और विभागीय मूल्यमापन अंक- 10

सत्र : VI

विशेष ऐच्छिक प्रश्नपत्र – XIV : हिंदी साहित्य का इतिहास

(Course Code – DSC-1016 F3)

➤ अध्ययनार्थ गद्यपाठ :-

इकाई (Module)	पाठ्यक्रम (Syllabus)	अध्यापन तासिका (Teaching Hours)	श्रेयांक (Credits)
इकाई 1	आधुनिककालीन पृष्ठभूमि- सामाजिक, राजनीतिक, सांस्कृतिक। भारतेंदु युग की विशेषताएँ। द्विवेदी युग विशेषताएँ।	15	1
इकाई 2	हिंदी काव्य की विभिन्न धारा और उनकी विशेषताएँ- छायावाद प्रगतिवाद समकालीन कविता		
इकाई 3	आधुनिक गद्य विधाओं का विकास हिंदी उपन्यास साहित्य का उद्भव और विकास हिंदी कहानी साहित्य का उद्भव और विकास हिंदी नाटक साहित्य का उद्भव और विकास	15	1
इकाई 4	साहित्यिक विमर्श- 1. स्त्री विमर्श। 2. दलित विमर्श। 3. आदिवासी विमर्श। 4. पर्यावरणीय विमर्श।	15	1

प्रश्नपत्र का स्वरूप एवं अंक विभाजन :-

अंक

प्रश्न 1 : अ) पूरे पाठ्यक्रम पर पाँच बहुविकल्पी प्रश्न

05

ब) एक वाक्य में उत्तर लिखिए (पूरे पाठ्यक्रम पर पाँच प्रश्न)

05

प्रश्न 2 : इकाई एक और दो पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 3 : इकाई तीन और चार पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 4 : पूरे पाठ्यक्रम पर टिप्पणी प्रश्न (अंतर्गत विकल्प के साथ)

10

कुल अंक -

40

• अंतर्गत मूल्यमापन - होम असायमेंट और विभागीय मूल्यमापन अंक- 10

• संदर्भ ग्रंथ :-

1. हिंदी साहित्य का इतिहास- आ. रामचंद्र शुक्ल ।
2. हिंदी साहित्य का इतिहास- डॉ. नगेंद्र ।
3. हिंदी साहित्य का दूसरा इतिहास- डॉ. बच्चन सिंह ।
4. कबीर- आ. हजारीप्रसाद द्विवेदी ।
5. हिंदी साहित्य: युग और प्रवृत्तियाँ-
6. हिंदी साहित्य का इतिहास: नए विचार नई दृष्टि- डॉ. रमेशकुमार जैन ।
7. हिंदी साहित्य का इतिहास- डॉ. गंगासहाय प्रेमी ।

विवेकानंद कॉलेज (स्वायत्त), कोल्हापुर
हिंदी विभाग

वर्ष 2020-2021

तृतीय वर्ष कला शाखा
सत्र – V प्रश्नपत्र – X
प्रयोजनमूलक हिंदी

DISIPLINE SPECIFIC ELECTIVE COURSE (DSC)

(Course Code – DSC-1016 E4)

हिंदी (ऐच्छिक)

श्रेयांक – 04, तासिकाएँ – 60

(प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (CBCS) के आलोक में किया गया है।)

उद्देश्य :-

1. हिंदी में कार्य करने की रुचि को विकसित करना।
2. रोजगार उन्मुख शिक्षा एवं कौशल्य प्रदान करना।
3. प्रिंट एवं दृक श्रव्य माध्यमों से परिचय कराना।
4. नव इलेक्ट्रानिक माध्यमों से परिचय कराना।
5. रोजगारपरक हिंदी की उपयोगिता स्पष्ट कराना।

अध्यापन पद्धति :-

1. व्याख्यान तथा विश्लेषण।
2. साहित्यकोष के माध्यम से।
3. दृक-श्रव्य साधनों/माध्यमों का प्रयोग।
4. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
5. पी. पी. टो., आई. सी. टी., इंटरनेट आदि का प्रयोग।

अध्ययनार्थ विषय :-

इकाई (Module)	पाठ्यक्रम (Syllabus)	अध्यापन तासिका (Teaching Hours)	श्रेयांक (Credits)
इकाई 1	प्रिंट मीडिया लेखन समाचार अर्थ एवं परिभाषा । समाचार लेखन के मूल तत्व । संपादन कला के सामान्य सिद्धांत । विज्ञापन लेखन के तत्व ।	15	1
इकाई 2	समाचार लेखन महाविद्यालयीन एवं सामाजिक समारोह का समाचार लेखन । छुर्घटना एवं प्राकृतिक आपदा का समाचार लेखन । विज्ञापन लेखन ।	15	1
इकाई 3	रेडियो मीडिया लेखन— वार्ता—वार्ताकन लेखन— स्वरूप, प्रविधि । फीचर लेखन— स्वरूप, प्रविधि । परिचर्चा लेखन— स्वरूप, प्रविधि ।	15	1
इकाई 4	रेडियो नाटक— स्वरूप, प्रविधि । विज्ञापन— स्वरूप, प्रविधि । रेडियो अभिवाचन— स्वरूप, प्रविधि ।	15	1

प्रश्नपत्र का स्वरूप एवं अंक विभाजन :-

अंक

प्रश्न 1 : अ) पूरे पाठ्यक्रम पर पाँच बहुविकल्पी प्रश्न

05

ब) एक वाक्य में उत्तर लिखिए (पूरे पाठ्यक्रम पर पाँच प्रश्न)

05

प्रश्न 2 : इकाई एक और दो पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 3 : इकाई तीन और चार पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 4 : पूरे पाठ्यक्रम पर टिप्पणी प्रश्न (अंतर्गत विकल्प के साथ)

10

कुल अंक —

40

● अंतर्गत मूल्यमापन — होम असायमेंट और विभागीय मूल्यमापन अंक— 10

सत्र : VI**विशेष ऐच्छिक प्रश्नपत्र – XV : प्रयोजनमूलक हिंदी****(Course Code – DSC-1016 F4)**

➤ अध्ययनार्थ गद्यपाठ :-

अ.क्र. इकाई (Module)	पाठ्यक्रम (Syllabus)	अध्यापन तासिका (Teaching Hours)	श्रेयांक (Credits)
इकाई 1	टेलीविजन लेखन- धारावाहिक लेखन- स्वरूप, प्रविधि। समाचार लेखन- स्वरूप, प्रविधि। चर्चा-परिचर्चा लेखन- स्वरूप, प्रविधि। साक्षात्कार लेखन- स्वरूप, प्रविधि।	15	1
इकाई 2	सिनेमा लेखन- पटकथा लेखन- स्वरूप, प्रविधि। संवाद लेखन- स्वरूप, प्रविधि। फिल्म समीक्षा लेखन- स्वरूप, प्रविधि।	15	1
इकाई 3	वेब संसाधन- ब्लॉग लेखन- स्वरूप, प्रकार, प्रविधि और ब्लाग। (साहित्यिक, पर्यावरण, सामाजिक, सिनेमा)	15	1
इकाई 4	हिंदी सॉफ्टवेअर- अर्थ, स्वरूप, प्रकार।	15	1

प्रश्नपत्र का स्वरूप एवं अंक विभाजन :-**अंक**

प्रश्न 1 : अ) पूरे पाठ्यक्रम पर पाँच बहुविकल्पी प्रश्न

05

ब) एक वाक्य में उत्तर लिखिए (पूरे पाठ्यक्रम पर पाँच प्रश्न)

05

प्रश्न 2 : इकाई एक और दो पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 3 : इकाई तीन और चार पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 4 : पूरे पाठ्यक्रम पर टिप्पणी प्रश्न (अंतर्गत विकल्प के साथ)

10

कुल अंक –**40**

- अंतर्गत मूल्यमापन – होम असायमेंट और विभागीय मूल्यमापन अंक– 10

• **संदर्भ ग्रंथ :-**

1. हिंदी : मीडिया और पत्रकारिता- सं. डॉ. आरिफ़ महात ।
2. मीडिया लेखन- सं. जशवंत राठवा ।
3. जन संचार एवं पत्रकारिता कल और आज- डॉ. सिद्राम कृष्णा खोत ।

विवेकानंद कॉलेज (स्वायत्त), कोल्हापुर
हिंदी विभाग

वर्ष 2020-2021

तृतीय वर्ष कला शाखा

सत्र – V प्रश्नपत्र – XI

भाषा विज्ञान एवं हिंदी भाषा

DISIPLINE SPECIFIC ELECTIVE COURSE (DSC)

(Course Code – DSC-1016 E5)

हिंदी (ऐच्छिक)

श्रेयांक – 04, तासिकाएँ – 60

(प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (CBCS) के आलोक में किया गया है।)

उद्देश्य :-

1. भाषा के विविध रूपों का परिचय कराना।
2. भाषा विज्ञान का सामान्य परिचय कराना।
3. हिंदी भाषा एवं लिपि के उद्भव और विकास का परिचय कराना।
4. भाषा के शुद्धता के प्रति छात्रों को जागृत कराना।
5. मानक हिंदी वर्तनी और व्याकरण से छात्रों को परिचित कराना।

अध्यापन पद्धति :-

1. व्याख्यान तथा विश्लेषण।
2. भाषा कोष के माध्यम से।
3. दृक-श्रव्य साधनों/माध्यमों का प्रयोग।
4. संगोष्ठी, स्वाध्याय तथा समूह चर्चा।
5. पी. पी. टी., आई. सी. टी., इंटरनेट आदि का प्रयोग।

अध्ययनार्थ विषय :-

इकाई (Module)	पाठ्यक्रम (Syllabus)	अध्यापन तासिका (Teaching Hours)	श्रेयांक (Credits)
इकाई 1	भाषा की परिभाषाएँ, भाषा की विशेषताएँ, भाषा की उत्पत्ति एवं तत्संबंधी विविध वाद- दैवी उत्पत्ति सिद्धांत, धातु सिद्धांत, अनुकरण सिद्धांत, श्रमपरिहारमूलक सिद्धांत।	15	1
इकाई 2	भाषा परिवर्तनशीलता के कारण। भाषा के विविध रूप- बोली, राजभाषा, संपर्क भाषा, विश्वभाषा। बोलियों के बनने के कारण। बोली और भाषा में अंतर।	15	1
इकाई 3	हिंदी भाषा का उद्भव और विकास, हिंदी शब्द समूह, हिंदी की बोलियाँ- अवधी, ब्रज, खड़ीबोली, भोजपुरी, मैथिली।	15	1
इकाई 4	लिपि विकास का सामान्य परिचय। देवनागरी लिपि की वैज्ञानिकता। हिंदी भाषा की मानक वर्तनी।	15	1

प्रश्नपत्र का स्वरूप एवं अंक विभाजन :-

अंक

प्रश्न 1 : अ) पूरे पाठ्यक्रम पर पाँच बहुविकल्पी प्रश्न	05
ब) एक वाक्य में उत्तर लिखिए (पूरे पाठ्यक्रम पर पाँच प्रश्न)	05
प्रश्न 2 : इकाई एक और दो पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)	10
प्रश्न 3 : इकाई तीन और चार पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)	10
प्रश्न 4 : पूरे पाठ्यक्रम पर टिप्पणी प्रश्न (अंतर्गत विकल्प के साथ)	10
कुल अंक -	40

- अंतर्गत मूल्यमापन - होम असायमेंट और विभागीय मूल्यमापन अंक- 10

सत्र : VI

विशेष ऐच्छिक प्रश्नपत्र – XVI : भाषा विज्ञान एवं हिंदी भाषा

(Course Code – DSC-1016 F5)

➤ अध्ययनार्थ गद्यपाठ :-

अ.क्र. इकाई (Module)	पाठ्यक्रम (Syllabus)	अध्यापन तासिका (Teaching Hours)	श्रेयांक (Credits)
इकाई 1	भाषा विज्ञान की परिभाषा। भाषा विज्ञान के अध्ययन का महत्त्व। भाषा विज्ञान की वैज्ञानिकता।	15	1
इकाई 2	भाषा विज्ञान के प्रधान अंगों का परिचय— ध्वनिविज्ञान, पदविज्ञान, शब्दविज्ञान, वाक्यविज्ञान, अर्थ विज्ञान।	15	1
इकाई 3	भाषा विज्ञान का अन्य विज्ञानों से संबंध— भाषा विज्ञान और साहित्य। भाषा विज्ञान और समाजविज्ञान। भाषा विज्ञान और व्याकरण। भाषा विज्ञान और मनोविज्ञान। भाषा विज्ञान और इतिहास। भाषा विज्ञान और भूगोल।	15	1
इकाई 4	व्याकरण	15	1

प्रश्नपत्र का स्वरूप एवं अंक विभाजन :-

अंक

प्रश्न 1 : अ) पूरे पाठ्यक्रम पर पाँच बहुविकल्पी प्रश्न

05

ब) एक वाक्य में उत्तर लिखिए (पूरे पाठ्यक्रम पर पाँच प्रश्न)

05

प्रश्न 2 : इकाई एक और दो पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 3 : इकाई तीन और चार पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)

10

प्रश्न 4 : पूरे पाठ्यक्रम पर टिप्पणी प्रश्न (अंतर्गत विकल्प के साथ)

10

कुल अंक –

40

● अंतर्गत मूल्यमापन – होम असायमेंट और विभागीय मूल्यमापन अंक– 10

● संदर्भ ग्रंथ :-

1. भाषा विज्ञान— डॉ. भोलानाथ तिवारी।
2. भाषा विज्ञान की भूमिका— डॉ. देवेन्द्रनाथ शर्मा।

3. भाषा विज्ञान के तत्त्व– डॉ. राजनारायन मौर्य ।
4. भाषा विज्ञान और हिंदी भाषा– डॉ. सुधीर कलवाडे ।
5. भाषा विज्ञान के सिद्धांत और हिंदी भाषा– डॉ. द्वारकाप्रसाद सक्सेना ।
6. हिंदी भाषा– डॉ. धीरेंद्र वर्मा ।
7. हिंदी व्याकरण– कामताप्रसाद गुरु ।
8. हिंदी की वर्तनी– कैलासचंद्र भाटिया, रचना भाटिया ।

“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha’s
Vivekanand College, Kolhapur
(Autonomous)**



DEPARTMENT OF POLITICAL SCIENCE

B.A. Part-III

Semester V, IV

**Under Choice Based Credit System
Syllabus with effect from the Academic Year 2020-21**

CHOICE BASED CREDIT SYSTEM
BA - III (Sem V and VI) Political Science
Course Structure

Paper No.	Course code	Title of paper	No. of Credits
Semester V			
VII	DSE - 1019 E 1	Contemporary Political Concepts	4
VIII	DSE - 1019 E 2	Public Administration	4
IX	DSE - 1019 E 3	International Politics	4
X	DSE - 1019 E 4	Political Ideologies	4
XI	DSE - 1019 E 5	Indian Political Thought - II A	4
SEC	SEC-AE	Legal Literacy	2
Semester VI			
XII	DSE - 1019 F 1	Comparative Political System	4
XIII	DSE - 1019 F2	Practice of Public Administration	4
XIV	DSE - 1019 F3	Indian Foreign Policy	4
XV	DSE - 1019 F4	Local Self-Government of Maharashtra	4
XVI	DSE - 1019 F5	Western Political Thought - II A	4
SEC	SEC-AF	Democratic Awareness	2

BA- III CBCS
Semester V Paper VII
Contemporary Political Concepts (DSE -1019E1)

COs: On completion of this course, students will be able to:

- 1) Discuss meaning, contents and four important concepts of contemporary Political Theory.
- 2) Appreciate the currents of thought within political concepts.
- 3) Interpret the issues of the day in the light of these concepts.
- 4) Appreciate the challenges of the modern world.

Modules	Syllabus	Teaching Hours	No. of Credits
Module 1	Human Rights a) Meaning, Nature and Characteristics b) Types of Human Rights, the Declaration of Human Rights c) India and Human Rights	15	1
Module 2	Feminism a) Meaning, Origin and Development b) Characteristics of Feminism c) Theories of Feminism: Liberal, Marxist, Radical	15	1
Module 3	Environmentalism a) Meaning and Nature, Consequences of Environmental Degradation b) Environment and Development, Environment and Human Rights c) Shallow Environmentalism and Deep Environmentalism	15	1
Module 4	Globalization a) Meaning and Nature, Major Characteristics b) Social, Economic and Political consequences of globalization c) Globalization and National Sovereignty, Critique of Globalization	15	1

--	--	--	--

Reference Books:

1. Baylis John and Steve Smith, Globalization of World Politics, Oxford.
2. Routledge Encyclopedia of Philosophy: www.rep.routledge.com
3. Heywood Andrew, Politics, Palgrave Publication.

BA III CBCS
Semester V Paper VIII
Public Administration (DSC -1019E2)

Course Outcomes: On completion of the course, students will be able to:

CO1: Explain important concepts of Public Administration.

CO2: Narrate the important structures of Public Administration.

CO3: Discuss the new trends in the discipline of administrative process.

CO4: Explain the structure and principles of organization.

Modules	Syllabus	Teaching Hours	No. of Credits
Module 1	Public Administration 1) Meaning, Definition and Nature 2) Scope and Importance 3) Politics and Administration	15	1
Module 2	Organization 1) Meaning, Definition and Bases 2) Principles: Hierarchy, Span of Control, Unity of Command, Centralization and Decentralization	15	1
Module 3	Elements of Organization and Public Corporations 1) Elements of Organization: Auxiliary Staff, Line Staff 2) Public Corporations: Meaning, Characteristics and Control 3) Privatization and Public-Private Partnership	15	1
Module 4	Changing Perspectives in Public Administration 1) Development Administration 2) Public Choice Approach 3) Scientific Management	15	1

References:

1. Dr. Awashti A and Maheshwari S. R., Public Administration, Laxmi Narayan Agarwal.
2. Sharma M. P., Public Administration in Theory and Practice, Kitab Mahal, Allahabad.
3. Basu R., Public Administration: Concepts and Theories, Sterling Publishers, New Delhi.
4. Chakraborty, Bidyut & Prakash Chand, Public Administration: From Government to Governance, Orient Black Swan, 2017.

BA III CBCS
Semester V Paper VIII

International Politics (DSC -1019E3)

Course Outcomes: On completion of the course, students will be able to:

CO1: Explain the approaches to the study of International Politic.

CO2: Narrate the thoughts of four important modern political thinkers.

CO3: Describe important international organizations and issues.

CO4: Describe international efforts for environmental protection.

Modules	Syllabus	Teaching Hours	No. of Credits
Module 1	International Politics 1) Meaning, Nature and Scope of International Politics 2) Approaches to the study of International Politics: Realist, Idealist	15	1
Module 2	National Power and Diplomacy 1) National Power: Definition, Elements of National Power 2) Diplomacy: Definition, Functions of Diplomat, Types of Diplomacy	15	1
Module 3	International Organizations 1) United Nations Organization: Aims and Objectives, Main Organs, Success and Failures, Future of UNO 2) Regional Organizations: SAARC, EU	15	1
Module 4	Contemporary International Politics 1) World Trade Organization 2) International Efforts for Protection of Environment	15	1

References:

1. Jackson and Sorenson, Introduction to International Relations, Oxford Publications.
2. Baylis John and Steve Smith, Globalization of World Politics, Oxford.

BA III CBCS
Semester V Paper X
Political Ideologies (DSE - 1019 E 4)

Course Outcomes: On completion of the course, students will be able to:

CO1: Comprehend the structure and content of the concept of 'ideology'.

CO2: Comment on the historical evolution of important ideologies in the world.

CO3: Appreciate the importance of ideologies in socio-economic and political struggles around us.

CO4: Explain the meaning of liberalism, socialism, fascism and nationalism.

Modules	Syllabus	Teaching Hours	Credits
Module 1	Liberalism 1) Meaning, Nature and Characteristics 2) Origin and Development of Liberalism: Classical, Modern or Neo- Classical	15	1
Module 2	Socialism 1) Meaning, Nature and Basic Principles 2) Types of Socialism: Fabian Socialism, State Socialism, Workers' Socialism, Occupational Socialism, Democratic Socialism	15	1
Module 3	Fascism 1) Meaning, Development and Causes of the Rise of Fascism 2) Philosophy of Fascism, Basic Principles or Characteristics	15	1
Module 4	Nationalism 1) Meaning, Definition and Elements 2) Types of Nationalism, Merits and Demerits of Nationalism	15	1

References:

1. Dahl Robert and Bruce Stinebrickner, Modern Political Analysis, Pearson.
2. Kaare Storm, Gabriel A. Almond and G. Bingham Powell Jr., Comparative Politics Today: A World View, Pearson.

BA III CBCS
Semester V Paper XI
Indian Political Thought - II (DSE - 1019 E 5)

Course Outcomes: On completion of the course, students will be able to:

CO1: Explain the thoughts of important political thinkers of Modern India.

CO2: Explain important concepts in modern Indian Political Thought.

CO3: Appreciate ideological strands present in formative years of modern India.

CO4: Compare the thoughts of important political thinkers of Modern India.

Modules	Syllabus	Teaching Hours	No. of Credits
Module 1	Mohandas Karamchand Gandhi 1) Satya, Ahimsa, Satyagraha 2) Concept of Swarajya 3) Gandhi's Concept of Religion 4) Theory of Trusteeship	15	1
Module 2	Pundit Jawaharlal Nehru 1) Democratic Socialism 2) Composite Nationalism 3) Secularism 4) Panchsheel and Non-alignment	15	1
Module 3	Dr. B. R. Ambedkar 1) Critique of Caste System 2) Social and Parliamentary Democracy 3) State Socialism 4) Views on Nationalism	15	1
Module 4	Manvendra Nath Roy 1) Thoughts on Marxism 2) Neo Humanism 3) Radical Democracy	15	1

References:

1. Pantham Thomas and Kenneth L. Deutsch, Political Thought in Modern India, SagePublication
2. Chakrabarty Bidyut and Pandey R. K. Modern Indian Political Thought, SagePublication
3. Singh M. P. Indian Political Thought-Themes and Thinkers, Pearson.

BA III CBCS
Semester V Paper SEC - I
Legal Literacy (SEC-AE)

Course Outcomes: On completion of the course students will be able to:

CO1: Explain the provisions of Rights to Information Act.

CO2: Explain the ways of using Right to Information Act.

CO3: Narrate the structure and jurisdiction of District and Sessions Court.

CO4: Discuss the alternate judicial mechanisms available to Indian citizens.

Modules	Syllabus	No. of Credits
Module 1	Right to Information 1) Provisions in the Law 2) Using the right to Information	1
Module 2	Judiciary 1) Judicial Process in the Lower Judiciary 2) Lok Adalat	1

References:

1. Indian Social Institute, New Delhi, Legal Literacy Series Booklets. Available in Hindi also.
2. Legal literacy: available amongst interdisciplinary courses on Institute of Life Long Learning (Delhi University) Virtual Learning Portal namely vle.du.ac.in
3. districts.ecourts.gov.in
4. <https://www.maharashtra.gov.in/1148/RTI-Act-2005>

BA III CBCS
Semester VI Paper XII
Paper XII: Comparative Political System (DSE - 1019 F 1)

Course Outcomes: On completion of the course, students will be able to:

CO1: Discuss the meaning and role of Political System.

CO2: Compare different systems of government.

CO3: Discuss the advantages and disadvantages of different political systems.

CO4: Explain the structure, functions and types of three wings of government.

Modules	Syllabus	Teaching Hours	No. of Credits
Module 1	Political System 1) Meaning, Definition and Characteristics of Political System 2) Functions of Modern Political System; Gabriel Almond's Approach 3) Modern Classifications of Political Systems: Totalitarian, Oligarchic, Democratic	15	1
Module 2	Unitary and Federal System of Government 1) Unitary Government - Meaning, Characteristics, Merits and Demerits 2) Unitary System of Government in England 3) Federal Government - Definition, Creation, Characteristics, Merits and Demerits; - American model of Federalism - Comparison of Unitary and Federal Systems	15	1
Module 3	Legislature 1) Definition, Characteristics, Unicameral and Bicameral Legislature (E.g.) 2) Functions of Legislature, Decline of Legislature	15	1
Module 4	Executive and Judiciary 1) Executive: Meaning, Definition, Types, Functions, Significance; Relation between the Legislature and the Executive 2) Judiciary: Meaning, Definition, Functions, Independence of Judiciary 3) Comparative study of structure of Judiciaries in different countries (England, USA)	15	1

References:

1. Johari J. C., New Comparative Government, Lotus Press

BA III CBCS
Semester VI Paper XIII
Practice of Public Administration (DSE - 1019 F 2)

Course Outcomes: On completion of the course, students will be able to:

CO1: Understand the important processes of Public Administration.

CO2: Narrate the important structures of Public Administration.

CO3: Appreciate new trends in administrative process.

CO4: Explain the financial administration.

Modules	Syllabus	Teaching Hours	Credits
Module 1	Personnel Administration 1) Recruitment - Method, Eligibility 2) Training: Meaning, Definition, Types, Methods 3) Promotion: Definition and Principles 4) Civil Services: Characteristics and Functions	15	1
Module 2	Financial Administration of India 1) Budget : Meaning, Definition and Types 2) Budgetary Process 3) Financial Committees: Public Accounts Committee, Estimates Committee	15	1
Module 3	Administration at work 1) Delegated Legislation: Meaning, Types, Reasons of Growth, Advantages and Disadvantages 2) Administrative Law: Origins, Scope, Reasons of Growth	15	1
Module 4	New Trends in Public Administration 1) Good Governance 2) People's Participation	15	1

References:

1. Dr. Awashti A and Maheshwari S. R., Public Administration, Laxmi Narayan Agarwal.
2. Sharma M. P., Public Administration in Theory and Practice, Kitab Mahal, Allahabad.
3. Basu R., Public Administration: Concepts and Theories, Sterling Publishers, New Delhi.

BA III CBCS
Semester VI Paper XIV
Indian Foreign Policy (DSE - 1019 F 3)

Course Outcomes: On completion of the course, students will be able to:

CO1: Narrate the evolution of India's Foreign Policy.

CO2: Discuss important issues in India's Foreign Policy.

CO3: Analyze the Foreign Policy of India.

CO4: Discuss the challenges before India's foreign policy.

Modules	Syllabus	Teaching Hours	Credits
Module 1	Foreign Policy 1) Meaning, Definition and Objectives 2) Determinants and Basic Principles of India's Foreign Policy 3) Evolution of India's Foreign Policy: Cold War and Post-Cold War Period	15	1
Module 2	India's Relations with Great Powers 1) India and United States of America 2) India and China	15	1
Module 3	India's Foreign Policy in the Region a) India- Pakistan Relations b) India's East Asia Policy	15	1
Module 4	Challenges before India's Foreign Policy a) International Trade Relations b) Migration and Indian Foreign Policy	15	1

References:

1. Ganguly Sumit, Indian Foreign Policy: Oxford India Short Introduction, Oxford Publication.
2. Behera Navnita Chadha (Ed.), India Engages the World: ICSSR Research Surveys and Explorations, Oxford Publication.
3. Dutt V. P., India's Foreign Policy since Independence, NBT, India, 2007.
4. Bajpai, Kanti, 'India and the World', in The Oxford Companion to Politics in India, Student Edition, Niraja Gopal Jayal & Pratap Bhanu Mehta (ed.), Latest Edition, Oxford University Press, pp. 521-541.
5. Kapur Devesh, 'International Migration and Paradox of India's Democracy' in

DiasporaDevelopment and Democracy, Oxford University Press, ND, 2010, pp
162-184

BA III CBCS
Semester VI Paper XV
Local Self-Government of Maharashtra (DSE - 1019 F 4)

Course Outcomes: On completion of the course, students will be able to:

CO1: Narrate the history of evolution of local self-government institutions in Maharashtra.

CO2: Tell the place of local self-government institutions in Indian Constitution.

CO3: Narrate the structure of rural and urban local self-government institutions.

CO4: Explain the importance of decentralization of power.

Modules	Syllabus	Teaching Hours	Credits
Module 1	Historical Background of Local Self Government Institutions 1) Collective Development Programme 2) Different Committees - Balwantrai Mehta Committee Vasantrao Naik Committee, L. N. Bongirwar Committee, P.B. Patil Committee	15	1
Module 2	Constitutional space of local self - governments 1) Indian Constitution and Panchayat Raj 2) 73 rd and 74 th Constitutional Amendment	15	1
Module 3	3. Rural local self-government institutions 1) Gram Panchayat 2) Panchayat Samiti 3) Zilla Parishad	15	1
Module 4	Urban local self-government institutions a) Nagar Panchayats b) Municipal Council c) Municipal Corporation	15	1

References:

1. Government of Maharashtra – Maharashtra Zilla Parishad and Panchayats Act 1961
2. Government of Maharashtra – Municipals Act 1965
3. Constitution of India

BA III CBCS
Semester VI Paper XVI
Western Political Thought - II (DSE - 1019 F 5)

Course Outcomes: On completion of the course, students will be able to:

CO1: Narrate the political thoughts four important moder Western thinkers.

CO2: Discuss important concepts in Western Political Thought.

CO3: Comment on modern political issues.

CO4: Explain the importance of decentralization of power.

Modules	Syllabus	Teachin g Hours	Credits
Module 1	Thomas Hobbes 1) Thoughts of Human Nature, State of Nature 2) Social Contract Theory and Origin of State 3) Thoughts on Sovereignty	15	1
Module 2	George William Fredrick Hegel a) Dialectical Materialism b) Philosophy about State c) Civil Society	15	1
Module 3	John Stuart Mill a) Theory of Utilitarianism b) Thoughts on Freedom c) Thoughts on Representative Democracy	15	1
Module 4	Karl Marx a) Theory of Historical Materialism b) Theory of Surplus Value c) Theory of Class Struggle d) Communist Society	15	1

References:

1. Jha Shefali, Western Political Thought: From Plato to Marx, Pearson.
2. Admas Ian and R W Dyson, Fifty Great Political Thinkers, Routledge.

BA III CBCS
SEMESTER VI SEC II
Democratic Awareness (SEC-AF)

Course Outcomes: On completion of the course, students will be able to:

CO1: Narrate structures and functions of Municipal Corporation.

CO2: Discuss the decision-making process in Municipal Corporation.

CO3: Narrate the citizens' participation in Ward committees.

CO4: Narrate the functions of Municipal Corporation.

Modules	Syllabus	No. of Credits
Module 1	Structure of Municipal Corporation 1) Various departments of Municipal Corporation	1
Module 2	Legislative Process 1) Citizens' Participation in Ward Committees	1

References:

1. Shaha Ghanashyam (Ed.), *Social Movements and the State*, Sage, New Delhi.
2. Deshpande, Rajeshwari, 'Social Movements in Crisis?', in *Indian Democracy: Meanings and Practices*, Rajendra Vora & Suhas Palshikar (ed.), Sage, New Delhi, 2003.
3. Baviskar, Amita, 'Social Movements' in *The Oxford Companion to Politics in India*, Student Edition, Niraja Gopal Jayal & Pratap Bhanu Mehta (Eds.), Oxford University Press. pp. 381-390

**BA Part III (Sem V &VI) Political Science
Evaluation Pattern
with effect from 2020-21**

Paper Number	Title of the paper	Course Code	Continuous Internal Evaluation Marks	Semester End Examination	Total Marks
Semester V					
VII	Contemporary Political Concepts	DSE - 1019 E 1	40	10	50
VIII	Public Administration	DSE - 1019 E 2	40	10	50
IX	International Politics	DSE - 1019 E 3	40	10	50
X	Political Ideologies	DSE - 1019 E 4	40	10	50
XI	Indian Political Thought - II A	DSE - 1019 E 5	40	10	50
	Democratic Governance B				
SEC	Legal Literacy	SEC- AE			
Semester VI					
XII	Comparative Political System	DSE - 1019 F 1	40	10	50
XIII	Practice of Public Administration	DSE - 1019 F2	40	10	50
XIV	Indian Foreign Policy	DSE - 1019 F3	40	10	50
XV	Local Self-Government of Maharashtra	DSE - 1019 F4	40	10	50
XVI	Western Political Thought - II A	DSE - 1019 F5	40	10	50
	Social and Political Movements in India B				
SEC	Democratic Awareness	SEC-AF			

**BA Part III (Sem V & VI) Political Science
Semester End Examination
Structure of Question Paper**

Total Marks: 40

Time: 2 hours

Question No.	Question pattern	Marks
Q.1	A) Select the right answer from the options given below. B) Answer in one sentence. / Match the pair.	5
Q.2	Answer the following question in detail. (Any 1)	10
Q.3	Answer the following question in detail. (Any 1)	10
Q.4	Write short notes. (Any 2)	10
	Total	35

**BA Part II (Sem III & IV) Political Science
Continuous Internal Evaluation (CIE)**

Evaluation Type	Marks
Seminar/ Student Project	10

SEC-AE and SEC-AF (Sem V and VI) Scheme of Teaching, Learning and Evaluation

1. These courses are of Self Study mode. The study material of the above courses will be made available on the departmental blog on the college website.
2. The examination will be of 50 marks having 25 MCQ questions.
3. Minimum 20 marks (40%) out of 50 are required for passing.
4. The duration of examination will be 60 minutes.
5. The examination will be conducted at the college level.
6. The degree will be awarded only after successful completion of these courses.

“Dissemination of Education for Knowledge, Science and Culture”

- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)**



DEPARTMENT OF SOCIOLOGY

B.A. Part - III

Semester- V & VI

SYLLABUS

Under Choice Based Credit System

Syllabus with effect from the Academic Year 2020 - 21

CHOICE BASED CREDIT SYSTEM

BA - III (Sem - V and VI) Sociology

Course Structure

to be implemented from 2020 - 21

Paper No.	Course code	Title of Paper	No. of Credits
SEM V			
VII	DSE-1021E1	Western sociological thinkers	4
VIII	DSE-1021E2	Methods of social research	4
IX	DSE-1021E3	Rural Sociology	2
X	DSE-1021E4	Urban Sociology	4
XI	DSE-1021E5	Political Sociology	4
SEC	AE	Research techniques I	2
SEM VI			
XII	DSE-1021F1	Indian sociological thinkers	4
XIII	DSE-1021F2	Methods of social research	4
XIV	DSE-1021F3	Indian Rural Society	2
XV	DSE-1021F4	Industrial Sociology	4
XVI	DSE-1021F5	Social Anthropology	4
SEC	AF	Research techniques II	2

BA. Part - III CBCS
Semester - V Paper- VII
WESTERN SOCIOLOGICAL THINKERES (DSE-1021E1)
Teaching Hours 60 Credits - 4

Course Outcomes: On completion of the course, student will be able to :

- CO 1: Understand the expansion of sociology in India.
- CO 2 : Explore the thought of western sociological thinkers.
- CO 3: Inculcate the new western Social and Ethical values.
- CO 4 : Understand the theories of western sociological thinkers.

Modules	WESTERN SOCIOLOGICAL THINKERES	Teaching Hours	Credits
Module I	AUGUSTE COMTE A) Law Of Three Stages B) Positivism C) Social Statics And Social Dynamics	15	1
Module II	EMILE DURKHEIM A) The Study Of Social Facts B) Theory Of Suicide C) Theory Of Religion	15	1
Module III	KARL MARX A) Dialectical Materialism B) Theory Of Class Conflict C) Theory Of Alienation	15	1
Module IV	MAX WEBER A) Theory Of Social Action B) Types Of Authority C) Theory Of Religion And Social Change	15	1

REFERENCE BOOKS :-

1. Abraham Francis Modern sociological Theory, Delhi Oxford University press,1982
2. Abraham Francis Sociological thought, Madras Macmillan,1991
3. Aron Raymond Main Currents In Sociological Thought, Vol.I & II
4. Harmondgrowth, Middlesex, Penguin Books,1967
5. Coser A. Lewis Masters of Sociological Thought 2nd edition, Rawat publications Jaipur 1996
6. Delaney Tim Contemporary Social Theory, Investigation and Application Nework :prentice Hall.2008
7. Haralambos & Holborn Sociology : Themes and Perspectives 7th edition Published by
8. Harper Collins Publishers Ltd.London W6 8JB 2008
9. Ritzer George Classical Sociological Theory, 4th edition, Nework, Mc-grawhill publication.1996

10. Turner Jonathan The structure of Sociological Theory,4th editon Rawat

BA. Part - III CBCS
Semester - V Paper- VIII
METHODS OF SOCIAL RESEARCH (DSE-1021E2)
Teaching Hours 60 Credits - 4

Course Outcomes : on completion of the course, student will be able to :

- CO 1: Understand the research techniques skills.
- CO 2 : Make awareness to increase research.
- CO 3: Apply various research techniques to eradicate societal problems.
- CO 4 : Understand the importance of social research.

Modules	METHODS OF SOCIAL RESEARCH	Teaching Hours	Credits
Module I	SCIENTIFIC SOCIAL RESEARCH A) Social Research : Meaning & Characteristics. B) Stages of Scientific Method C) Relation Between Theory and Fact	15	1
Module II	RESEARCH DESIGNS A) Descriptive B) Exploratory C) Experimental	15	1
Module III	HYPOTHESIS AND RESEARCHER A) Utility of Social Research B) Qualities of good Researcher. C) Obstacles to Social Research D) Hypothesis: Meaning and Sources	15	1
Module IV	Quantitative and Qualitative Research A) Quantitative Research : meaning and characteristics B) Qualitative Research: meaning and characteristics C) Importance of Quantitative and Qualitative Research	15	1

REFERENCE BOOKS :

1. Goode and Hatt Methods in Social Research, McGraw Hill Book Company, New York 1952.
2. PV. Young and Calvin F. Schmid Scientific social survey and research prentice hall of India Private Ltd. New Delhi, 1982
3. Hans Raj, Theory and Practice in Social, Research, Surjeet Publication 7, K. Kamalanagar Delhi, 1979.
4. Wikinson and Bhandarkar, Methodology and Technique of Social Research, Himalaya Publication
5. House Bombay - 1984.

6. Bajpai S. R. Methods of Social Survey and Research, George Allen and Unwin, 1967
7. Galtung John Theory and Methods of Social Research, George Allen and Unwin, 1967
8. R. N. Sharma Research Methods in Social Sciences, Media Promoters and Publishers Pvt. Ltd. 1983
9. R. K. Sharma Sciences, Media Promoters and Publishers Pvt. Ltd. Bombay, 1983
10. Bateille A & Encounter and Experience, Personal Accounts of Fieldwork, Vikas
11. Madam T. N. Publishing House, New Delhi, 1975
12. Bryman, Alan Quality and Quantity in Social Research, Unwin Hayman, London, 1988
13. Jayaram N. Sociology : Methods and Theory, Mcmillan Madras 1989
14. Kothari C. R. Research Methodology; Methods and Techniques, Willey Eastem,, Bangalore 1989
15. Punch, Keith Introduction to Social Research, Sage London 1988
16. Shipman, Martin The limitations of Social Research Sage London 1998

BA. Part - III CBCS
Semester - V Paper- IX
RURAL SOCIOLOGY (DSE-1021E3)
Teaching Hours 60 Credits - 4

Course Outcomes: On completion of the course, student will be able to :

- CO 1: Understand the culture of rural community in India.
 CO 2 : Make awareness about obstacles between rural development in India.
 CO 3: Create social awareness about women empowerment.
 CO 4 : Understand the basic concept of rural sociology.

Modules	RURAL SOCIOLOGY	Teaching Hours	Credits
Module I	RURAL SOCIOLOGY IN INDIA A) Nature of Rural Sociology in India B) Rural Sociology Subject matter C) Importance of Rural Sociology in India	15	1
Module II	RURAL SOCIAL STRUCTURE A) Rural Family: Nature and Change B)Caste System: Nature and Change C)Jajmani / Baluta System: Nature and Change	15	1
Module III	RURAL DEVELOPMENT AND CHANGE A)Green Revolution: Objective and Rural society effect B)Rural development Programme: 1) Community development programme - Nature and Consequences 2)Employment Guarantee Scheme (EGS) -Nature and Consequences	15	1
Module IV	CHALLENGES IN CONTEMPARY RURAL SOCIETY A) Drought problem. C) Farmer suicide D) Obstacle's and barriers in women development	15	1

REFERENCE BOOKS :-

1. Doshi S. L. & Jain P. C. Rural Sociology, Rawat Publication Jaipur, 2002.
2. Desai A. R. Rural Sociology in India, Popular Prakashan, Bombay (5th Edn) 1994.
3. Mukharji Radhakamal The Dynamics of Rural Society, A. C. Mukharji, Berlin 1957.

4. Desai A. R. Rural India in Transition, Popular, Bombay 1979.
5. Srinivas M. N. The Remembered village, Oxford University Press, Bombai 1978.
6. Beteille Andre Studies in Agrarian Social Structure, Oxford University Press, Delhi 1974.
7. Oommen T. K. Social Transformation in Rural India, Vikas Publication House, New Delhi 1984.
8. Joshi P. C. Land Reforms in India : Trends and Perspectives, Allied Publishers, Bombay 1978.
9. Dube S. C. Indian village

B.A. Part - III CBCS
Semester - V Paper- X
URBAN SOCIOLOGY (DSE-1021E4)
Teaching Hours 60 Credits - 4

Course Outcomes: On completion of the course, student will be able to :

- CO 1: Understand the culture of urban community in India.
- CO 2 : Know the differentiation between rural - urban community.
- CO 3: Make awareness to eradicate environmental pollution such as Air, Water, Soil pollution.
- CO 4 : Understand the concept of urbanization.

Modules	URBAN SOCIOLOGY	Teaching Hours	Credits
Module I	FIELD OF URBAN SOCIOLOGY A) Definition and Subject matter of Urban sociology B) Nature of Urban sociology C) Importance of the Study of Urban Sociology .	15	1
Module II	MAJOR CONCEPTS IN URBAN SOCIOLOGY A) Urban Community B) Urbanism C) Rural- Urban differences- continuum	15	1
Module III	Process of Urbanization A) Meaning and Nature of Urbanization B) Causes of Urbanization. C) Consequences of Urbanization	15	1
Module IV	URBAN SOCIAL PROBLEMS A) Housing and Slum B) Crime . C) Pollution . D) Population	15	1

REFERENCE BOOKS :-

1. Ramnath Sharma A Text book of Urban Sociology, Second Revised Edition, Rajhans Press publication, Mirat, U.P.
2. Rajendra K. Sharma, Urban Sociology, Atlantic Publishers and Distributors, New Delhi, 1997.
3. Wilson R.A. & Schlutz David, Urban Sociology, Prentice Hall, England, 1978
4. Rao M.S.A. Urban Sociology in India, Orient Longman, New Delhi, 1974
5. D. Souza Alfred The Indian city: Poverty Ecology and Urban Development, Manohar, New Delhi, 1978
6. Dube K. K. and Urban Environment in India, Inter India, New Delhi, 1988
7. Singh A.K. Mitra, Ashok et.al Indian cities, Abhinav, New Delhi, 1980
8. Bergel E.E. Urban Sociology, Free Press, New York, 1962

10. Bose, Ashish Studies in India's Urbanisation, Tata McGraw Hill, New Delhi, 1973
11. Singh Pramod Ecology and Urban India, Vol. II Ashish, New Delhi, 1987
12. Urban Sociology Rajendra K. Sharma, Atlantic Publishers & Distributers, New Delhi, 1997
13. A.K. Shrivastava, Urbanization: Concept & Growth: H.K. Publishers and Distributors, New Delhi, 1989
14. Khandagale, C.R Urban and Rural Sociology, Distance Education, Shivaji
15. University, Kolhapur.

BA. Part - III CBCS
Semester - V Paper- XI
Political Sociology (DSE-1021E5)

Course Outcomes: on completion of the course, student will be able to :

- CO 1: Understand the relationship between state and society in shaping politics in India both historically and analytically
- CO 2 : Make awareness about obstacles between rural development in India.
- CO 3: Create social awareness about women empowerment
- CO 4 : Understand the basic concept of rural sociology.

Modules	Political Sociology	Teaching Hours	Credits
Module I	Nature of Political Sociology A) Definition and Subject Matter of Political Sociology B) Emergence of Political Sociology C) Importance of Political Sociology	15	1
Module II	Basic Concepts in Political Sociology A) Power: Meaning and Nature B) State: Meaning and Nature C) Civil Society: Meaning and Nature	15	1
Module III	Study of Perspectives to Political Sociology A) Perspectives on Power: Weberian, Marxist and Ambedkarian B) Perspectives on State: Liberal, Pluralist, Power-elite, Post-modernist	15	1
Module IV	Political parties in India A) Political parties: characteristics and social composition. B) Pressure groups and Interest groups: characteristics and political significance. C) Major Political Parties and Their Principles	15	1

Reference Books :-

1. Bendix, R. and S. M. Lipset (Eds.). Class, Status and Power. London: RKP, 1966.
2. Bhargava, R. Secularism and its Critics. New Delhi: OUP, 1999.
3. Bottomore, T. Elites and Society. Harmondsworth: Penguin, 1966.
4. Chakravarty, A. Contradiction and Change. Delhi: OUP, 1975.
5. Dahl, R. Who Governs? New Haven: Yale University P, 1961.
6. Desai, A.R. State and Society in India: Essays in Dissent. Bombay: Popular Publication, 2000
7. Gerth, H.H. and C.W. Mills (Eds.). From Max Weber: Essays in Sociology. London: RKP, 1948.
8. Key, V.O. Politics, Parties and Pressure Groups. NY: Crowell, 1964.
9. Kohli, A. India's Democracy: An Analysis of Changing State-Society Relations. Princeton: Princeton University P, 1990.
10. Kohli, A. The State and Poverty in India: The Politics of Reform. Cambridge: Cambridge University P, 1999.

11. Kothari, R. Caste in Indian Politics. Delhi: Orient Blackswan, 2008.
12. Laclau, E. Politics and Ideology in Marxist Theory. London: Verso, 2012.
13. Miller, D. On Nationality. Oxford: Clarendon Press, 1995.
14. Mills, C.W. The Power Elite. NY: OUP, 2000.
15. Nash, K. Contemporary Political Sociology. Massachusetts: Blackwell Publishers, 2000.
16. Robinson, M. S. Local Politics: the Law of the Fishes. Delhi: OUP, 1988.
17. Runciman, W.G. Social Science and Political Theory. Cambridge: CUP, 1969.
18. Taylor, G. The New Political Sociology: Power, Ideology and Identity in an Age of Complexity. London: Palgrave Macmillan, 2010.
19. Vora, R. and S. Palshikar (Ed.) Indian Democracy, Delhi: Sage, 2004.
20. Weber, M. Economy and Society. Berkeley: University of California P, 1978.

BA. Part - III CBCS
SEC - Research Techniques – I

Course Outcomes : on completion of the course, student will be able to :

CO 1: Develop scientific approach about research techniques

CO 2: Understand the sampling technique.

CO 3: Understand the observation technique.

CO 4: Know the importance of scientific research.

Modules	Research Techniques - I	Credits
Module I	SAMPLING A) Meaning of sampling B) Types of sampling C) Advantages and Limitations of sampling	1
Module II	OBSERVATION A) Meaning & Characteristics. B) Types- I) Controlled and Un-Controlled (Means of self - Controlled) II) Participant and Non Participant C) Advantages and Limitations	1

REFERENCE BOOKS :-

1. Goode and Hatt Methods in Social Research, McGraw Hill Book Company, New York 1952.
2. PV. Young and Calvin F. Schmid, Scientific social survey and research prentice hall of India Private Ltd. New Delhi, 1982
3. Hans Raj, Theory and Practice in Social, Research, Surjeet Publication 7, K. Kamalanagar Delhi, 1979
4. Wikinson and Bhandarkar Methodology and Technique of Social Research, Himalaya Publication House Bombay - 1984
5. Bajpai S. R. Methods of Social Survey and Research, George Allenand Unwin, 1967
6. Galtung John Theory and Methods of Social Research, George Allen and Unwin, 1967
7. R. N. Sharma Research Methods in Social Sciences, Media Promoters and Publishers Pvt. Ltd. 1983
8. R. K. Sharma Sciences, Media Promoters and Publishers Pvt. Ltd. Bombay, 1983
9. Bateille A & Madan T.N., Encounter and Experience, Personal Accounts of Fieldwork, Vikas Publishing House, New Delhi, 1975
10. Bryman, Alan Quality and Quantity in Social Research, Unwin Hayman, London 1988
11. Jayaram N. Sociology : Methods and Theory, Mcmillan Madras 1989

17. Kothari C. R. Research Methodology; Methods and Techniques, Willey Eastern, Bangalore 1989
18. Punch, Keith Introduction to Social Research, Sage London 1988
19. Shipman, Martin: The limitations of Social Research Sage London 1988
20. Shrinivas M. N. & Shah A. M., Field-worker and the field, Oxford, Delhi, 1979

BA. Part - III CBCS
Semester - VI Paper- XII
INDIAN SOCIOLOGICAL THINKERS (DSE-1021F1)

Teaching Hours 60

Credits - 4

Course Outcomes :- On completion of the course, student will be able to :

- CO : 1 Introduced the importance of Indian sociological thinkers.
- CO : 2 Make awareness about contribution of thinkers towards social development.
- CO : 3 Inculcate new social and ethical values.
- CO : 4 Understand the theories of Indian sociological thinkers.

Modules	INDIAN SOCIOLOGICAL THINKERS	Teaching Hours	Credits
Module I	G.S.GHURYE A) Ideas On National Unity And Interaction B) Study On Caste C) Study On Indian Tribes	15	1
Module II	M.N.SRINIVAS A) Concept of Sanskritization B) Concept of Westernization C) Concept of Dominant Caste	15	1
Module III	A.R.DESAI A) Study Of Village Structure In India B) Study Of Indian Nationalism C) Analysis Of Indian Society Through Marxian Perspective	15	1
Module IV	IRAWATI KARVE A) Concept Of Kinship Relations B) Hindu Culture : An Interpretation C) Views On Maharashtra	15	1

REFERENCE BOOKS :-

1. Nagala B.K., Indian Sociological Thought Rawat Publications, Jaipur 2008
2. V.S.Upadhyay and Gaya Pandey, History of Anthropological Thought
3. Narendra K. Singh, Theory and Ideology in Indian Sociology Rawat
4. publication, Jaipur
5. T.K. Oommen and P.N. Mukharjee, Indian Society: Reflections and Introspections
6. A.R. Desai, Social Background Of Indian Nationalism.
7. A.R. Desai, Rural India In Transition
8. T. N. Madan, Western Sociologists On Indian Society

9. Yogendra Singh, Indian Sociology : Social Conditioning and Emerging Concerns
10. S.K. Pramanik, Sociology of G.S. Ghurye
11. Devdas Pilla,i Indian Sociology Through Ghurye : A Dictionary
12. A.R. Momin, The Legacy Of G.S. Ghurye
13. M.N. Srinivas, Social Change In Modern India

BA. Part - III CBCS
Semester - VI Paper- XIII
METHODS OF SOCIAL RESEARCH (DSE-1021F2)
Teaching Hours 60 Credits - 4

Course Outcomes: On completion of the course, student will be able to :

- CO : 1 Understand the data collection technique skills.
- CO : 2 Make awareness to increase research.
- CO : 3 Apply various research techniques to eradicate social problems.
- CO : 4 Explore the importance of social research.

Modules	METHODS OF SOCIAL RESEARCH	Teaching Hours	Credits
Module I	SAMPLING A) Meaning of sampling B) Types of sampling C) Advantages and Limitations of sampling	15	1
Module II	OBSERVATION- A) Meaning & Characteristics B) Types- I) Controlled and Un-Controlled II) Participant and Non Participant C) Advantages and Limitations.	15	1
Module III	INTERVIEW AND QUESTIONNAIRE A) Interview - Meaning & Characteristics. B) Advantages and Limitations of Interview C) Questionnaire - Meaning & Characteristics. D) Advantages and Limitations of Questionnaire	15	1
Module IV	Data Collection & Analysis A) Sources of Data Collection - 1) Primary - 2) Secondary- B) Use of Computer in Analysis of Data C) Writing of Research Report	15	1

REFERENCE BOOKS :-

1. Goode and Hatt Methods in Social Research, McGraw Hill Book Company, New York 1952.
2. P.V. Young and Calvin F. Schmid, Scientific social survey and research prentice hall of India
3. Private Ltd. New Delhi, 1982
4. Hans Raj, Theory and Practice in Social, Research, Surjeet Publication 7, K. Kamalanagar Delhi, 1979
5. Wikinson and Bhandarkar, Methodology and Technique of Social Research, Himalaya Publication House Bombay - 1984

6. Bajpai S. R. Methods of Social Survey and Research, George Allen and Unwin, 1967
7. Galtung John Theory and Methods of Social Research, George Allen and Unwin, 1967
8. R. N. Sharma Research Methods in Social Sciences, Media Promoters and Publishers Pvt. Ltd. 1983
9. R. K. Sharma Sciences, Media Promoters and Publishers Pvt. Ltd. Bombay, 1983
10. Bateille A & Madan T.N., Encounter and Experience, Personal Accounts of Fieldwork,
11. Vikas Publishing House, New Delhi, 1975
12. Bryman, Alan Quality and Quantity in Social Research, Unwin Hayman, London 1988
13. Jayaram N. Sociology : Methods and Theory, Mcmillan Madras 1989
14. Kothari C. R. Research Methodology; Methods and Techniques, willey Eastem, Bangalore 1989
15. Punch, Keith Introduction to Social Research, Sage London 1988
16. Shipman, Martin: The limitations of Social Research Sage London 1988
17. Shrinivas M. N. & Shah A. M. Field-worker and the field, Oxford, Delhi, 1979

BA. Part - III CBCS
Semester - VI Paper- XIV
Indian Rural Society (DSE-1021F3)

Teaching Hours 60 Credits - 4

Course Outcomes: on completion of the course, student will be able to :

- CO : 1 Understand the difference between rural urban community in India.
- CO : 2 Make awareness about obstacles between rural developments in India.
- CO : 3 Create social awareness about women empowerment.
- CO : 4 Understand the panchayat rajya system.

Modules	Indian Rural Society	Teaching Hours	Credits
Module I	Rural Society A) meaning and characteristics of rural society. B) the Importance of the study of rural society. C) Classifications of Villages i) Nucleated, Dispersed and Linear Villages ii) Migratory, Semi permanent & Permanent Villages	15	1
Module II	Indian rural economy A) Definition and characteristics of economy. B) Liberalization on the rural economy C) Characteristics of Indian rural economy.	15	1
Module III	Rural development A) Rural Development Concept. B) Rural Development Objectives. C) Obstacles to rural development.	15	1
Module IV	Panchayat Raj system A) Historical background. B) Zilla Parishad structure and functions C) Panchayat Samiti structure and functions. D) Gram Panchayat structure and functions.	15	1

REFERENCE BOOKS :-

1. Doshi S. L. & Jain P. C. Rural Sociology, Rawat Publication Jaipur, 2002.

2. Desai A. R. Rural Sociology in India, Popular Prakashan, Bombay (5th Edn) 1994.
3. Mukharji Radhakamal The Dynamics of Rural Society, A. C. Mukharji, Berlin 1957.
4. Desai A. R. Rural India in Transition, Popular, Bombay 1979.
5. Srinivas M. N. The Remembered village, Oxford University Press, Bombai 1978.
6. Beteille Andre Studies in Agrarian Social Structure, Oxford University Press, Delhi 1974.
7. Oommen T. K. Social Transformation in Rural India, Vikas Publication House, New Delhi 1984.
8. Joshi P. C. Land Reforms in India : Trends and Perspectives, Allied Publishers, Bombay 1978.
9. Joshi S. L. & Jain P.C. Rural Sociology, Rawat Publication Jaipur, 2002.
10. Sharma K. L. Rural Sociology in India, Rawat Publication Jaipur, 1997.
11. Desai A. R. Rural Sociology in India, Popular Prakashan, Bombay (5th Edn) 1994.
12. Mukharji Radhakamal The Dynamics of Rural Society, A. C. Mukharji Berlin 1957.
13. Desai Vasant Rural Development, Himalaya Publishing House, 1988.
14. Punit A. E. Social System in Rural India Sterling Publishers Pvt. Ltd. New Delhi 1978.
15. **Beteille Andre**, Caste, Class and Power, Oxford University press, (India),New Delhi, (2012).
16. **Beteille Andre**: 'The Study of Agrarian Systems: An Anthropological Approach', from Marxism
17. and Class Analysis, New Delhi: Oxford. 2007.
18. **Bandopadhyay** : 'Reflections on Land Reform in India since Independence' from T. V.
19. Satyamurthy (Ed.) Industry and Agriculture in India Since Independence, Delhi: Oxford University Press.
20. **Desai A.R.:**Rural Sociology in India Popular Prakashan, Bombai,(1969 reprint 2009) .
21. **NOTE: Visit to village and Grampanchayat and Understand its Structure and Rural Development Programs**
22. **Dhanagare, D. N.:** 'Green Revolution and Social Inequalities in Rural India' from, Economic
23. and Political Weekly, Vol. 22, No. 19/21, Annual Number (May, 1987),
24. **Doshi SL and Jain PC:** Rural Sociology, Rawat Publication, Jaipur, (1999)
25. **Dube SC:** Indian Village, Routledge,New York, (Second edition 2018)
26. **Mukherjee Ramkrishna:** The Dynamics of a Rural Society, Akademie -Verlag, Berlin, (1957)
27. **Oommen T.K.:** Green Revolution and AgrarianConflicts, Economics and Political weekly, Vol.-6,Issue-26(1971)
28. **Shah, A.M.:** Changes in the Indian Family: An Examination of Some Assumptions', in The
29. Family in India: Critical Essays, New Delhi: Orient Longman (1998)
30. **Srinivas M.N.:** India: Social Structure, Hindustan Publishing Corporation, Delhi (1980)

BA. Part - III CBCS
Semester - VI Paper- XV
INDUSTRIAL SOCIOLOGY (DSE-1021F4)
Teaching Hours 60 Credits - 4

Course Outcomes: on completion of the course, student will be able to :

- CO : 1 Understand the earlier production system.
- CO : 2 Know the concept of Bureaucracy.
- CO : 3 Aware about recent changing nature and challenges in Industrial Sector.
- CO : 4 Understand the importance of automation in industrial sector.

Modules.	INDUSTRIAL SOCIOLOGY	Teaching Hours	Credits
Module I	NATURE OF INDUSTRIAL SOCIOLOGY A) Definition and Subject Matter of Industrial Sociology B) Importance of the study of Industrial Sociology C) Impact of Industrialization on Society: Family and Class Mobilization	15	1
Module II	EVOLUTION OF PRODUCTION SYSTEM A) Earlier System of Production: Manorial System, Guild System, Domestic System. B) Rise of the Factory System: Causes and Characteristics	15	1
Module III	INDUSTRIAL ORGANIZATION A) Concept and Types of Industrial Organization . B) Henry Fayola's Theory of Organization. C) Characteristics of Industrial Bureaucracy.	15	1
Module IV	RECENT CURRENTS IN THE INDUSTRIAL SECTER A)Automation :-Meaning and Characteristics B)Computerization:- Meaning and Characteristics	15	1

REFERENCE BOOKS :-

1. Schneider E.V Industrial Sociology, McGraw Hill, New York, 1957
2. Gisbert Pascal Fundamentals of Industrial Sociology, McGraw Hill Bombay 1972
3. Laxmanna C. Workers, Participation and Industrial democracy, Ajantha Publications, New Delhi.
4. Giri V.V. Labour Problems in Indian Industry, Asia Publishing House, Bombay, 1962
5. Henry Fayol Principles of General and Industrial Management
6. Waston T.J. Sociology, work and industry, Routledge & Keganpaul, London, Boston, and Henley.
7. Kiely, Ray & Phil, Globalization and Third World, Routledge, London.
8. Morfleet (eds) Peter F. Drucker, The effectice Executive, Pan Book in association with William Heinemhn.

BA. Part - III CBCS
Semester - VI Paper- XVI
SOCIAL ANTHROPOLOGY (DSE-1021F5)
Teaching Hours 60 Credits - 4

Course Outcomes: on completion of the course, student will be able to :

- CO : 1 Understand the social aspects of tribal's in India.
- CO : 2 Create social awareness to eradicate the problems of tribal community.
- CO : 3 Explore various schemes to tribal community.
- CO : 4 Understand the culture of Paradhi community.

Modules	SOCIAL ANTHROPOLOGY	Teaching Hours	Credits
Module I	INTRODUCTION TO SOCIAL ANTHROPOLOGY A) Social Anthropology: Meaning and Characteristics. B) Relation Between Social Anthropology And Sociology. C) Field work Method and its Characteristics. D) Importance of Social Anthropology.	15	1
Module II	TRIBAL SOCIETY IN INDIA A) Tribal Society : meaning and Characteristics. B) Social life : Family ,and Marriage Characteristics. C) Economic Life : Characteristics. D) Religious Life : Beliefs and practices.	15	1
Module III	TRIBAL PROBLEMS A) Poverty and Indebtedness B) Land Alienation C) Illiteracy and Exploitation D) Religious Crisis	15	1
Module IV	Tribal Community in Maharashtra: Pardhi A) Socio-Cultural life : Tradition and Change B) Economic life : Tradition and Change C) Religious life : Tradition and Change D) Social Movements for Development of Pardhi Community	15	1

REFERENCE BOOKS :-

1. Mujumdar D.N. & Madan T.N., An Introduction to Social Anthropology, Asia Publishing House, Bombay, 1973.
2. Singh K. S. Tribal Situation in India, Indian Institute of Advanced Study, Simla, 1972.

3. S.L. Doshi & P. C. Jain Social Anthropology Rawat Publicaiton, 2001.
4. R.N. Patil & Bansantibala Jena, Tribal Development in India, Ashish Publishing, House, New Delhi.
5. Vidyarthi L.P. Tribal Culture of India, Concept Publishers, New Delhi, 1976.
6. E.E. Evans Pritchard Social Anthropology and Other Essays, The free Press, New York, 1962.
7. Mujumdar D.N. and Madam T.N An Introduction to Social Anthropology, Asia Publishing House, Bombay, 1973.
8. K. S. Tribal Situation in India, Indian Institute of Advanced Study, Simla, 1972.
9. S.L. Doshi & P. C. Jain, Social Anthropology Rawat Publicaiton, 2001.
10. Mane Lximan, Vimuktayan, Yashvantrav chavan prtishthan, Satara 1994 (Marathi)
11. Prabhune Girish, Pardhi, Rajhans Prakashan, pune. 2006 (Marathi)
12. Pawar Deepak, Pardhi Samajache Antrang, Shree Sainath Prakashan, Nagapur. 2014 (Marathi)
13. Chavan Ramnath, Bhatakya vimukantanchi Jatpanchayat, Deshmukh ani company Pune. 2006 (Marathi)

Journals:

- i) gkdjk (Hakara)
- ii) Social Change (New Delhi)
- iii) Man in India (Ranchi)
- iv) Tribal research bulletin (Marathi and English)
Tribal Research Institute Pune.
- v) Human Ecology : Journal of manenvironmental relationship Kamlaraj, Enterprises Delhi.
- vi) Ritzer George Sociological Theory, Tata Mcgraw Hill, 1996
Morrison, Ken Marx,

**BA. Part - III CBCS
SEC - Research Techniques - II**

Course Outcomes : on completion of the course, student will be able to :

- CO 1: Develop scientific approach about research techniques
- CO 2: Understand the Interview techniques.
- CO 3: Understand the Questionnaire techniques.
- CO 4: Know the importance of scientific research.

Modules	RESEARCH TECHNIQUES -II	Credits
Module I	INTERVIEW A) Interview - Meaning & Characteristics. B) types of Interview C) Main Steps of Interview D) Advantages and Limitations of Interview	1
Module II	QUESTIONNAIRE A) Questionnaire - Meaning & Characteristics. B) Types of Questionnaire Questionnaire C) Technique of Constructing D) Advantages and Limitations of Questionnaire	1

REFERENCES:

1. Goode and Hatt Methods in Social Research, McGraw Hill Book Company, New York 1952.
2. PV. Young and Calvin F. Schmid, Scientific social survey and research prentice hall of India Private Ltd. New Delhi, 1982
3. Hans Raj, Theory and Practice in Social, Research, Surjeet Publication 7, K. Kamalanagar Delhi, 1979.
4. Wikinson and Bhandarkar, Methodology and Technique of Social Research, Himalaya
5. Publication House Bombay - 1984
6. Bajpai S. R. Methods of Social Survey and Research, George Allen and Unwin, 1967
7. Galtung John Theory and Methods of Social Research, George Allen and Unwin, 1967
8. R. N. Sharma Research Methods in Social Sciences, Media Promoters and Publishers Pvt. Ltd., 1983
9. R. K. Sharma Sciences, Media Promoters and Publishers Pvt. Ltd. Bombay,
10. 1983
11. Bateille A & Madan T.N., Encounter and Experience, Personal Accounts of Fieldwork,
12. Vikas Publishing House, New Delhi, 1975
13. Bryman, Alan Quality and Quantity in Social Research, Unwin Hayman, London 1988
14. Jayaram N. Sociology : Methods and Theory, Mcmillan Madras 1989
15. Kothari C. R. Research Methodology; Methods and Techniques, willey Eastem, Bangalore 1989
16. Punch, Keith Introduction to Social Research, Sage London 1988

17. Shipman, Martin: The limitations of Social Research Sage London 1988
18. Shrinivas M. N. & Shah A. M., Field-worker and the field, Oxford, Delhi, 1979

EVALUATION PATTERN
Scheme of Marking

Paper No.	Course code	Title of Paper	Sem-end Examination	Continuou s Internal Evaluation	Total Marks
SEM V					
VII	DSE-1021E1	Western sociological thinkers	40	10	50
VIII	DSE-1021E2	Methods of social research	40	10	50
IX	DSE-1021E3	Rural Sociology	40	10	50
X	DSE-1021E4	Urban Sociology	40	10	50
XI	DSE-1021E5	Political Sociology	40	10	50
SEC	AE	Research techniques I			
SEM VI					
XII	DSE-1021F1	Indian sociological thinkers	40	10	50
XIII	DSE-1021F2	Methods of social research	40	10	50
XIV	DSE-1021F3	Indian Rural Society	40	10	50
XV	DSE-1021F4	Industrial Sociology	40	10	50
XVI	DSE-1021F5	Social Anthropology	40	10	50
SEC	AF	Research techniques II			

Nature of Question Paper

Total Marks: 40

Time : 2 hrs

Question No.	Question pattern	Marks
Q. 1	A) Select the right answer from the options given below.	5 Marks
	B) Write the answer in one sentence/ Match the following.	5 Marks
Q. 2	A) Answer the following question in detail. (Any 1)	10 Marks
	B) Answer the following question in detail. (Any 1)	10 Marks
Q. 3	Write short notes. (Any 2)	10 Marks

BA. 3 SEM V & VI Continuous Internal Evaluation

Evaluation Pattern	Marks
Home Assignment/Seminar/students projects	10

SEC - AE & SEC - AF (Sem V and VI) Scheme of Teaching, Learning and Evaluation

1. These courses are of self study mode. The study material of the above courses will be made available on the departmental blog on the college website.
2. The examination will be of 50 marks having 25 MCQ questions.
3. Minimum 20 marks (40%) out of 50 are required for passing.
4. The duration of examination will be 60 minutes.
5. The examination will be conducted at the college level.
6. The degree will be awarded only after successful completion of these courses.

“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF HOME SCIENCE

B.A. Part - III

Semester-V & VI

SYLLABUS

Under Choice Based Credit System

To be implemented from Academic Year 2020-21

CHOICE BASED CREDIT SYSTEM
BA - III (Sem - V and VI) Home Science
Course Structure
to be implemented from 2020 - 21

Paper No.	Course Code	Title of the Course	Total Credits (Theory and Practicals)
Semester III			
VII	DSC - 1023E1	Nutrition for the Family	5 (3+2)
VIII	DSC - 1023E2	Fundamentals of Textile Science Apparel Construction-II	6 (4+2)
IX	DSC - 1023E3	Life Span Development	4(4+0)
X	DSC - 1023E4	Space Planning and Design	5(3+2)
XI	DSC - 1023E5	Research Methodology in Home Science	4 (4+0)
Elective Paper - I		Fashion and Apparel Designing	6 (4+2)
SEC	AE	Home Based Catering -I	2 (2+0)
Semester VI			
XII	DSC - 1023F1	Therapeutic Nutrition	5(3+2)
XIII	DSC - 1023F2	Traditional Indian Textiles and Embroidery	6 (4+2)
XIV	DSC - 1023F3	Introduction to Guidance and Counselling	4 (4+0)
XV	DSC - 1023F4	Entrepreneurship Development	5 (3+2)
XVI	DSC - 1023F5	Extension for Development	4 (4+0)

E-II		Bakery Science	5(3+2)
SEC	AF	Home Based Catering- II	2(2+0)

B.A. Part-III CBCS
Semester - V Paper - VII
Nutrition for the Family (1023E1)
Theory - Credits - 3, Practical - Credit -2

COURSE OUTCOMES: On completion of the course Students will be able to:

- CO1 Acquaint with the concept of RDA, nutritional guidelines, nutritional importance and healthy food choices.
- CO2 Understand the concept and application of food exchange list and nutrition in daily meal planning.
- CO3 Apply knowledge of meal planning in day to day life.
- CO4 Calculate nutritive value.

Modules	Content	Teaching hours
Module 1	Principles of Meal Planning 1.1 Concept and importance of Balanced Diet	14

	1.2 Concept and use of Food Exchange List 1.3 Concept and importance of DRI (Dietary Reference Intakes) and RDA 1.4 Factors affecting Meal Planning 1.5 Dietary Guidelines for Indians and Food Pyramid	
Module 2	Nutrition in Adulthood 2.1 RDA, nutritional guidelines, nutritional importance and healthy food choices for Adult 2.2 Physiological changes, RDA, nutritional guidelines, nutritional and Importance and healthy food choice for Elderly	08
Module 3	Nutrition during pregnancy and lactation 3.1 Physiological changes, RDA, nutritional guidelines, nutritional Importance and healthy food choice for Pregnant Woman 3.2 Physiological changes, RDA, nutritional guidelines, nutritional and Importance and healthy food choice for Lactating Mother	08
Module 4	Nutrition during Infancy to Adolescent 4.1 Growth and development, RDA, nutritional guidelines, nutritional importance and healthy choices for Infants 4.2 Growth and development, RDA, nutritional guidelines, nutritional importance and healthy choices for Preschool Children 4.3 Growth and development, RDA, nutritional guidelines, nutritional importance and healthy choices for School children 4.4 Physiological changes, RDA, nutritional guidelines, nutritional importance and healthy food choice for Adolescents	08

PRACTICALS

Credit-2

Objectives:

1. To develop in students, the concept of portion size.
2. To impart skills of healthy cooking practices and its application in meal management.

Practical 1. Factors to be consider while meal planning

Practical 2. Use of food exchange list

Practical 3. Nutritive value calculations

Practical 4. Planning and preparation of diets with Nutritive value calculations for

- Adolescent/Young adult
- Pregnant / Lactating woman

- Infant (6 months to 2 years)
- Preschool child/ School age child
- Elderly person

References:

1. Edelstein S, Sharlin J (ed). Life Cycle Nutrition- An Evidence Based Approach; 2009; Jones and Barlett Publishers.
2. Khanna K et al. Textbook of nutrition and dietetics; 2013; Phoenix Publisher.
3. Sharma S, Wadhwa A. Nutrition in the community- A textbook; 2003; Elite Publishing House Pvt. Ltd.
4. Jain P et al. *Poshan va swasthya ke mool siddhant (Hindi)*; First Ed; 2007; Academic Pratibha.
5. Malhan, Gupta, Jain. *Aahar aayojan, khadya sangrakshan evam griha vyavastha (Hindi)*; 1993; Sultan Chand & Sons Publishing.
6. Vrinda S. *Aahar Vigyan (Hindi)*; 2003; Shyam Prakashan.
7. Ghosh S. Nutrition and child care- A practical guide; 1997; Jaypee Bros.
8. Savage King F, Burgess A. Nutrition for developing countries; Second Ed; 1993; Oxford University Press.
9. Dietary guidelines for Indians- A Manual; 2011; NIN, ICMR, Hyderabad.
10. Gopalan, C et al. Nutritive Value of Indian foods; 1994; NIN, ICMR, Hyderabad.
11. Raina U, Kashyap S et al. Basic Food Preparation-Complete Manual; 2005; Orient Longman
12. Seth V and Singh K (2006). Diet Planning through the Life Cycle: Part 1 Normal Nutrition. A Practical Manual. Elite Publishing House Pvt. Ltd. New Delhi.
13. Chadha R and Mathur P eds. (2015) Nutrition: A Lifecycle Approach: Orient Blackswan, New Delhi.
14. Shreelaxmi B.(2007). Dietetics: New Age International(P) Limited, Publishers, New Delhi 15.
15. Joshi Shubhangini H.(2012). Nutrition and Dietetics with Indian Case Studies, Tata McGraw Hill Education Private limited, New Delhi
16. Dr. Molavane Manjusha S.(2001). Poshhan Shastra(Marathi): Kailash Publications, Aurangabad.
17. Dr. Molavane Manjusha S.(2016). Annache Vidnyan-Poshan Shastra(Marathi): Aatmbhan Prkashan, Hingoli. .
18. Farkade Triveni s. and Gonge Sulabha S.(2010). Poshan Aani Aaharshastra(Marathi), Pimpalpure and co. Publishers, Nagpur.

B.A. Part-III CBCS
Semester – V Paper – VIII
Fundamentals of Textile Science and Apparel Construction -II(1023E2)
Theory – Credits – 4, Practical –Credit -2

Course Outcomes:

On completion of the course Students will be able to

- CO1. Understand the concept of textile printing and painting.
- CO2. Apply the knowledge of elements and principles of design in apparel construction.
- CO3. Describe basic concepts of croqui.
- CO4. Demonstrate the elements of apparel construction.

Modules	Content	Teaching hours
Module 1	Introduction to Textile Printing and Painting 1.1 Concept of Textile printing and painting 1.2 Styles of printing - Direct, Resist, Discharge 1.3 Methods of Painting - Block, Stencil, Screen 1.4 Fabric painting - Plain, Dotted, Lining, Triangle, Shading	15
Module 2	Principles and Elements of Design in Apparel Construction 2.1 Principles of Design - Proportion, Balance, Rhythm, Centre of Interest, Harmony 2.2 Elements of Design- Colour, Line, Texture, Space, Silhouette	15
Module 3	Basics of Croqui 3.2 Ten Head Croqui - Front and Back view 3.3 Hand and Leg movements 3.4 Types of figure	15
Module 4	Elements of Apparel Construction 4.1 Necklines 4.2 Yokes 4.3 Sleeves 4.4 Collars 4.5 Fastener's	15

Practical: Credit-2

Practical Lecture : 60

1. Preparation of samples of the following:

- i) Block printing, Stencil printing - One sample each
- ii) Tie and dye (Bandhani) - Single colour and Double Colour

2. Construction of following apparels using elements of Apparel Construction

- i) Kamiz / Designer Kurti/ Short top
- ii) Salwar/Chudidar/ Patiala

References:

1. Sodhia Manmeet, Dress Designing, Kalyani Publishers new Delhi.
2. Sodhia Manmeet, Designing Studies, Kalyani Publishers new Delhi
3. Sahu R. K. Handbook of Fashion and Textile Designing, Satyam Publishers and Distributors Jaipur
4. Khurana Kamal, Draping and Pattern Making for Fashion Designing , 2012 Sonali Publication New Delhi
5. Encyclopedia of Dress Making , 2010 A.P.H. Publishing House New Delhi
6. Gupta Sushma, Garg Neeru, Saini Renu , Text Book of Clothing and Textiles 2004 Kalyani Publishers New Delhi.
7. किटे कांचन, माळोदे भावना फॅशन डिजाईनिंगची मुलतत्वे २०१४ श्री साईनाथ प्रकाशन , नागपूर
8. वैरागडे उज्ज्वला, अग्रवाल अन्विता , वस्त्रशास्त्राची संकल्पनाव फॅशन डिजाईनिंग 2009 विद्या बुक्स पब्लिशर्स औरंगाबाद .
9. काळे सुनिता, वस्त्रशास्त्र , पवन प्रकाशन , परभणी
10. झारापकर का.रा. शिवण शास्त्र भाग 1 व २ नवनीत पब्लिकेशन्स मुंबई
11. भिसे पद्मावती , सोपे शिवणकाम , मॅजेस्टीक बुकस्टॉल मुंबई
12. हेगडे कृ.म. शास्त्रोक्त शिवणकला भाग १ व २ हेगडे टेलरिंग कॉलेज पुणे.

\

Semester - V Paper - IX
Life Span Development (DSC-1023 E3)
Theory - Credits - 4

Course Outcomes: After completion of the course Students will be able to:

CO 1 Understand the changes in the physical, motor, cognitive, and moral development during late childhood and adolescence.

CO2 Know about the effects and problems faced during adolescence.

CO3 Understand the changes in socialization during late childhood and adolescence and its impact on the relationship.

CO4 Understand the development of morality.

Modules	Content	Teaching hours
Module 1	<p>Late Childhood (6 to 12 years): Physical, Motor Development, Emotional development.</p> <p>1.1 Characteristics of late childhood</p> <p>1.2 Physical Development- height, weight, body proportion, muscle and fat, skeleton, brain.</p> <p>1.3 Motor Development- Abilities for Motor Skills- flexibility, balance, agility, force, speed</p> <p>1.4 Emotional Development- developing sense of self, self-esteem, self-control heightened emotionality, emotional catharsis</p>	15
Module 2	<p>Late Childhood- Cognitive development, Social and Moral development</p> <p>2.1 Cognitive Development- Logical thinking (concrete operations), development of concepts- conservation, seriation, classification, reversibility, numerate.</p> <p>2.2 Social Development- Characteristics of child gangs, impact of gang behavior, peers during late childhood, group leadership.</p> <p>2.3 Moral Development- Parents and moral development, Kohlberg's theory (pre-conventional, conventional, post-conventional), discipline and its elements, role of family relationship.</p>	15
Module 3	<p>Adolescence (12-20 years): Physical Growth, Effects and problems</p> <p>3.1 Meaning, definition and characteristics of Adolescence</p> <p>3.2 Physical Growth- Height, weight, body proportion, changes in (primary and secondary) sex characteristics, growth spurt.</p>	15

	<p>3.3 Effect of Puberty- Health (importance of balanced diet, exercise, obesity, anemia),attitude and behavior, early and late maturity</p> <p>3.4 Adolescent problems- Addictions (drugs, alcohol, mobile, gaming, social media), pre-marital sex, teenage pregnancy, juvenile delinquency, Sexually Transmitted Diseases (STD's), depression and suicide, impulsive behaviors (risks and accidents).</p>	
Module 4	<p>Adolescence : Socialization</p> <p>4.1 Friendships - Importance, characteristics, types of friendships (cliques, crowds, gang)</p> <p>4.2 Relationship with family: Importance, causes of conflict with parents and siblings, Improvement</p> <p>4.3 Relationship with peers: Importance, influence of peers</p> <p>4.4 Gender equality: Concept and importance in socialization</p>	15

Sectional Work:

1. Preparation of scrap book on Late Childhood
2. Preparation of scrap book on Adolescence.
3. Case Study-Late Childhood / Adolescence

References:

1. Dr. Khalane Shashikant, वैकासिक मानसशास्त्र (Vaikasic Manasshashtra) (Marathi), Atharv Publication, Dhule
2. Dr. Jadhv K. M., वैकासिक मानसशास्त्र (Vaikasic Manasshashtra) (Marathi), Diamand Publication, Pune
3. Hirave R. S. , Tadasare V. D. . वैकासिक मानसशास्त्र (Vaikasic Manasshashtra) (Marathi), Phadake Prakashan, Kolhapur
4. Santrock John. W : Life Span Development, McGrawhill higher education, Boston 2004
5. Laura E. Berk : Child Development Prentice Hall of India Private Ltd. New Delhi (India), 2007
6. Diane E. Papalia, Sally Wendkos, Ruth Duskin Felsman : Human Development, The McGraw Hill Company Limited, New Delhi, 2004.
7. Hurlock E. B. : Child Development, 6th Edition, International Student Edition. McGraw Hill Book Company, 1987.

8. Hurlock E. B. : *Development Psychology, A life Span Approach*. Tata Mc Graw - Hill Publishing Company Ltd. New Delhi., 1980
9. Steinberg L. and Belsky J. : *Infancy, Childhood & Adolescence Development Context*. McGraw - Hill, Inc. USA, 1991

**B.A. Part-III CBCS
Semester - V Paper - X**

Space Planning and Design (DSC - 1023E4)
Theory - Credits - 3 Practical - Credit -2

Course Outcomes: On completion of the course Students will be able to:

- CO1 Prepare floor plan according to various income group.
- CO2 Utilize the skills of Kitchen gardening and landscaping.
- CO3 Appreciate the need space planning and design.
- CO4 Optimize space using knowledge of interior environment.

Modules	Content	Teaching hours
Module 1	Basic Concept in Space Planning and Design 1.1 Concept of house and adequacy of space 1.2 Characteristics and Principles of Space Planning 1.3 Importance of Housing 1.4 Factors affecting of housing needs of the family	07
Module 2	Space Planning 2.1 Factors in House planning- site selection (Soil, Health and Community facilities) 2.2 Types of houses 2.3 Symbols used in house plan 2.4 Types of House Plans.	08
Module 3	Housing and Interior Environment 3.1 Features of housing: Storage spaces, Kitchen, Terrace, Parking area, and Boundary walls. 3.2 Plumbing 3.3 Drainage facility.	15
Module 4	Room by Room space planning 4.1 Concept and Importance of room by room space planning. 4.2 Kitchen. 4.3 Drawing Room. 4.4 Bed Room 4.5 Other Area ; Balcony and passage	15

Practical:

1. Symbols used in House plan.

Practical Lectures:60

2. Draw ground floor plan for Low income group.
3. Draw ground floor plan for Middle income group.
4. Draw ground floor plan for High income group.
5. Space planning of kitchen and drawing room/ Bed room
6. Visit to Furniture mall Or Residential space.

Reference books:

1. Mark Kerlen, Space planning Basics, 3rd Edition. John Willey and Amp.sons.
2. Joseph De Chiara, Interior Design and Space, 2nd edition. Time Saver Standards
3. Aadhunik Gruha Yojana va Antargat Sajavat (Marathi): Dr.Vairagade, Latakar, Mule; Vidya Publishers Aurangabad.
4. Margaret G. and Greves Beryl, Fabric Furnishing Bulter, S. B.T. Batsford Ltd., London.
5. Deongarikerry K.S., Interior Decoration in India.
6. Encyclopedia of Interior Design and Decoration.
4. Fauliner and Faulkner, Inside Todays Home, Helt Rinehort and Winstd, New York.
5. Anna Rutt and Heng, Home Purnishing, Willey Eastern Pvt. Ltd., Delhi
9. Purohit S.S., Home Gardening.

Periodicals:

1. Inside and Outside
2. Journal of Interior Design
3. Interior Architecture and Interior Design
4. Journal of Architecture, London
5. Human Factors: The Journal of Human factors and Ergonomics Society
6. International Journal of Occupational safety and Ergonomics

Semester - V Paper - XI
Research Methodology in Home Science (DSC-1023E5)
Theory - Credits - 4

Course Outcomes: On completion of the course Students will be able to:

- CO1. Understand the concept and importance of research.
- CO2. Know tools and methods of research.
- CO3. Apply research tools in Home Science.
- CO4 Inculcate the research culture.

Modules	Content	Teaching hours
Module 1	Introduction to Research 1.1 Concept of Research 1.2 Need and Importance of Research 1.3 Types of Research 1.4 Steps of research	15
Module 2	Research Methodology 2.1 Concept and Types of data 2.2 Methods of Data collection 2.3 Sampling techniques 2.4 Interpretation of data - Measures of Central Tendency	15
Module 3	Researches in Home Science 3.1 Scope of Home Science Education in Research 3.2 Facilities required for conducting research 3.3 Use of reference material 3.4 Report Writing - Concept and steps	15
Module 4	Thrust areas of Research in Home Science 4.1 Food & Nutrition 4.2 Family Resource Management 4.3 Human Development & Family Studies 4.4 Textile Science and Apparel Construction 4.5 Communication and Extension	15

Sessional works -

Research Project on any topic related to Home Science

Total 10 marks

References:

1. Research Methodology - Kothari
2. Handbook of Statistics - Sukhatme
3. Statistical analysis for agricultural research - Gomez and Gomez
4. The quality of life : Valuation in social research - Mukharjee, R.

Periodicals :

1. Souvenir - HSAI
2. Souvenir - NSI

B.A. Part-III CBCS
Semester - V Paper - XII
FASHION AND APPAREL DESIGNING (Elective)
Theory - Credits - 4, Practical - Credit -2

Course Outcomes: On completion of the course Students will be able to:

CO1 Student will be able to gain knowledge of elements of Design

CO2 Student will be able to gain knowledge Principles of Design

CO3 Student will be able to Sketch of Garments

CO4 Student will be able to demonstrate the elements of apparel Constructions

Modules	Content	Teaching hours
Module 1	Fashion Designing 1.1 History of Fashion Designing, concept of Fashion. 1.2 Fashion Terminology 1.3 Factors influencing Fashion, Fashion Cycle 1.4 Sources of Fashion	15
Module 2	Adoption of Fashion 2.1 Consumer groups - Fashion leaders - followers 2.2 Adoption Process- Trickle -Down Theory , Bottom up Theory and Trickle across Theory	15
Module 3	Design 3.1 Elements and Principals of Design 3.2 Structural and applied design 3.3 Role of designer	15
Module 4	Components of Apparel Construction 4.1 Fabric ,Seems, Stitches ,Thread, Shaping Methods, dart, equivalentents 4.2 Sleeves Cuffs, necklines collars Plackets Yokes Pockets. 4.3 Style variation: bodice skirts Trousers in Various Silhouettes.	15

PRACTICAL

1. Flat Sketching of garments
2. Study of collections of famous designers
3. Construction of skirt of self

PRACTICAL LECTURES - 60

4. Construction of skirt Top / kurta for self

REFERENCE

- Brown Patty ,Rice J, 1998, Ready to Wear Apparel Analysis Prentice Hall
- Tast S.L. Edwards M.S. 1982.
- वैरागडे उज्वला,अग्रवाल अन्विता ,वस्त्रशास्त्राचीसंकल्पनाव फॅशन डिझाईनिंग
- 2009 विद्या बुक्सपब्लिशर्सऔरंगाबाद .
- काळे सुनिता,वस्त्रशास्त्र ,पवन प्रकाशन ,परभणी
- झारापकर का.रा.शिवण शास्त्र भाग 1 व २ नवनीत पब्लिकेशन्स मुंबई
- भिसे पद्मावती ,सोपे शिवणकाम ,मॅजेस्टीक बुकस्टॉल मुंबई
- हेगडे कृ.म.शास्त्रोक्त शिवणकला भाग १ व २ हेगडे टेलरिंग कॉलेज पुणे.

B.A. Part-III CBCS
Semester - V Paper - XII
SEC III: Home Based Catering - I (SEC - AE)
Theory - Credits - 2

Course outcomes: On completion of the course students will be able to:

- CO1. Understand the kinds of food service establishments
- CO2. Understand food production process
- CO3. Know the importance of hygiene and sanitization
- CO4. Know state wise Indian food and their history

Modules	Theory and Practical
Module 1	Introduction to Food Service <ul style="list-style-type: none"> - Kinds of food service establishments - Factors contributing to the growth of food service industry
Module 2	Food Production <ul style="list-style-type: none"> - Menu planning: Importance of menu, Factors affecting menu planning, Menu planning for different kinds of food service units Food Purchase and Storage <ul style="list-style-type: none"> - Standardization of recipes - Quality and Quantity of food preparation
Module 3	Hygiene and Sanitization What is Hygiene Importance of hygiene and sanitization
Module 4	Indian Cookery <ul style="list-style-type: none"> a) Maharashtra b) Gujarat c) Rajasthan d) Punjab

Reference Books:

1. West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised
2. By Hargar FV, Shuggart SG, &Palgne Palacio June, Macmillian Publishing Company New York.
3. Sethi Mohini (2005) Institution Food Management New Age International Publishers
4. Knight J B &Kotschevar LH (2000) Quantity Food Production Planning & Management 3rd edition John Wiley & Sons
5. Philip E Thangam (2008) Modern Cookery for teaching and Trade Part I & II Orient Longmam

6. Taneja S and Gupta SL (2001) Entrepreneurship development, Galgotia Publishing

B.A. Part-III CBCS
Semester - VI Paper - XII
THERAPEUTIC NUTRITION (DSC-1023 F1)
Theory - Credits - 3

COURSE OUTCOMES: On completion of the course Students will be able to:

CO1 Understand the etiology, clinical features of various diseases

CO2 Appraise various types of diseases

CO3 Modify normal diet according changing needs of various therapeutic conditions

CO4 Analyze nutritive value

Modules	Content	Teaching hours
Module 1	Introduction to Therapeutic Nutrition 1.1 Meaning and Objectives of Therapeutic Nutrition 1.2 Role of Dietician in Nutrition Care Process 1.3 Therapeutic adaptations of the normal diet a. Progressive diets–clear fluid, full fluid, soft and regular b. Method of Feeding-tube, parenteral c. Modification of diet according nutrient requirement	15
Module 2	Etiology, clinical features, types and nutritional management of Infections and Fever 2.1 Typhoid 2.2 Tuberculosis 2.3 HIV	15
Module 3	Etiology, clinical features, types and nutritional management of G I Tract Disorders: 3.1 Diarrhea 3.2 Constipation 3.3 Infective Hepatitis	07
Module 4	Etiology, clinical features and nutritional management in following condition 4.1 Overweight and Obesity 4.2 Underweight 4.3 Eating Disorders: Anorexia Nervosa and Bulimia	08

PRACTICALS:

Practical Lectures:60

Objectives:

1. To develop in students, the basic concept of Nutrition care and Therapeutic nutrition.
2. To impart skills in planning and preparation of therapeutic diet.

Practical 1. Planning and preparation of Progressive diets–clear fluid, full fluid, soft and regular

Practical 2. Planning, preparation and nutritive value calculations of diet for Typhoid/Tuberculosis

Practical 3. Planning, preparation and nutritive value calculations of diet for Diarrhoea/Constipation and Infective Hepatitis

Practical 4. Planning, preparation and nutritive value calculations of diets for Obesity/Underweight

References:

1. Khanna, K, Gupta S, Seth, R, Passi, S. J, Mahna, R, Puri, S (2013). Text book of Nutrition• and Dietetics. Phoenix Publishing House Pvt. Ltd.
2. Mahan, L. K and Escott Stump, S (2013). Krause’s Food & Nutrition Therapy, 13thed. Saunders-Elsevier. Stacy, Nix (2009).
3. William’s Basic Nutrition and Diet Therapy, 13th Edition. Elsevier, Mosby.
4. ICMR (1999). Nutritive Value of Indian Foods. National Institute of Nutrition, Indian Council of Medical Research, Hyderabad.
5. Joshi Shubhangini H.(2012). Nutrition and Dietetics with Indian Case Studies,Tata McGraw Hill Education Private limited, New Delhi
6. Waghmare-Naik, Shobha(2010): *Aaharopchar Aani Samudayik Poshan(Marathi)*,Vidya Books Publishers, Aurangabad.
7. Shreelaxmi B.(2007). Dietetics: New Age International(P) Limited,Publishers, New Delhi.
8. Farkade Triveni s. and Gonge Sulabha S.(2010). *Poshan Aani Aaharshastra(Marathi)*, Pimpalpure and co. Publishers, Nagpur.

Periodicals:

1. Asian Journal of Home Science
2. Indian Journal of Nutrition and Dietetics
3. Journal of Food Science and Technology
4. Indian Journal of Dairying, Food and Home Science
5. Indian Journal of Medical Research
6. American Journal of Clinical Nutrition
7. International Journal of Food Sciences and Nutrition
8. Journal of American Dietetics Association

B.A. Part-III CBCS
Semester - VI Paper - XIII
Traditional Indian Textiles and Embroideries (DSC- F2)
Theory - Credits - 4

Course Outcomes: On completion of the course Students will be able to:

CO1. Understand the concept of Traditional Indian textile.

CO2. Demonstrate skills in Traditional Indian Embroideries.

CO3. Acquaint skill of basic and traditional embroidery.

CO4. Develop entrepreneurship skills in traditional embroidery and stitches.

Modules	Content	Teaching hours
Module 1	Traditional Textiles of Maharashtra and Gujrat 1.1 History, technique, designs and colour: Paithani of Maharashtra 1.2 History, technique, designs and colour: Patola of Gujrat	15
Module 2	Traditional Textiles of Banaras and West Bengal 2.1 History, technique, designs and colour: Brocades of Banasar 2.2 History, technique, designs and colour: Balucheri and Jamdani of West Bengal	15
Module 3	Basic Indian Hand Embroidery Stitches 3.1 Material required for Indian Hand Embroidery 3.2 Design and colour combination used in Hand Embroidery 3.3 Basic Hand Embroidery Stitches- Running, Back, Stem, Lazy-Dazy, Chain, French Knot, Feather, Bullion, Satin, Buttonhole and Herringbone Stitch	10
Module 4	Traditional Indian Hand Embroideries History, Motiffs, Colour Combinations, Types of Threads and Stitches used in- 4.1Kantha of West Bengal 4.2 Kasuti of Karnataka 4.3 Chikankari of Utter Pradesh 4.4 Kaida of kashmir	20

Practicals:

Practical lectures: 60

1. Material used in Indian Hand Embroidery.

2. Selection, drawing and tracing of motiffs.

3. Preparation of embroidery samples of the following Stitches:

Running, Back, Stem, Lazy-Dazy, Chain, French Knot, Feather, Bullion, Satin, Buttonhole and Herringbone Stitch

4. Preparation of samples of the following:

1. Kantha of West Bengal
2. Kasuti of Karnataka
3. Chikankari of Uttar Pradesh
4. Phulkari of Panjab

Reference books:

1. The Costumes and Textiles in India, By Bhushan Brij Jamila, 1958,
2. D.B.Taraporwala Sons and Co. Ltd, Bombay
3. The Kanthas of Bengal, By Dhamija Jasleen , 1971, The Times of India Annual.
4. Indian Embroideries, By Irwin and Hall, published by S.R.Bastikar, P.B. 28, Ahmedabad
5. Kasuti of Karnataka, By Joshi Indira Popular prakashan , Bombay,1963
6. Indian Embroidery By Savitri Pandit
7. Traditional Indian Textiles by Parul B. Abhishek Publications
8. Colourful Textiles of Rajasthan by Gulab Kothari Jaipur Printers

Additional readings:

- 1 Bajaj Amrit ,Creating Sketching for Embroidery,Sonali Publications New Delhi.
- 2 Naik Shailaja,Traditional embroideries of India,A.P.H.Publishing Corporation New Delhi.
- 3 Irwin and Hall, Indian Embroideriespublished by S.R.Bastikar, P.B. 28, Ahmedabad
- 4 Joshi Indira .Kasuti of Karnataka1963Popular prakashan , Bombay
- 5 .Parul B. . Traditional Indian Textiles Abhishek Publications
6. Dhamija Jasleen The Kanthas of Bengal 1971, The Times of India Annual.
7. Kothari Gulab. Colourful Textiles of Rajasthan, Jaipur Printers
- 8 The Costumes and Textiles in India, By Bhushan Brij Jamila, 1958,
- 9 D.B.Taraporwala Sons and Co. Ltd, Bombay
- 10 Indian Embroidery By Savitri Pandit
- 11 Choudapurkar Anita, कर्नाटकी कशिदा, स्वाती प्रकाशन, पुणे, २०१०
- 12 Tyagi Anita, Traditional Indian textiles, Sonali Publications, New Dehil, 20

B.A. Part-III CBCS
Semester - VI Paper - XIV
Introduction to Guidance and Counselling (DSC -1023 F3)
Theory - Credits - 4

Course Outcomes: On completion of the course Students will be able to
 CO 1. Understand the basic concepts of guidance and counselling and its importance
 CO2. Know the qualities and skills of a good counsellor
 CO3. Aware of the ethical and professional issues
 CO4. Understand the process of counselling

Modules	Theory and Practical	Teaching hours
Module 1	Introduction to Guidance and Counselling 1.1 Definition and importance of Guidance and Counselling, difference between guidance and counselling. 1.2 Goals of Counselling 1.3 Professional and Ethical Issues 1.4 Characteristics and skills of a counsellor	15
Module 2	Counselling Process and techniques. 2.1 Preparation of Counselling 2.2 Counselling relationship 2.3 Techniques of counselling. 2.4 Factors affecting the counselling process	15
Module 3	Educational Counselling 3.1 Counselling the Elementary school child 3.2 Counselling High school child 3.3 Counselling college student 3.4 Role of teacher in Counselling	15
Module 4	Counselling Application 4.1 Family Counselling 4.2 Pre-marital and Marital Counselling 4.3 Career Counselling 4.4 Counselling for special children's.	15

Sessional work:

10 Marks

1. Preparation of resource file.
2. Visit to family court/ counselling centres/ counselling centers for special children's and report writing

References:

1. Rao N.S. (2006), *Counselling and Guidance*, ISBN 0-07-460474-0, Tata McGraw Hill Publishing Co. Ltd., New Delhi, India
2. Gibson L.R., Mitchell H.M. (2005), *Introduction to Counselling and Guidance*, ISBN 81-297-1029-3, Pearson Education (Singapore) Pvt. Ltd., New Delhi India.
3. "Marriage and Family in India", Kapadia K.M., Oxford University Press, Bombay.
4. *Marriage and Family Development*, Durall, E.M. (1977), Lippincott Co., Philadelphia.
5. *Courtship, Marriage and Family*, Dyer E.D. (1983), American Style, The Dorsey Press, Illinois.
6. *Personal Adjustment, Marriage and Family*, Landis J.T. and Landis M.G., Prentice Hall International INC. 1975.
7. *Encyclopedia of Marriage and Family*.
8. *The family, its structures and functions*, Coser Rose (1975). Mcmillion Publication, New York.
9. *Counselling Psychology*, Narayanrao S. (1991), 2nd edition, Reprint 2001, Tata McGraw Hill Publishing Company, New Delhi.
10. *The Indian Family in Transition*, Augustine, J.S., Vikas Publishing House, New Delhi.
11. *Family and its relationship*, Skinner
 - a. **Periodicals:**
 1. *Journal of Home Science*, Vadodara
 2. *Research Reach*, SNDT, Mumbai
 3. *Family*

B.A. Part-III CBCS
Semester - VI Paper - XV
ENTREPRENEURSHIP DEVELOPMENT (DSC- 1023 F4)
Theory - Credits - 4

COURSE OUTCOMES: On completion of the course Students will be able to:

CO1 Understand the concept of entrepreneurship

CO2 Prepare project proposal for new enterprise

CO3 Understand the policies and schemes of Go's and NGO's regarding startup of enterprise

CO4 Acquire entrepreneurship skills

Modules	Content	Teaching hours
Module 1	Entrepreneur 1.1 Meaning and Definition of Entrepreneur 1.2 Qualities of Successful Entrepreneur 1.3 Types of Entrepreneur 1.4 Obstacles to Become an Entrepreneur 1.5 Challenges Before existing Entrepreneur	15
Module 2	Entrepreneurship Development 2.1 Entrepreneurship - Concept, Definition and Importance 2.2 Entrepreneurship Development -Concept, Objective and Scope 2.3 Process of Entrepreneurship Development 2.4 Problems of Entrepreneurship Development	15
Module 3	Women Entrepreneurship 3.1 Concept and Functions of Women Entrepreneurship 3.2 Qualities of Women Entrepreneur 3.3 Problems and Remedies for Women Entrepreneurship 3.4 Recent Trends in Women Entrepreneurship	15
Module 4	Entrepreneurship Through Home Science Education 4.1 Scope of Home Science Education for Entrepreneurship 4.2 Micro ,Small and Medium Enterprises - Definition, Importance, Problems 4.3 Policies and Schemes for Micro, Small and Medium Enterprises	15

PRACTICALS:

60

Practical 1. Preparation of detail Project Report on any related topic

Practical 2. Study Visit to any Small or Large Scale Industry

Practical 3. Interview of Successful Women Enterprises in the Relevant Field

Practical 4. One week training for skill development in any field and submission of report

References books:

1. Taneja and Gupta S.L., Entrepreneurship Development, New Venture Creation ,Galgeha Publication Company, New Delhi.
2. Desai V.,Entrepreneurship Development, Himalaya publication House, Mumbai.
3. Khanna and Chand Company Ltd., Entrepreneurial Development, Ram Nagar New Delhi.
4. Deshpande Manohar Entrepreneurship of Small Scale Industries, Deep and Deep Publication New Delhi.
5. Dr.A.K.Gawai, Fundamentals of Entrepreneurship- Fadake Prakashan ,Kolhapur.
6. सुधीर सेवेकर,उद्योजगता , संकल्पना आणि प्रेरणा
7. डॉ.जितेंद्र अहिरराव उद्योजकता, चिन्मय प्रकाशन औरंगाबाद
8. डॉ. शहा एन. व्ही.,उद्योजकतेची मुलतत्वे, निराली प्रकाशन, पुणे

PERIODICALS:

1. Maharashtra Journal of extension education.
2. उद्योजक MITCON, AURANGABAD .
3. संपदा , मराठा चेंबर ऑफ कॉमर्स , मुंबई.

B.A. Part-III CBCS
Semester - VI Paper - XVI
Extension for Development (DSC -1023 F5)
Theory - Credits - 4

Course Outcomes: On completion of the course Students will be able to:

- CO1. Understand the concept of extension for development
- CO2. Apply the principles and use of extension teaching methods
- CO3. Utilize the means of communication for extension development
- CO4 Apply the knowledge in day-to-day life.

Modules	Content	Teaching hours
Module 1	Education & Communication 1.1 Teaching - Definition and Principles 1.2 Learning - Definition and Principles 1.3 Education - Definition, Meaning and Types	15
Module 2	Extension Education 2.1 Introduction, Definition and Objectives 2.2 Principles of Extensions education 2.3 Extension Education process 2.4 Extension workers: Definition and Qualities	15
Module 3	Extension Teaching Methods 3.1 Definition and Classification of Extension Teaching methods 3.2 Individual Contact Methods - Farm & home visit, Telephone call, Personal letters 3.3 Group Contact Methods - General meeting, Lecture, Demonstration, Workshop, Seminar, Conferences, Symposium 3.4 Mass contact methods - Radio, TV, Film shows, Puppet show, Drama, Street play	15
Module 4	Means of Communication in Extension Education 4.1 Communication - Definition, Process, Types 4.2 Audio visual aids - Meaning and Classification 4.3 Non projected Aids: Posters, Boards, Graphs, Charts, Flash cards, Exhibition, Booklets and Models 4.4 Projected Aids: LCD, Interactive board 4.5 Means of Advance Communication : ICT and Social Networking	15

Sessional Work:

1. Preparation of Chart /Poster
2. Preparation of Flash card/Folder
3. Preparation of Booklet/Model

References books:

1. Dhama O.P. and Bhatnagar O. P., (2003), Education for Communication, New
2. Kumar and Hansra, (1997), Extension Education for Human Resource Development, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi
3. Barker, L. (1990), 'Communication', New Jersey, Prentice Hall, Inc, 171
4. Devito, J. (1998), Human Communication, New York; Harper and Row
5. Patri and Patri (2002); Essentials of Communication, Greenspan Publications
6. A. Adivi Reddy, Extension Education
7. A. S. Sandhu, Text Book on Agricultural Communication
8. वैरागडे, मुळे (२०१२) सामुदायिक विकास, विस्तार शिक्षण व महिला सबलीकरण विद्या बुक्स पब्लिशर्स औरंगाबाद.
9. फरकाडे , गोंगे (२००२) गृहविज्ञान विस्तार विद्या प्रकाशन नागपूर.

B.A. Part-III CBCS
Semester - VI
Bakery Science (Elective)
Theory - Credits - 3

Course Outcomes: On completion of the course Students will be able to

- CO1. Understand the knowledge of bakery Science.
- CO2. Apply the techniques of cake, pastry and biscuit in own bakery business.
- CO3. Understand the concept of Food Safety.
- CO4 understand the concept of cost Control.

Modules	Content	Teaching hours
Module 1	Bakery Industry Bakery industry and its scope in the Indian economy. Present Trends and Prospects.	05
Module 2	Cake and Pastry Science Preparation of cakes - types of cakes Ingredients used ; methods of batter Preparation ; steps in cake making ;balancing of Operational faults in cake Processing and the remedial measures Preparation of Pastry - types of Pastries (Short Crust Puff / Flaky and choux Pastry) ; ingredients; Processing and evaluation Faults and remedies.	20
Module 3	Biscuit and Cooking Science Preparation of biscuits and cooking Types ; ingredients Processing and evaluation.	10
Module 4	Food Safety & cost Control Key terms , factors affecting food Safety. Food additives used in baking. Cost control - food cost labour cost & other costs.	10

PRACTICAL

PRACTICAL LECTURES : 60

Objective : To equip Students With the necessary skill for cake biscuits and Pastry Processing.

1. Weights and measures selection of raw material.
2. Preparation Sensory evaluation and Packaging of cakes

- Fatless sponge cakes
- Shortened cakes
- Eggless cakes
- Muffins and brownies

3. Preparation sensory evaluation and Packaging of Pastries

- Short crust
- Puff / flaky
- Choux pastry

4. Preparation sensory evaluation and Packaging of biscuits

Reference books:

1. Dubey SC Basic Baking Science and Craft Society of Indian Bakers ,Delhi 2007.
2. Encyclopedia of Food Science and Technology ,Academic Press.1993.
3. Khanna K Gupta s, Seth R, Mahana R, Rekhi T. The Art and Science of Cooking Phoenix Publishing House Private Limited ,Delhi. 2004.
4. Matz A. Bakery Technology and Engineering CBS Publishers,Delhi 1998.

B.A. Part-III CBCS
Semester - VI
SEC IV: Home Based Catering - II (SEC- AF)
Theory - Credits - 2

Course outcomes: On completion of the course, students will be able to:

- CO1. Understand types of food service systems
- CO2. Understand resources required for food service systems
- CO3. **How to plan and make a good project proposal**
- CO4. Understand marketing and selling strategies

Modules	Content
Module 1	Food Service Systems Types of food service systems a) Conventional b) Commissary c) Ready prepared d) Assembly/serve. Do's & Don'ts in home-based catering
Module 2	Resources Money Manpower Time Facilities and equipment Utilities
Module 3	Planning of A Food Service Unit Preliminary Planning Survey of types of units, identifying customers, menu, operations and delivery Planning the set up: a) Identifying resources b) Developing Project plan c) Determining investments d) Project Proposal
Module 4	Marketing & Selling strategies a) Marketing strategies - 1. Product strategy 2. Service strategy 3. Pricing strategy b) Selling Strategies -

- | | |
|--|--|
| | <ol style="list-style-type: none">1: Build a Genuine Relationship with Your Prospect.2: Give Before You Take.3: Demonstrate Your Expertise and Credibility.4: Use Time-Based Deadlines. |
|--|--|

Reference Books:

1. West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised
2. By Hargar FV, Shuggart SG, &Palgne Palacio June, Macmillian Publishing Company
3. New York.
4. Sethi Mohini (2005) Institution Food Management New Age International Publishers
5. Knight J B &Kotschevar LH (2000) Quantity Food Production Planning &
6. Management 3rd edition John Wiley & Sons
7. Philip E Thangam (2008) Modern Cookery for teaching and Trade Part I & II Orient Longman
8. Taneja S and Gupta SL (2001) Entrepreneurship development, Galgotia Publishing

“Dissemination of Education for Knowledge, Science and Culture”

- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)**



DEPARTMENT OF GEOGRAPHY

**B.A. Part - III
Semester- V & VI**

SYLLABUS

Under Choice Based Credit System

To be implemented from 2020-21

B. A. Part - III CBCS
Semester - V Paper- VII
Evolution of Geographical Thought (DSC 1022 E1)

Theory: 40 Hours

Credits -4

1. Course Outcomes: -

CO1 Students should be able to understand in-depth knowledge about the Evolution of Geographical Thoughts.

CO2 Students should be able analyses recent trends in geography.

CO3 Students should be able to make use of various models of paradigms and debates in geographical study.

CO4 Students should be able classify the concepts of different schools of geographic thoughts.

Module	Evolution of Geographical Thought	Lectures
Module I	Geography in Ancient Period	15
	1.1 Contribution of Greeks and Romans 1.2 Contribution of Arab Geographers 1.3 Renaissance period in Europe 1.4 Renowned travelers and their geographical discoveries	
Module II	School of Geography	15
	2.1 German School of Geography - Humboldt, Ritter. 2.2 French School of Geography - Blache & Brunhes. 2.3 American School of Geography - Sauer & Huntington. 2.4 British School of Geography - Mackinder & Herbertson	
Module III	Dualisms in Geography	15
	3.1 Environmental Determinism and Possibilism. 3.2 Systematic & Regional geography. 3.3 Physical & human geography 3.4 The myth and reality about dualisms	
Module IV	Trends in Geography	15
	4.1 Quantitative Revolution and its Impact 4.2 Changing Concept of Space in Geography 4.3 Contribution of Ancient Indian Geographer 4.4 Contribution of Modern Indian Geographer	

References:-

- Adhkari, S. (2006) Fundamentals of Geographical Thought, Chaitanya Publishing House, Allahabad
- Bunkse, V.E. (2004) Geography and the art of Life, John Hopkins University Press, Baltimore, Dikshit, R. D. (1997). Geographical Thought: A Contextual History of Ideas. Delhi,
- India: Prentice- Hall India.
- Dixit, R.D. (2001) Geographical Thought : A critical History of ideas, Prentice Hall of India, New Delhi
- Dixit, R.D. (2001) भौगोलिक चिंतन, Prentice Hall of India, New Delhi
- Gaile, G. and Wilmot, C. (ed) (2003) Geography in America at the Dawn of the 21st Century, Oxford University Press, Oxford & New York.
- Harvey, David., (1969): Explanation in Geography, London: Arnold.
- Hubbard, P. et al (2002) Thinking Geographically : Space, Theory and Contemporary Human Geography, Continuum, London
- Johnston, R.J. (1988) The Future of Geography, Methuen, London,
- Johnston, R.J. and Claval, P. (1984) Geography since the Second World War : An International survey, Crown Haim, Sydney.
- Majid Husain (2007): Evolution of Geographic Thought Rawat Publication, Jaipur
- Marcus, D. (1999) Post - Structuralism in Geography, The Diabolical Arts of Spatial Sciences, Edinburgh University Press, Edinburgh.
- Martin Geoffrey J. (2005). All Possible Worlds: A History of Geographical Ideas, UK:Oxford.
- Singh, R.B. (2016). Progress in Indian Geography. New Delhi, India: Indian National Science Academy.
- Sudepta, A. (2015). Fundamentals of Geographical Thought. Delhi, India: Orient black swan private limited.
- e-PG Pathshala: <https://epgp.inflibnet.ac.in/>
- MOOCS - NPTEL: <https://nptel.ac.in/>
- MOOCS - SWAYAM: <https://swayam.gov.in/>
- National Digital Library of India: <https://ndl.iitkgp.ac.in/>
- Shivaji University Library (E-Resources): <http://www.unishivaji.ac.in/library/E-Resources>

**B. A. Part - III CBCS
Semester - V Paper- VIII
Geography of India (DSC 1022 E2)**

Theory: 60 Hours

Credits -4

1. Course Outcomes:-

CO1 Students should be able to understand significance of location in geography.

CO2 Students should be aware about mechanism of monsoon and seasons in India

CO3 Students should be able to relate the knowledge with the present climatic and weather conditions.

CO4 Students should acquire detailed knowledge about soils, vegetation's, drainage systems in India, agriculture and industry in Indian economy.

Module	Geography of India	Lectures
Module I	Physical Profile of India	20
	1.1 Location 1.2 Physiographic Divisions (Characteristics and Importance) 1.3 Climate: Mechanism of Indian Monsoon, Seasons in India: Summer, Rainy and Winter (Weather conditions and Characteristics) 1.4 Major Drainage Systems: Ganga, Brahmaputra, Narmada, Godavari, Krushna (Characteristics and Importance)	
Module II	Soils and Forests	14
	2.1 Major soil types and distribution in India. 2.2 Soil degradation and soil conservation in India. 2.3 Major forest types and their distribution. 2.4 Deforestation and conservation of forests in India	
Module III	Mineral and Power Resources	13
	3.1 Conventional Resources: Iron Ore and Manganese (Distribution, Production and Trade) 3.2 Power Resources: Coal, Mineral Oil, Natural Gas (Distribution, Production and Trade). 3.3 Non Conventional Resources: Solar and Wind (Distribution, Production and Trade)	
Module IV	Agriculture and Industry	13
	4.1 Importance of Agriculture in Indian Economy	

	<p>4.2 Major Crops: Rice, Sugarcane and Cotton (Distribution, Production and Trade)</p> <p>4.3 Importance of Industries in Indian Economy</p> <p>4.4 Industries: Location Factors, Sugar Industry, and Iron and Steel Industry,(Distribution, Production and Trade)</p>	
--	---	--

References:-

1. Majid H., (2013): Geography of India, Tata Mcgraw Hill Education (India) Private Limited, New Delhi.
2. Khullar R. D. (2007): India- A Compressive Geography, Kalayani Publisher.
3. Tiwari, R.C. (2007) Geography of India. Prayag Pustak Bhawan, Allahabad.
4. Singh R. L., (1971): India: A Regional Geography, National Geographical Society of India.
5. Deshpande C. D., (1992): India: A Regional Interpretation, ICSSR, New Delhi.
6. Johnson, B. L. C., ed. (2001). Geographical Dictionary of India. Vision Books, New Delhi.
7. Mandal R. B. (ed.), (1990): Patterns of Regional Geography - An International Perspective. Vol. 3 -Indian Perspective.
8. Sdyasuk Galina and Sengupta P., (1967): Economic Regionalisation of India, Census of India
9. Sharma, T. C. 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi.
10. Singh, J., (2003),: India - A Comprehensive & Systematic Geography, Gyanodaya Prakashan, Gorakhpur.
11. Spate O. H. K. and Learmonth A. T. A., (1967): India and Pakistan: A General and Regional Geography, Methuen.
12. Tirtha, R., (2002): Geography of India, Rawat Publs., Jaipur & New Delhi.
16. Pathak, C. R. (2003): Spatial Structure and Processes of Development in India. Regional Science Assoc., Kolkata.
17. Sharma, T.C. (2013): Economic Geography of India. Rawat Publication, Jaipur.
18. Savadi, Kolekar: Bharatacha Samarag Bhugol, Nirali Prakashan, Pune.
19. Khatib K. A.,: Geography of India
20. Pawar C.T. & Others : Geography of India.
21. Soil and Water conservation manual Govt. of India.

**B. A. Part - III CBCS
Semester - V Paper- IX**

Population Geography¹ or Social Geography² (DSC 1022 E3)

Theory: 60 Hours

Credits -4

1. Course Outcomes of Population Geography¹: -

CO1 Students should be able to understand basics of population study, population growth trends and its distribution.

CO2 Students should understand population geography along with relevance to the demographic data, understanding of distribution and trends of population growth in the developed and less developed countries, along with population theories.

CO3 Students should be able to make use of various models and understanding of the implications of population composition in different regions of the world and get an appreciation of the contemporary issues in the field of population studies

CO4 Students should be able to compare and relate population dynamics.

2. Course Outcomes of Social Geography²:-

CO1 Students should be able to understand the problems and prospects of society in India.

CO2 Students should be aware about the migration, technological and occupational changes in India peoples

CO3 Students should be able to compare a detailed knowledge about the social categories and communities in world.

CO4 The students would get an understanding of concepts of social well-being and welfare.

Module	Population Geography¹	Lectures
Module I	Introduction to Population Geography	15
	1.1 Definition, Nature and scope of Population Geography 1.2 Significance of Population Geography 1.3 Sources of Population Data	
Module II	Population Growth and Distribution	15
	2.1 World Population Growth 2.2 Factors affecting on population distribution. 2.3 Population distribution of the world 2.4 Theories of Population Growth: Malthus Theory and Demographic Transition Theory	
Module III	Population Dynamics and Pandemics	15
	3.1 Concept of Population Dynamics and Pandemics	

	3.2 Effects of Covid 19 on Fertility, Mortality and Migration 3.3 Fertility: Causes, Effects and Measures 3.4 Mortality: Causes, Effects and Measures 3.5 Migration: Causes, Effects and Measures	
Module IV	Population Composition and Characteristics	15
	4.1 Age: Causes, Effects, Measures and Characteristics 4.2 Sex: Causes, Effects, Measures and Characteristics 4.3 Literacy: Causes, Effects, Measures and Characteristics 4.4 Rural and Urban Composition: Causes, Effects and Characteristics	

References:-

- 1.Barrett H. R., 1995: Population Geography, Oliver and Boyd.
- 2.Bhende A. and Kanitkar T., 2000: Principles of Population Studies, Himalaya Publishing House.
- 3.Chandna R. C. and Sidhu M. S., 1980: An Introduction to Population Geography, Kalyani Publishers.
- 4.Clarke J. I., 1965: Population Geography, Pergamon Press, Oxford.
- 5.Jones, H. R., 2000: Population Geography, 3rd ed. Paul Chapman, London.
- 6.Lutz W., Warren C. S. and Scherbov S., 2004: The End of the World Population Growth in the 21st Century, Earthscan
- 7.Newbold K. B., 2009: Population Geography: Tools and Issues, Rowman and Littlefield Publishers.
- 8.Pacione M., 1986: Population Geography: Progress and Prospect, Taylor and Francis.
- 9.Wilson M. G. A., 1968: Population Geography, Nelson.
10. Panda B P (1988): Janasankya Bhugol, M P Hindi Granth Academy, Bhopal
11. Maurya S D (2009) Jansankya Bhugol, Sharda Putak Bhawan, Allahabad
12. Chandna, R C (2006), Jansankhya Bhugol, Kalyani Publishers, Delhi
14. Trewartha, G T (1969), A Geography of Population: world patterns, John Wiley, New York.
15. e-PG Pathshala: <https://epgp.inflibnet.ac.in/>
16. MOOCS - NPTEL: <https://nptel.ac.in/>
17. MOOCS - SWAYAM: <https://swayam.gov.in/>
18. National Digital Library of India: <https://ndl.iitkgp.ac.in/>
19. Shivaji University Library (E-Resources): <http://www.unishivaji.ac.in/library/E-Resources>

Module	Social Geography²	Lectures
Module I	Introduction of Social Geography	15
	1.1 Definitions, Nature and Scope of Social Geography 1.2 Relationship between Social Geography and other Social Sciences 1.3 Approaches of Social Geography 1.4 Significance of Social Geography	
Module II	Peopling Process of India	15
	2.1 Educational Changes 2.2 Technological Changes. 2.3 Occupational Changes 2.4 Migration	
Module III	Social Categories and their Spatial Distribution	15
	3.1 Race 3.2 Religions 3.3 Gender	
Module IV	Population Composition and Characteristics	15
	4.1 Concept of Social Welfare and Well being 4.2 Healthcare and Housing Facilities 4.3 Slums 4.3 Communal Conflicts and Crime	

References:-

1. Ahmed A., 1999: Social Geography, Rawat Publications.
2. Casino V. J. D., Jr., 2009) Social Geography: A Critical Introduction, Wiley Blackwell.
3. Cater J. and Jones T., 2000: Social Geography: An Introduction to Contemporary Issues, Hodder Arnold.
4. Holt L., 2011: Geographies of Children, Youth and Families: An International Perspective, Taylor & Francis.
5. Panelli R., 2004: Social Geographies: From Difference to Action, Sage.
6. Rachel P., Burke M., Fuller D., Gough J., Macfarlane R. and Mowl G., 2001: Introducing Social Geographies, Oxford University Press.
7. Smith D. M., 1977: Human geography: A Welfare Approach, Edward Arnold, London.
8. Smith D. M., 1994: Geography and Social Justice, Blackwell, Oxford.
9. Smith S. J., Pain R., Marston S. A., Jones J. P., 2009: The SAGE Handbook of Social Geographies, Sage Publications.
10. Sopher, David (1980): An Exploration of India, Cornell University Press, Ithasa.
11. Valentine G., 2001: Social Geographies: Space and Society, Prentice Hall

B. A. Part - III CBCS
Semester - V Paper- X
Economic Geography (DSC 1022 F1)

Theory: 60 Hours

Credits -4

1. Course Outcomes:-

CO1 Students should be able to get in-depth knowledge about basic concepts in economic geography.

CO2 Students should be able to understand importance of location factor in economic activities with special reference to agriculture and industry.

CO3 Students should be able to enhance detailed understanding of the basics concepts related to manufacturing and major manufacturing industries (selected countries) of the world.

CO4 Students should be able classify the transport and trade

Module	Economic Geography	Lectures
Module I	Introduction to Economic Geography	15
	1.1 Definition, Nature and Scope 1.2 Concept and Classification of Economic Activity 1.3 Branches of Economic Geography 1.4 Significance of Economic Geography	
Module II	Concept and Theories in Economic Geography	18
	2.1 Concept of Manufacturing Regions 2.2 Concept of Special Economic Zones 2.3 Weber's Theory of Industrial Location 2.4 Major Industries: i) Iron and Steel Industry - USA ii) Automobile Industry - India and Japan	
Module III	Trade, Transport and Industries	15
	3.1 Significance of Transportation 3.2 Major Transport Routs: Roadway, Railway, Airway and Ocean Routs 3.3 International Trade: India, USA 3.4 Trade Policies: India and USA	
Module IV	Impact of Covid 19 on Economic Activities	12
	4.1 Agricultural Activity 4.2 Industrial Activity 4.3 Tourism Activity	

References:-

- Alexander J. W., (1963): Economic Geography, Prentice Hall Inc Englewood Cliffs, New Jersey.
- Boesch H. (1964) : A Geography of world Economy" D. Van Nostrand co. New York.
- Coe N. M., and others, (2007): Economic Geography: A Contemporary Introduction, Wiley-Blackwell.
- Combes P., Mayer T. and Thisse J. F., (2008) Economic Geography: The Intergration of Regions and Nations, Princeton University Press.
- Goh Chang & Morgan, G.C. (1997): Human and Economic Geography, Oxford University Press.
- H. Robinson (1978): Economic Geography, Macdonald & Evans.
- Hamilton, I (1992) : Resources and Industry, Oxford University Press New York.
- Hartshorn, T.N. and Alexander, J.W. (1994): Economic Geography, Prentice Hall, New Delhi.
- Hodder B. W. and Lee Roger, (1974): Economic Geography, Taylor and Francis.
- Meyer, B. S., Anderson, D. B. and Bohning, R. H. (1960): An Introduction to Plant Physiology, Van Nostrand Company, New York.
- Roborston D (2001) : Globalization and Environment E. Elgar CO.U.K.
- Sadhukhan S. K., (1990): Economic Geography An Appraisal of Resources, S. Chand and Company Ltd., New Delhi.
- Truman A. Hartshorn and John W. Alexander, (1988): Economic Geography, PHI Learning Private Limited, New Delhi.
- Walker, D. F., Collins, L. (Eds.), (1975): Locational Dynamics of Manufacturing Activity, John Wiley and Sons, New York.
- Wheeler J. O., (1995) : Economic Geography John Wiley, New York.
- White H.P. and Senior M.L. (1983) Transport Geography, Longman, London.
- Willington D. E., (2008): Economic Geography, Husband Press.
- Zimmermann, E. W., (1933): World's Resources and Industries, Harper and Row, New York.

NOTE :

- i) The details of field work, seminar, Group Discussion and Oral examination be given wherever necessary.
- ii) General/Specific instructions for Laboratory safety should be given wherever necessary.

B. A. Part - III CBCS
Semester - VI Paper- XI
Urban Geography¹ or Regional Planning & Sustainable Development²
(DSC 1022 F2)

Theory: 60 Hours

Credits -4

1. Course Outcomes of Urban Geography¹:-

CO1 Students should be able to understand significance of the importance of urban settlements through urban geography

CO2 Students should be able to compare and relate types of Urban Settlements, Site and Situations

CO3 Students should be familiar with an idea of relationship between human activities and urban development.

CO4 Students should be able understand the issues regarding present urban problems and will be capable of handling present problematic situations in urban areas and will become as a good urban planner and environmental conservator

2. Course Outcomes of Regional Planning & Sustainable Development²:-

CO1 Students should be able to understand importance of regional planning

CO2 Students should be able to understand the concepts of region, regionalization, regional planning and development.

CO3 Students should be familiar with indicators of measurements of development and will be able to implement this measures in the development process of a region.

Module	Urban Geography ¹	Lectures
Module I	Introduction to Urban Geography	15
	1.1 Urban Geography Introduction: Meaning and Definitions 1.2 Nature of Urban Geography 1.3 Scope of Urban Geography 1.4 Significance of Urban Geography	
Module II	Urbanization	15
	2.1 Site and Situation: Significance and Types 2.2 Concept and Factors of Urbanization 2.3 Patterns of Urbanization in developed and developing countries. 2.4 Functional classification of cities (Quantitative and Qualitative).	
Module III	Structure and Morphology of Urban Centers	15
	3.1 Concept of Structure and Morphology 3.2 Concept of City Region and C.B.D.	

	3.3 Rural-Urban Fringes 3.4 Models of Town Morphology: The concentric Zone Theory, The Sector Theory and the Multi-Nuclei Theory.	
Module IV	Urban Problems and Issues	15
	4.1 Urban Issues: problems of housing, slums, civic amenities (water and transport) 4.2 Concept of Garden City 4.3 Metropolitan Issues: Delhi and Mumbai 4.4 Urban problems in Kolhapur City	

References:-

1. Tim Hall. (1998) : Urban Geography, Routledge ,London.
2. Verma L.N.: Urban Geography, Rawat Publications, Jaipur.
3. Johnson J. H. (1967) : Urban Geography, An Introductory Analysis.
4. Bose A., : India's Urbanization 1974-2000, Tata McGraw Hill, New Delhi.
5. Carter H. (1972): The study of urban Geography, Edward Arnold, London.
6. Smailes A. E. : The Geography of Towns.
7. Taylor and Pntnam : Geography of Urban Places.
8. Hudson F : Settlement Geography

Module	Regional Development and Sustainable Development²	Lectures
Module I	Region and Regionalization	15
	1.1 Definition of Region and Regionalization 1.2 Characteristics of Region 1.3 Types of Region 1.4 Demarcation of Region	
Module II	Regional Planning	15
	2.1 Concept of Regional Planning 2.2 Need for Regional Planning and Types of Regional Planning 2.3 Choice of a Region for Planning 2.4 Planning regions of India	
Module III	Models for Regional Planning	15
	3.1 Spread and Backwash concept. 3.2 Central Place Theory 3.3 Growth Pole Model of Perroux 3.4 Growth Foci of K. P. Mishra	

Module IV	Sustainable Development	15
	4.1 Concept of Sustainable Development and Underdevelopment 4.2 Rostow's Growth Model- Stages of Development 4.3 An Indicators of Measuring Development 4.4 Human Development Index (HDI)	

References:-

1. Alden, J. and Morgan, (1974): Regional Planning: A Comprehensive View, Leonard Hill Books, Beds.
2. Adrill, J. (1974): New Citizens Guide to Town and Country Planning, Charies knight and Company Ltd. London.
3. Chand, M. & Puri, V. (1983): Regional Planning in India, Allied Publishers Ltd., New Delhi.
4. Chandra, R.C. (2000): Regional Planning and Development, Kalyani Publishers, Ludhiana.
5. Cook. P. (1983): Theories of Planning and Spatial Development, Hutchinson & Company Ltd. London.
6. Diamond, D. (ed) (1982): Regional Disparities and Regional Policies, Pergamon Press, Oxford.
7. Dickinson R.E. (1964): City and Region: A Geographical Interpretation. Routledge and Keagan Paul.
8. Friedman, J. & Alonson W. (1964): Regional Development and Planning. MIT Press. Cambridge.
9. Galasson, John (1974): An Introduction to Regional Planning Hutchinson. Educational London.
10. Hilborot, J.G.M (1971): Regional Planning. Rotterdam University Press, Rotterdam.
11. Misra, R.P. Sundaram K.V. & Rao, V.L.S. Prakasa (1974): Regional Development Planning In India.
12. Misra, R.P. (1992): Regional Planning. Concept Publishing Company. New Delhi.
13. Reddi, K. V. (1988): Rural Development in India, Himalaya Pub, Mumbai.
14. Singh, R.L.(2008): Fundamentals of Human Geography, Sharada Pustak Bhawan, Allahabad.

	3.1 Heartland Theories - H. J. Mackinder 3.2 Rimland Theorie - N. J. Spykeman	
Module IV	Resource Conflicts and Disputes	18
	4.1 Krishna Water Conflict (Inter Satate) 4.2 Ganga Water Conflict (International) 4.3 Issues of Relief, Compensation and Rehabilitation: Chandoli Projects 4.4 Issue of Maharashtra-Karnataka Boundary	

References:-

1. Adhikari, S. (1997): Political Geography, Rawat Publications, Jaipur.
2. Disshit, R. D. (1985) : Political Geography, A Contemporary Perspective, McGraw Hill, New Delhi
3. Dwivedi, R. L. (1996): Political Geography, Chaitanya Prakashan, Allahabad.
4. Muir, Richard (1995): Modern Political Geography, Macmillan, London.
5. Pounds, N. J. G. (1972): Political Geography 2nd Ed. McGraw Hill, N. Y.
6. Sharma, T. C.: Political Geography.
7. Agnew J., 2002: Making Political Geography, Arnold.
8. Agnew J., Mitchell K. and Toal G., 2003: A Companion to Political Geography, Blackwell.
9. Cox K. R., Low M. and Robinson J., 2008: The Sage Handbook of Political Geography, Sage Publications.
10. Cox K., 2002: Political Geography: Territory, State and Society, Wiley-Blackwell
11. Gallaher C., et al, 2009: Key Concepts in Political Geography, Sage Publications.
12. Glassner M., 1993: Political Geography, Wiley.
13. Jones M., 2004: An Introduction to Political Geography: Space, Place and Politics, Routledge.
14. Mathur H M and M M Cernea (eds.) Development, Displacement and Resettlement - Focus on Asian Experience, Vikas, Delhi

Module	Geography Of Health & Wellbeing²	Lectures
Module I	Perspectives on Health	15
	1.1 Definition and scope 1.2 Trends and applications 1.3 Linkages with environment and development 1.4 Health and Environmental trends: Population dynamics, urbanization, poverty and inequality	
Module II	Pressure on Environmental Quality and Health	15
	2.1 Human activities and environmental pressure 2.2 Land use and agricultural development 2.3 Industrialization 2.4 Transport	
Module III	Exposure and Health Risks	15
	3.1 Air and water pollution 3.2 Household wastes 3.3 Housing 3.4 Workplace	
Module IV	Health and Disease Patterns (In Environmental Context with special reference to India)	15
	4.1 Communicable diseases and their regional pattern - AIDS and Dengue 4.2 Ganga Water Conflict (International) 4.2 Lifestyle related diseases and their regional pattern - Cancer and Diabetes 4.4 Issues of Relief, Compensation and Rehabilitation: Chandoli Projects 4.3 Climate change and human health 4.4 Food production and nutrition	

References:-

1. Akhtar Rais (Ed.), 1990: Environment and Health Themes in Medical Geography, Ashish Publishing House, New Delhi.
2. Avon Joan L. and Jonathan A Patzed., 2001: Ecosystem Changes and Public Health, Baltimin, John Hopling Unit Press(ed).
3. Bradley, D., 1977: Water, Wastes and Health in Hot Climates, John Wiley Chichesten.
4. Gatrell, A., and Loytonen, 1998: GIS and Health, Taylor and Francis Ltd, London.

5. Gatrell A., and S. Elliott. 2009. *Geographies of health*. Chichester, UK: Wiley-Blackwell.
6. Gesler, W., and W. Kearns. 2002. *Culture place and health*. Critical Geographies. London: Routledge.
7. Hardham T. and Tannav M., (eds): *Urban Health in Developing Countries; Progress, Projects, Earthgoan*, London.
8. Jones, K., and G. Moon. 1987. *Health disease and society*. London: Routledge.
9. Meade, M., and R. Earickson. 2000. *Medical geography*. New York: Guildford.
10. Murray, C. and A. Lopez, 1996: *The Global Burden of Disease*, Harvard University Press.
11. Moeller Dadewed., 1993: *Environmental Health*, Cambridge, Harvard University Press.
12. Phillips, D. and Verhasselt, Y., 1994: *Health and Development*, Routledge, London.
13. Shelar, S.K., 2012: *Introduction to Medical Geography*, Chandralok Pub., Kanpur.

B. A. Part - III CBCS
Semester - VI Paper- XIII
Fundamentals of Map Making and Map Interpretation
(Practical Paper I)

1. Course Outcomes

CO1 Understand and acknowledge with Maps, Projections, scales, slopes,

CO2 Work and handle maps with relief features, weather instruments and IMP Maps

CO3 Craft diverse maps

CO4 Conduct nuanced analyses of weather reports, and proficiently operate geographical instruments with intelligence and precision.

Unit	Fundamentals of Map Making and Map Interpretation	Marks
Unit - 1	<p>1.1 Scale</p> <p>1.1.1 Meaning and Definition, 1.1.2 Methods of Representation of scale - Verbal, Numerical and Graphical. 1.1.3 Scale Conversion 1.1.4 Construction of Graphical Scale - i) Simple (Plane Scale) ii) Time and Distance Scale iii) Diagonal Scale</p> <p>1.2 Map</p> <p>1.2.1 Map - Definition, Elements 1.2.2 Classification of Maps: Based on Scale and Purpose 1.2.4 Significance and uses of Maps</p>	15
Unit - 2	<p>Map Projection</p> <p>2.1 Definition, Classification of Projections: a) Based on the methods of Construction: Perspective and Non-perspective b) Based on Developable Surface used: Conical, Cylindrical, Zenithal, Conventional. c) Based on Position of Tangent Surfaces: Polar, Equatorial (normal), Oblique. d) Based on Position of view point or light: Gnomonic, Stereographic, Orthographic</p>	15

	<p>e) Based on Preserved qualities: i) Equal area projection (Homolographic) i) Orthographic Projection ii) Azimuthal Projection (True Bearing Projection)</p> <p>2.2 Graphical Construction of the following Projections with Properties and Use: i) Zenithal Polar Gnomonic Projection ii) Zenithal polar Equidistant Projection iii) Zenithal Polar Equal Area Projection iv) Simple Conical Projection with one standard Parallel v) Mercator's Projection and Reference to Universal Transverse Mercator (UTM) Projection</p>	
Unit - 3	<p>Slope, Relief Features and Profile Analysis</p> <p>3.1 Slope and Gradient 3.1.1 Types of Slope: Gentle, Steep, Even, Uneven, Convex, Concave, Terraced. 3.1.2 Methods of Relief Representation i. Qualitative :- Hachures, Hill shading, Layer Tint ii. Quantitative:- Contours, Form lines, Spot Heights, Bench Marks, Triangulation Mark, Relative Height 3.1.2 Expression of Slopes: a) Gradient b) Degree c) Per Cent d) Mills 3.1.3 Representation of Relief by Contours: Hill, Mountain, Ridge, Cliff, Saddle, Plateau, Knoll, Spur, Col or Pass, Volcanic Col or Crater, Gorge, 'V' Shaped Valley, Waterfall, 'U' Shaped Valley, Cirque, Hanging Valley, Ria Coast, Fiord Coast, Sea cliff. 3.2 Profiles 3.2.1 Superimposed Profile 3.2.2 Composite Profile 3.2.3 Projected Profile 3.2.4 Longitudinal Profile</p>	15
Unit - 4	<p>Topographical Maps</p> <p>4.1 Development of Survey of India 4.2 Types or Indexing of S.O.I. Topographical Maps 4.3 Signs, Symbols and Colors used in SOI Toposheet</p>	15

	<p>4.4 Interpretation of S.O.I.'s Topographical Map (Mountain, Plateau and Plain)</p> <p>a) Marginal Information</p> <p>b) Physical environment: Relief, Drainage and Vegetation</p> <p>c) Cultural environment: Settlements, Transportation and Communication, Irrigation.</p> <p>d) Land Use</p>	
Unit 5	<p>Weather Instruments and IMD Maps</p> <p>5.1 Study of weather Instruments with reference to Principle, Mechanism, and Function</p> <p>a) Thermograph</p> <p>b) Barograph</p> <p>c) Dry and Wet Bulb Thermometer</p> <p>d) Cup Anemometer</p> <p>e) Rain Gauge</p> <p>5.2 Isobaric Patterns: Cyclone, Anticyclone, Col, Ridge, Secondary Depression.</p> <p>5.3 Sign and Symbols used in Indian Daily Weather Maps.</p> <p>5.4 Interpretation of Indian Daily Weather Maps (Rainy, Winter and Summer)</p> <p>Marginal Information, Pressure, Winds, Clouds, Rainfall, Other Conditions, Sea Condition, Temperature departure from normal.</p>	15
Unit 6	<p>Representation Techniques of Statistical Data</p> <p>6.1 Graphs and Diagrams</p> <p>6.1.1 Diagrammatic Representation:</p> <p>i) Line Graph (Simple, Multiple and Band Graph)</p> <p>ii) Bar Graph (Simple, Multiple and Compound)</p> <p>iii) Pie Diagram</p> <p>6.2 Thematic Mapping Techniques:</p> <p>i) Proportional Circle</p> <p>ii) Choropleth Map</p> <p>iii) Dot Map</p> <p>iv) Isopleths</p> <p>6.3 Cartographic Overlays:</p> <p>i) Point</p>	15

	ii) Line iii) Areal Data	
Unit 7	Journal and Viva Voce	10

References:-

1. Bygoot, J: An Introduction to Mapwork and Practical Geography, University Tutorial,
London 1964.
2. Khan MD. Zulfequar Ahmad : Text Book of Practical Geography, Concept Publishing Company, New Delhi, 1998
3. Mishra, R.P. and Ramesh A. : Fundamentals of Cartography, Concept Publishing Company, New Delhi, 2000
4. Monkhouse F.J. and Wilkison, H.R.: Maps and Diagrams, Mathuen. London, 1971.
5. Negi. , Dr. Balbir Singh : Practical Geography, Kedar Nath Ram Nath, Meerut, Delhi.
6. Raisz, E.: Principals of Cartography, McGraw Hill Book Com., Inc, New York, 1962.
7. Robinson, A.H. and Sale, S.D.: Elements of Cartography, John Witey and Sons, Inc, New York, 1969.
8. Saha, Pijushkanti and Basu Partha : Advanced Practical Geography - A Laboratory Manual Books and Allied (P) Ltd, Kolkata. 2010.
9. Sarkar, Ashis : Practical Geography: A systematic Approach, Orient Longman limited, Calcutta, 1997.
10. Singh, Gopal : Map work and Practical Geography Vikas Publishing House Pvt. Ltd. New Delhi, 1996.
11. Singh, R and Kanaujia, L.R.S.: Map Work and Practical Geography, Central Book Depot, Allahabad.

13. Singh, R. L. and Rana P.B. : Elements of Practical Geography, Kalyani Publishers, New Delhi – Ludhiana, 1998.
14. Aher A. B., Chodhari A. P. & Bharambe S. N. Techniques of Spatial Analysis Prashant Publication Jalgaon 2015
15. Maurice Yeats, An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York, 1974.
16. P. Saha and P. Basu (2006): Advanced Practical Geography, Books and Allied Publication, Kolkata, India.
17. Khullar, Essentials of Practical Geography, New Academic Publishing Co, India.
18. Singh L R (2011): Fundamentals of Practical Geography
19. Robinson Rep. (2010): Elements of Cartography 6/e
20. Khan Za (1998): Text Book of Practical Geography

B. A. Part - III CBCS
Semester - VI Paper- XIV
Advanced Tools, Techniques and Field Work
(Practical Paper 2)

1. Course Outcomes

- CO1** Understand and apply computer applications, Remote sensing, GIS Techniques
CO2 Analyse statistical methods, techniques
CO3 Use various surveying techniques
CO4 will be able to do project work based on field work

Unit	Advanced Tools, Techniques and Field Work	Marks
Unit 1	<p>Introduction to Computer</p> <p>1.1: Computer Fundamentals: Definition, Structure, Characteristics, Hardware & Software.</p> <p>1.2: Application of computer in geography</p> <p>1.2.1: Construction of Line Graphs, Bar Graphs</p> <p>1.2.2: Construction of Pie Diagram and Scatter Diagram.</p> <p>1.3: Significance and application of Internet in Geographical Studies.</p>	10
Unit 2	<p>Remote Sensing</p> <p>2.1 Definitions of Remote Sensing.</p> <p>2.2 Fundamentals of Remote Sensing: EMR, Sensors and Platforms.</p> <p>2.3 Application of Remote Sensing in Geography.</p> <p>2.4 Aerial photographs and Satellite imagery: Definition, types and difference between them.</p> <p>2.5 Elements of Image Interpretation</p> <p>2.6 Determination of Photo Scale.</p> <p>2.7 Identification of Physical and cultural features from Aerial Photographs or Satellite Imagery.</p>	15
Unit 3	<p>GIS and GNSS</p> <p>3.1 Geographical Information System (GIS)</p> <p>3.1.1 Definition and components</p> <p>3.1.2 GIS Data Structure: Types (spatial and non-spatial), Raster and Vector data</p> <p>3.1.3 Georeferencing, Digitization, Map Layout Preparation</p> <p>3.1.4 Application of GIS in Geography: Land use or Land Cover, Urban Sprawl Analysis, Forests Monitoring</p>	15

	<p>3.2 Global Navigation Satellite System (Global Positioning System)</p> <p>3.2.1 Definition and components</p> <p>3.2.2: Application of GPS in Geography</p> <p>3.2.3 Field work in GPS: Determining latitude, longitude and altitude</p> <p>3.3: Exercise with Google earth Program.</p>	
Unit 4	<p>Statistical methods and techniques</p> <p>4.1: Geographical Data:</p> <p>4.1.1 Spatial and Temporal Data</p> <p>4.1.2 Individual, Discrete and Continuous Data</p> <p>4.2 Analysis of statistical data by the following methods and techniques</p> <p>4.1.1: Measures of Central Tendency: Mean, Median and Mode</p> <p>4.1.2: Dispersion: Mean deviation, Standard deviation.</p> <p>4.1.3: Association and Correlation: Simple Regression, Rank Correlation, and Karl Pearson's Method (Product Moment)</p> <p>4.1.4: Analysis of Time Series: Semi-average Method and Moving average method</p>	15
Unit 5	<p>Surveying</p> <p>5.1 Introduction to Survey: Meaning and types</p> <p>5.2 Preparation of plans of the given area with the following survey method (Any one methods among them)</p> <p>A Plane Table survey (Radial, Intersection, and Traverse method)</p> <p>B Theodolite survey</p> <p>C Dumpy Level survey</p> <p>D Total Station</p> <p>E Ebony Level Survey.</p> <p>5.3 Preparation of plans Prismatic compass survey (Radical, Intersection and Traverse method)</p> <p>5.3.1 Types and conversion of bearings.</p> <p>5.3.2 Correction of bearing.</p>	15
Unit 6	<p>Project work based on field work (any one)</p> <p>Resource survey, Population survey, Agricultural survey, Settlement Survey, Environmental issues, Industrial survey, Health survey, Natural hazard or disaster survey etc.</p>	15

Unit 7	Study Tour Maximum 15 days of study tour and preparation of tour report.	10
Unit 8	Journal and Viva Voca	10

Reference:

1. Lo C. P., Albert K. W. Yeung, (2011): Concepts and Techniques of Geographic Information Systems, PHI Learning Private Limited, New Delhi-110001.
2. Bygoot, J: An Introduction to Mapwork and Practical Geography, University Tutorial,
London 1964.
3. Khan MD. Zulfequar Ahmad : Text Book of Practical Geography, Concept Publishing Company, New Delhi, 1998
4. Mishra, R.P. and Ramesh A. : Fundamentals of Cartography, Concept Publishing Company, New Delhi, 2000
5. Monkhouse F.J. and Wilkison, H.R.: Maps and Diagrams, Mathuen. London, 1971.
6. Negi. , Dr. Balbir Singh : Practical Geography, Kedar Nath Ram Nath, Meerut, Delhi.
7. Raisz, E.: Principals of Cartography, McGraw Hill Book Com., Inc, New York, 1962.
8. Robinson, A.H. and Sale, S.D.: Elements of Cartography, John Witey and Sons, Inc, New York, 1969.
9. Saha, Pijushkanti and Basu Partha : Advanced Practical Geography - A Laboratory Manual Books and Allied (P) Ltd, Kolkata. 2010.
10. Sarkar, Ashis : Practical Geography: A systematic Approach, Orient Longman limited, Calcutta, 1997.
11. Singh, Gopal : Map work and Practical Geography Vikas Publishing House Pvt. Ltd. New Delhi, 1996.

13. Singh, R and Kanaujia, L.R.S.: Map Work and Practical Geography, Central Book Depot, Allahabad.
14. Singh, R. L. and Rana P.B. : Elements of Practical Geography, Kalyani Publishers, New Delhi - Ludhiana, 1998.
15. Aher A. B., Chodhari A. P. & Bharambe S. N. Techniques of Spatial Analysis Prashant Publication Jalgaon 2015
16. Maurice Yeats, An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York, 1974.
17. P. Saha and P. Basu (2006): Advanced Practical Geography, Books and Allied Publication, Kolkata, India.

Structure of Course for B.A.III. Evolution of Geographical Thought:-

Sr. No.	Sem ester	Title of the Paper	Discipli ne	Credi t	Workloa d Per Week	Total Credits	Marks	
							Theor y	Term Work
1	V	Evolution of Geographical Thought	Arts	04	04	04	40	10
2	V	Geography of India	Arts	04	04	04	40	10
3	V	Population Geography ¹	Arts	04	04	04	40	10
	V	Social Geography ²	Arts	04	04	04	40	10
4	VI	Economic Geography	Arts	04	04	04	40	10
5	VI	1. Urban Geography or 2. Regional Planning & Sustainable Development	Arts	04	04	04	40	10
6	VI	Political Geography ¹ Or Geography Of Health & Well Being ²	Arts	04	04	04	40	10

Nature of Question Paper:-

Q.N.	Nature of Question Paper	Total Marks : - 40
Q.1	A) Multiple choice questions.	05
	B) Answer in one or two sentences.	05
Q.2	A) Long answer type question. or B) Long answer type question.	10
Q.3	A) Long answer type question. or B) Long answer type question	10
Q.4	Short Note (any 2 out of 4)	10

"Dissemination of Education for Knowledge, Science and Culture"
- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)**



DEPARTMENT OF ECONOMICS

**B. A. Part - III
Semester-V & VI**

SYLLABUS

**Under Choice Based Credit System
Syllabus with effect from the Academic Year 2020-21**

Course Structure

Paper No	Course Code	Title of the Course	Credits	Theory Marks	Internal Marks	Total Marks
Semester V						
VII	DSE 1018E1	Micro Economics	4	40	10	50
VIII	DSE 1018E2	Research Methodology-I	4	40	10	50
IX	DSE 1018E3	History of Economic Thoughts	4	40	10	50
X	DSE 1018E4	Economics of Development	4	40	10	50
XI	DSE 1018E5	International Economics	4	40	10	50
SEC	SEC -AE	Consumer Rights and Protection	2			
Semester VI						
XII	DSE 1018F1	Market and Pricing	4	40	10	50
XIII	DSE 1018F2	Research Methodology-II	4	40	10	50
XIV	DSE 1018F3	Economic Thoughts of Chh. Shahu Maharaj	4	40	10	50
XV	DSE 1018F4	Economics of Planning	4	40	10	50
XVI	DSE 1018F5	GST in India	4	40	10	50

SEC	SEC- AF	Data Analysis with Excel	2			
-----	---------	-----------------------------	---	--	--	--

**B.A. Part - III CBCS
Semester-V Paper -VII
Micro Economics (DSE 1018E1)**

Course Outcomes: On completion of this course it is expected that the student will be able to:

CO1. Differentiate micro and macro economic factors

CO2. Consumer's behavior and equilibrium

CO3. Analyze demand and supply

CO4. Understand theory of production and importance of cost revenue concepts.

Modules	Content	Teaching Hours	Credit
Module I	Introduction to Micro Economics Meaning, nature and scope Importance and limitations The Economic Problem- Scarcity and Choice Concept of opportunity cost	15	1
Module II	Consumer's Behavior Utility- concept, total and marginal utility Cardinal utility approach: law of diminishing marginal utility Ordinal utility approach: meaning and properties of indifference curve Consumer's equilibrium and consumer's surplus	15	1
Module III	Demand and Supply Analysis Demand function, Law of demand, Elasticity of demand: price, income and cross Importance of Elasticity of Demand Law of supply, supply function and elasticity	15	1

ModuleIV	Theory of Production Law of variable proportions Law of returns to scale Revenue- total, marginal and average revenue Cost concepts and their relationship, cost curves-short run and long run	15	1
-----------------	---	-----------	----------

Reference Books:

1. Dominic Salvator (2012) – Principles of Micro Economics, 5 th edition, Oxford University Press, Oxford.
2. John B. Taylor & Akila Weerapana, (2011) ‘Principles of Economics’, 7th Edition, Cengage Learning, India, New Delhi.
3. Koutsoyiannis, A. (1979), Modern Microeconomics, 2nd Edition, Macmillan Press, London.
4. Lipsey Richard G., (latest edition), An Introduction to Positive Economics, Weidenfeld & Nicolson, London.
5. Lipsey, R.G. and K.A. Chrystal (latest edition), Principles of Economics (IX Ed.), Oxford University Press, Oxford.
6. Mankiw, N. Gregory (2008), Principles of Microeconomics, 5th Edition, Cengage Learning India, New Delhi.
7. Mansfield, E (latest edition), Microeconomics (9th Ed) W.W. Norton and Company, New York.
8. Pindyek and Rubinfeld (latest edition)- Micro Economics, Pearson Education, New Delhi.
9. Ray, N.C. (latest edition), An introduction to Microeconomics, Macmillan company of India Ltd.
10. Samuelson, P.A. and W.D. Nordaus (latest edition), Economics, Tata McGraw Hill, New Delhi.
11. Stonier, A.W. and D.C. Hague (latest edition), A Textbook of Economic Theory, ELBS and Logman Group, London.
12. Varian, Hall (1992): Microeconomic Analysis, Third Edition, W. W. Norton & Company, Inc, New York.

B.A. Part - III CBCS
Semester-VI Paper -XII
Market and Pricing (DSE 1018F1)

Course Outcomes: completion of this course it is expected that the student will be able to:

- CO1: Understand the causes and consequences of different market structures
 CO2: Apply micro economic analysis to the firm under different market conditions
 CO3: Understand basic theories behind factor pricing
 CO4: Understand pricing strategies

Modules	Content	Teaching Hours	Credit
Module I	Perfect Competition Meaning and characteristics price and output determination under perfect Competition Equilibrium of the firm and industry in the short run Equilibrium of the firm and industry in the long run	15	1
Module II	Monopoly Meaning and characteristics Price discrimination and degrees Equilibrium of a monopoly firm in the short run and long run Excess capacity	15	1
Module III	Imperfect Competition Meaning and characteristics of Monopolistic competition Price- output determination Oligopoly - meaning and characteristics Duopoly- meaning and characteristics	15	1
Module IV	Factor Pricing Marginal productivity theory Modern theory of rent Keynesian theory of interest Risk and uncertainty theory of profit	15	1

Reference Books:

1. Dominic Salvator (2012) - Principles of Micro Economics, 5 th edition, Oxford University Press, Oxford.
2. John B. Taylor & Akila Weerapana, (2011) 'Principles of Economics', 7th Edition, Cengage Learning, India, New Delhi.
3. Koutsoyiannis, A. (1979), Modern Microeconomics, 2nd Edition, Macmillan Press, London.
4. Lipsey Richard G., (latest edition), An Introduction to Positive Economics, Weidenfeld & Nicolson, London.
5. Lipsey, R.G. and K.A. Chrystal (latest edition), Principles of Economics (IX Ed.), Oxford University Press, Oxford.
6. Mankiw, N. Gregory (2008),Principles of Microeconomics, 5th Edition, Cengage Learning India, New Delhi.
7. Mansfield, E (latest edition), Microeconomics (9th Ed) W.W. Norton and Company,New York.
8. Pindyek and Rubinfeld (latest edition)- Micro Economics, Pearson Education, NewDelhi.
9. Ray, N.C. (latest edition), An introduction to Microeconomics, Macmillan company of India Ltd.
- 10.Samuelson, P.A. and W.D. Nordaus (latest edition), Economics, Tata McGraw Hill,New Delhi.
- 11.Stonier, A.W. and D.C. Hague (latest edition), A Textbook of Economic Theory, ELBSand Logman Group, London.
12. Varian, Hall (1992): Microeconomic Analysis, Third Edition, W. W. Norton & Company, Inc, New York.

B.A. Part - III CBCS
Semester-V Paper -VIII
Research Methodology-I (DSE 1018E2)

Course Outcomes: On completion of this course it is expected that the student will be able to:

- CO1. Types of research with their objectives
- CO2. Need and importance of literature review
- CO3. Understand idea of hypothesis and its design
- CO4. Use appropriate data collection method in research

Module	Content	Teaching Hours	Credit
Module I	Introduction to research in economics Meaning, definitions and objectives of research Types of research Significance of research Areas of economic research	(15)	1
Module II	Literature review and research design Literature review- meaning, need, how to carryout a literature review? Research design- steps in research design Features of good research design Importance of research design	(15)	1
Module III	Hypothesis Meaning and definition, kinds of hypothesis Features of hypothesis Importance of hypothesis	(15)	1
Module IV	Data collection Primary and secondary data Primary data collection methods- observation,questionnaire, interview Sources of secondary data Importance of data collection	(15)	1

Reference Books:

1. Goode and Hatt (1981), Methods in Social Research, McGraw Hill International Book Company, New Delhi.
2. Kerlinger F.N. (1983), Foundation of Behavioural Research, Surjeet ublication,Delhi.
3. Young P. V. (1960), Scientific Social Survey and Research, Asia Publication House,Mumbai.
4. Kothari C.R. (1993), Research Methodology-Methods and Techniques, Wiley

Eastern Ltd.,New Delhi.

5. Lundbrg G.A. (1960), Social Research, Longmans Green and Company, New York.

6. Herekar P .M. (2019), Research Methodology and Project Work, Phadake Prakashan,Kolhapur.

7. Settiz Claire, Jahoda Marie and Others (1959), Research Methods in Social Research,Dryden New York.

8. Takur Dvendra (1997), Research Methodology in Social Sciences, Deep and Deep Publication,New Delhi.

9. Gupta S.P.and Gupta M.P. (2005), Business Statistics, Sultan Chand & Sons, New Delhi

10. Gupta C.B. (1996), An Introduction to Methods, Vikas Publication House,New Delhi.

B.A. Part - III CBCS
Semester-VI Paper -XIII
Research Methodology-II (DSE 1018F2)

Course Outcomes: On completion of of this course it is expected that the student will be able to:

- CO1. Find out optimum size of sampling
- CO2. Process and represent data
- CO3. Analyze data by using simple statistical tools.
- CO4. Understand steps of report writing.

Module	Content	Teaching Hours	Credit
Module I	Sampling Meaning and nature Types of sampling Criteria of good sampling Optimum size of sampling	15	1
Module II	Processing and representation of data Classification of data Tabulation of data Percentage, Graphs and diagrams Need and importance of data analysis	15	1
Module III	Techniques of data analysis Measures of central tendency: mean, mode, median (direct method) Measures of variation: range, standard deviation Coefficient of Variation and Its Interpretation Correlation- meaning and importance, Karl Pearson's coefficient of correlation	15	1
Module IV	Interpretation of data and report writing 4.1 Interpretation of data: meaning Report writing: meaning & steps Properties of good report writing 4.4 Writing a good research proposal	15	1

Reference Books:

1. Goode and Hatt (1981), *Methods in Social Research*, McGraw Hill International Book Company, New Delhi.
2. Kerlinger F.N. (1983), *Foundation of Behavioural Research*, Surjeet Publication, Delhi.
3. Young P. V. (1960), *Scientific Social Survey and Research*, Asia Publication House, Mumbai.
4. Kothari C.R. (1993), *Research Methodology-Methods and Techniques*, Wiley Eastern Ltd., New Delhi.
5. Lundberg G.A. (1960), *Social Research*, Longmans Green and Company, New York.
6. Herekar P .M. (2019), *Research Methodology and Project Work*, Phadake Prakashan, Kolhapur.
7. Settiz Claire, Jahoda Marie and Others (1959), *Research Methods in Social Research*, Dryden New York.
8. Takur Dvendra (1997), *Research Methodology in Social Sciences*, Deep and Deep Publication, New Delhi.
9. Gupta S.P. and Gupta M.P. (2005), *Business Statistics*, Sultan Chand & Sons, New Delhi

B.A. Part - III CBCS
Semester-V Paper -IX
History of Economic Thoughts (DSE 1018E3)

Course Outcomes:

On completion of this course it is expected that the student will be able to:

CO1: Understand the basic economic ideas of various economic thinkers of the world

CO2: Explain the relationship between stage of economic development and the economic consideration.

CO3: Differentiate classical and neo-classical thoughts

CO4: Understand value concept in theory

Module	Content	Duration (In hours)	Credit
Module I	Origin of Economic Early economic thought, rise of mercantilism features of Mercantilism Meaning and causes of emergence of Physiocracy The concept of natural order and primacy of agriculture	(15)	1
Module II	Classical Economic Thoughts Adam Smith: Division of labour, theory of value David Ricardo: Theory of Value and views on distribution Thomas Malthus: Theory of Population Theory of Gluts	(15)	1
Module III	Economic Thoughts of Fredrick List & Karl Marks Stages of Economic growth Concept of Nationalism and Protectionism The Concept of Scientific Socialism and Materialist approach Theory of Surplus Value	(15)	1
Module IV	Neo- Classical Economic Thought - Alfred Marshall Theory of Value The concept of representative firm Consumer's surplus Quasi rent	(15)	1

Reference Books:

1. Dandekar V.M.and N.Nath (1971), Poverty in India, Indian school of political Economy, Pune.
2. Ganguli B. N. (1977): Indian Economic Thought - A 19th Century Perspectives, Tata Mc Grow Hill, New Delhi.
3. Rath Nilkanth(1995) V.M.Dandekar Social Scientist with a Difference : Journal of Indian School of Political Economy.Oct-Dec.1995, Vol-7 No-4.
4. Seshadri G.B.(1997): Economic Doctrines, Publishing Corporation, New Delhi.
5. चा.भ.खैरमोडे (१९७८) - डॉ.भीमराव रामजी आंबेडकर, खंड १ ला , खंड २ रा खंड ७वा, प्रताप प्रकाशन.
6. गांधी मो.क.(१९९७) -मराठी अनुवाद सीताराम पुरोषोत्तम पटवधधन'सत्याचे प्रयोगअथवा आत्मकथा पाचवी आवृत्ती.

B. A. Part III CBCS
Semester-V Paper -X
Economics of Development (DSE 1018E4)

Course Outcomes: By the end of this course it is expected that the student will be able to:

- CO1. Make difference between economic growth and development
- CO2. Analyze stages of economic development
- CO3. Understand need and importance of sustainable development
- CO4. Evaluate role of government and economic development

Module	Content	Duration (In hours)	Credit
Module I	Basic concepts of economic development Meaning of economic development- Distinction between economic development and growth Indicators of economic development Obstacles to economic development Sustainable and green development	(15)	1
Module II	Theories of economic development 2.1 Classical approach to development- Ricardian Theory 2.2 Myrdal's theory of economic development Rostow's stages of economic growth Theory of balanced and unbalanced growth	(15)	1
Module III	Resources for economic development Capital formation, Technology and economic development Human capital and economic development Role of state in economic development Development status of Indian Economy	(15)	1
Module IV	Environment and development Growth and environmental degradation Loss of biodiversity Greenhouse gases and ozone depletion Green climate fund -GCF	(15)	1

Reference books:

1. Adelman, Irma (1962), Theories of Economic Growth and Development, Stanford University Press, Stanford.
2. Behrman, S. and T.N. Srinivasan (1995), Handbook of Development Economics, Vol. 1 to 3, Elsevier, Amsterdam. Economics 31
3. Ghatak, Subrata (1986), Introduction to Development Economics, Allen and Unwin, London.
4. Hayami, Yujiro and Yoshihisa Godo (1997), Development Economics, Oxford University Press, New York.
5. Higgins, Benjamin (1980), Economic Development, Norton, New York.
6. Kindleberger, C.P. (1965), Economic Development, 3e, McGraw Hill, New York.
7. Meier, Gerald M. and James E. Rauch (2005), Leading Issues in Economic Development, Oxford University Press, New Delhi.
8. Myint, Hla (1965), The Economics of Underdeveloped Countries, Preager, New York.
9. Myint, Hla (1971), Economic Theory and Under Developed Countries, Oxford University Press, New York.
10. Thirlwall, A.P. (1999), (6th Edition), Growth and Development, Macmillan, London.
11. Bhagwati, J. and P. Desai (1970), India : Planning for Industrialization, Oxford University Press, London.
12. Boserup, Ester (1981), Population and Technological Change : A Study of Long Term Change, Chicago University Press, Chicago.
13. Brahmananda, P.R. and C.N. Vakil (1956), Planning for an Expanding Economy, Vora and Co., Bombay.
14. Puri V. K. And S. K. Misra (2016), Economics of Development and Planning, Himalaya Publishing House.
15. Datta Gaurav and Ashwini Mahajan (2016), Indian Economy, S. Chand Publishing, New Delhi
16. Todaro Michael P. And Stephen C. Smith (2017), Economic Development, Pearson Education.
17. Chakravarti, Sukhamoy (1982), Alternative Approaches to the Theory of Economic Growth, Oxford University Press, Delhi.
18. Chakravarty, Sukhamoy (1987), Development Planning : The Indian Experience, Clarendon Press, Oxford.
19. Jhingan, M.L. (2005) The Economics of Development and Planning , Vrinda Publications Ltd. Delhi
20. Lekhi, R.K. (2005) Economics of Development and Planning, Kalyani Publishers, Delhi.
21. Patil, J. F. (et al) (2005) Economics of Growth and Development (Marathi) , Phadake Publishers, Kolhapur.
22. Patil, J.F. & Tamhankar, P.J. (1990) Economics of Development and Planning (Marathi), Continental Publishers, Pune.
23. Kavimandan (1975), Economics of Development and Planning (Marathi), Mangesh Prakashan , Nagpur

B.A. Part - III CBCS
Semester-VI Paper -XV
Economics of Planning (DSE 1018F4)

Course Outcomes:

By the end of this course it is expected that the student will be able to:

- CO1. Understand types and conditions of planning
- CO2. Understand issues of economic planning
- CO3. Examine planning strategy of India
- CO4. Analyze sector wise development through planning in India.

Module	Content	Duration(In hours)	Credit
Module I	Introduction to economic planning Meaning, Case for and against economic planning Genesis of planning Types of planning Conditions of success of planning	(15)	1
Module II	Issues in economic planning 2.1 The choice of techniques: labour and capital intensive 2.2 Capital output ratio: Importance and factors affecting COR Input output analysis –Liaontif Model Project evaluation	(15)	1
Module III	Planning in India- I Evolution of planning in India Planning Commission National Development Council NITI Ayog- Need for establishment, organization, objectives and work	(15)	1
Module IV	Planning in India- II Agricultural development under plans Industrial development under plans Services sector development under plans Inclusive Growth	(15)	1

Reference books:

1. Behrman, S. and T.N. Srinivasan (1995), Handbook of Development Economics, Vol. 1 to 3, Elsevire, Amsterdam. Economics 31
2. Hayami, Yujiro and Yoshihisa Godo (1997), Development Economics, Oxford University Press, New York.
3. Kindleberger, C.P. (1965), Economic Development, 3e, McGraw Hill, New York.

4. Meier, Gerald M. and James E. Rauch (2005), *Leading Issues in Economic Development*, 6e, Oxford University Press, New Delhi.
5. Myint, Hla (1971), *Economic Theory and Under Developed Countries*, Oxford University Press, New York.
6. Thirlwal, A.P. (1999), (6th Edition), *Growth and Development*, Macmillan, London.
7. Bhagwati, J. and P. Desai (1970), *India : Planning for Industrialization*, Oxford University Press, London.
8. Brahmananda, P.R. and C.N. Vakil (1956), *Planning for an Expanding Economy*, Vora and Co., Bombay.
9. Puri V. K. And S. K. Misra (2016), *Economics of Development and Planning*, Himalaya Publishing House.
10. Datta Gaurav and Ashwini Mahajan (2016), *Indian Economy*, S. Chand Publishing, New Delhi
11. Chakravarty, Sukhamoy (1987), *Development Planning : The Indian Experience*, Clarendon Press, Oxford.
12. Jhingan, M.L. (2005) *The Economics of Development and Planning* , Vrinda Publications Ltd. Delhi
13. Lekhi, R.K. (2005) *Economics of Development and Planning*, Kalyani Publishers, Delhi.
14. Patil, J. F. (et al) (2005) *Economics of Growth and Development (Marathi)* , Phadake Publishers, Kolhapur.
15. Patil, J.F. & Tamhankar, P.J. (1990) *Economics of Development and Planning (Marathi)*, Continental Publishers, Pune.

B.A. Part - III CBCS
Semester-V Paper -XI
International Economics (DSE1018E5)

Course Outcomes:

By the end of this course it is expected that the student will be able to:

- CO1. Analyze international trade through theoretical background
- CO2. Understand issues related to international trade
- CO3. Know the role and importance of international institutions.
- CO4 Understand significance of exchange rate

Module	Content	Duration (In hours)	Credit
Module I	Trade and Trade Theories Importance of the study of International Economics Inter-regional and international trade: similarities and dissimilarities. Ricardian theory of international trade Heckscher - Ohlin Theory	(15)	1
Module II	Exchange Rate Meaning of exchange rate, Purchasing Power Parity theory Fixed Exchange Rate - meaning, merits and demerits Flexible Exchange Rate - meaning, merits and demerits Floating Exchange Rate - meaning, merits and demerits	(15)	1
Module III	Balance of Trade and Balance of Payments Balance of Trade and Balance of Payments Importance of Balance of Payments Disequilibrium in Balance of Payments: Causes and Consequences Measures to correct disequilibrium in Balance of Payments	(15)	1

Module IV	International Institutions IMF: Objectives and Functions IBRD: Objectives, Functions WTO: Objectives, Functions BRICS : Objectives, Functions	(15)	1
------------------	--	-------------	----------

Reference books:

- 1 Aggarwal, M. R. (1979), *Regional Economic Cooperation in South Asia*, S. Chand and Co., New Delhi.
- 2 Bhagwati, J. (Ed.) (1981), *International Trade, Selected Readings*, Cambridge University Press, Mass.
- 3 Crockett. A. (1982), *International Money: Issue and Analysis*, ELBS and Nelson, London.
- 4 Greenaway. D. (1983), *International Trade Policy*, MacMillan Publishers Ltd., London.
- 5 Heller, H. R. (1968), *International Monetary Economics*, Prentice Hall. India.
- 6 Joshi V. and I.M.D. Little (1998), *India's Economic Reforms, 1999-2001*, Oxford
- 7 Kenan, P.B. (1994), *The International Economy*, Cambridge University Press, London.
- 8 Kindlberger, C. P. (1973), *International Economics*, R.D. Irwin, Homewood.
- 9 Krugman, P. R. and M. Obstgeld (1994), *International Economics: Theory and Policy*, Glenview, Foresman.
- 10 Mithani D.M. (Reprint-2009) *International Economics*, Himalaya Publishing House, New Delhi.
- 11 Nayyar, D. (1976) : *India's Exports and Export Policies in the 1960s*, Cambridge University Press, Cambridge.
- 12 Panchmukhi, V. R. (1978), *Trade Policies of India: A Quantitative Analysis*, Concept University Press, Delhi.
- 13 Patel, S. J. (1995), *Indian Economy Towards the 21st Century*, University Press Ltd., India.
- 14 RuddarDatt & K.P.M. Sundaram, (2018), *Indian Economy*, S. Chand & Co. Ltd., New Delhi
- 15 Salvatore, D. L. (1997), *International Economics*, Prentice- Hall, Upper Saddle River, N. J.
- 16 Singh, M. (1964), *India Export Trends and the Prospects for Self-sustained Growth*, Oxford University Press, Oxford.
- 16 Sodersten, Bo (1991), *International Economics*, MacMillan Press Ltd. London

B.A. Part - III CBCS
Semester-V Paper -XVI
GST in India (DSE 1018F5)

Course Outcomes: By the end of this course, it is expected that the student will be able to:

CO1: Understand need scope and significance of GST.

CO2: Know the different components of GST.

CO3: Understand basic of GST like registration and returns.

CO4: Understand significance of GST in Indian economy

Module	Content	Duration (In hours)	Credit
Module I	Taxation In India Issues with pre GST structure Constitutional Amendment of GST Scope of GST Significance of GST	(15)	1
Module II	Components of GST CGST, SGST & UTGST IGST GSTN - HSN Code - SAC code GST council - Structure, Power and Functions.	(15)	1
Module III	Levy, Exemptions and Collections from Tax Levy and Collection of Tax Rates of GST Composition Levy Taxable person	(15)	1
Module IV	Registration, Returns and Accounts and Assessment Registration certificate Tax Invoice 4.3 Filing Returns 4.4 Assessment under GST-Types	(15)	1

Reference Books:

- 1)Singhania, V.K. : Students' Guide to Income Tax, Taxmann Publication, New Delhi
- 2)Manoharan, T.N. : Direct Taxes : Snow White Publications, New Delhi
- 3)Singhania, Monica : Students' Guide to Income Tax and GST, Taxmann, New Delhi
- 4)Sury, M.M. : Goods and Services Tax in India,
- 5) Agarwal, CA VK : GST Guide for Students, Neelam Book House, Delhi
- 6) Datey, V.S. : GST Ready Reckoner, Taxmann, New Delhi
- 7)Thakkar, Vishal : GST for the Layman, TV18Broadcast Ltd.,
- 8) The Institute of Chartered Accountants of India, Study Material for CA Inter/Final-Taxation

B.A. Part - III CBCS
Semester-V SEC
Consumer Rights and Protection
(SEC AE)

Course outcomes: By the end of this course it is expected that the student will be able to:

CO1. Understand the role and relevance of consumer rights.

CO2. Know the different rights under consumer Act.

CO3. Understand use of NCH app.

CO4. Understand role of consumer forum

Module	Content	Credit
Module I	Consumer Issues Consumer Education Consumer Rights Consumers responsibilities	1
Module II	Consumer Protection Act Importance of Consumers protection Consumer Forum NCH app	1

Reference Books :

1. Mohammed Kamalun Nabi (2015), Consumer Rights and Protection in India, New Century Publications
2. Dr. V.K. Agarwal (2021), Law of Consumer Protection (4th Ed.), Bharat's Publication
3. Shyam Padman (2022), The Law of Consumer Protection (4th Ed., Lexis Nexies

B.A. Part - III CBCS
Semester-V SEC
Data Analysis with Excel (SEC AF)

Course Objective:

By the end of this course it is expected that the student will be able to:

CO1 : Understand MS Excel

CO2 : Know various tools of excel sheet

CO3 : Analyze data by using spread sheet

CO4 : Apply statistical tool in spread sheet

Module	Content	Credit
Module I	MS Excel Spared sheet-Creating, editing, saving andprinting spreadsheets Data feeding Freeze panes Tools of insert menu	1
Module II	Data Analysis Data filtration Percentage Central Tendency-Mean, Median, Mode Measures Dispersion- Range, S.D., C.V	1

Reference Books :

1. Stephen L. Nelson, E. C. Nelson (2018), Microsoft Excel Data Analysis For Dummies (3Ed), Wiley India
2. Manisha Nigam (2019), Data Analysis with Excel, Worldwide
3. Hector Guerrero (2019), Excel Data Analysis, Springer
4. Arora, Hitesh (2009), Data Analysis Using Microsoft Excel, Abhigyan; New Delhi

Evaluation Pattern

Written Examination			Total Marks	
Total Marks = 40 Time=2.00 hours * All Questions are compulsory (Based on all Modules)				
Q. No	Nature of Question	Marks	40 Marks	
Q.1	A. Multiple Choice Questions B. Answer in one sentence or Match the pair	05 Marks 05 Marks		
Q.2	A. Broad Answer Question Or B. Broad Answer Question	10 Marks		
Q.3	A. Broad Answer Question Or B. Broad Answer Question	10 Marks		
Q.4	Short notes (Any 2 out of 3)	10 Marks		
Total Marks		40 Marks		
Internal Evaluation		10 Marks		10 Marks
* Semester 3 rd : Seminar				
** Semester 4 th : Project work				
Grand Total				50 Marks

"Dissemination of Education for Knowledge, Science and Culture"

- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF HISTORY

**B.A. Part - III
Semester-V & VI**


SYLLABUS

Under Choice Based Credit System

To be implemented from

Academic Year 2020-21




HEAD
DEPARTMENT OF HISTORY
VIVEKANAND COLLEGE, KOLHAPUR
(AUTONOMOUS)

Vivekanand College, Kolhapur (Autonomous)

Syllabus for B.A. III. History (Hons) w.e.f. June 2020

Sem. V. Paper No. VII

History of Mughal India (1526-1707) -I

B.A.III- DSC-1020 E-1

COs	On completion of the course, students will be able:
CO: I	To understand important historical sources of history of Mughal Empire.
CO: II	To get acquainted with silent features of Mughal Polity, Society and Economy.
CO: III	To examine and evaluate the Mughal society.
CO: IV	To criticize trade and commerce during Mughal Polity.

Module No.	Name of Unit	Teaching Hours	Credits
1.	Sources a) Literary: Sources in Farsi , Marathi, and Sanskrit languages. b) Archaeological sources c) Foreign travellers' account: Factory Records & Fransis Bernier d) Mughal Court Writers :-Abul Fajal & Abdul Kadir Badayuni	15	1
2.	Mughal Polity a) Mughal Administrative system b) Mansab & Jagir c) Religious policy of Akbar & Aurangzeb	15	1
3.	Rural Economy & Society a) Agricultural Production, Techniques & Crop Patterns, irrigation b) Land Revenue System c) The Village community	15	1
4.	Trade & Commerce a) Trade routes & Internal trade, Mode of Transports b) Indian ocean trade network in 17 th century	15	1
	Total	60	4

Vivekanand College , Kolhapur (Autonomous)
Syllabus for B.A. III. History (Hons) w.e.f. June 2020
Sem. VI. Paper No. XII
History of Mughal India (1526-1707 A.D.) -II

B.A.III- DSC-1020 F-1

COs	On completion of the course, students will be able:
CO: I	To get acquainted with silent features of cultural developments of Mughal era.
CO: II	To criticize the urban centres of during Mughal era.
CO: III	To critically evaluate the Mughal Maratha relations.
CO: IV	To determine various aspects of Bhakti Movement in Medieval India.

Module No.	Name of Unit	Teaching Hours	Credits
1.	<u>Urban Centres</u> a) Urban economy, crafts industries, Imperial Karkhanas & Textile b) Urban social structure, merchant communities, craftsman and labour	15	1
2.	<u>Cultural Developments</u> a) Visual: Paintings, Sculpture b) Performing Art: Music, Dance, Vocal c) Mughal Architecture	15	1
3.	<u>Mughal Maratha Relation</u> a) Chh. Shivaji Maharaj b) Chh. Sambhaji Maharaj c) Chh. Rajaram Maharaj d) Chh. Tarabai	15	1
4.	<u>Religion & Culture</u> a) Sufis b) Saint Tradition, Vaishnavism	15	1
	Total	60	4

Reference Books:

1. Ali, M. Athar, - Mughal Nobility under the Aurangzeb, Asia Publication, Mumbai, 1970.
2. Khan, A.R.- Chieftains in the Mughal Empire during the reign of Akbar, IAS, Simla, 1977.
3. Habib , Muhammad - Politics and Society in early Medieval period Vols. I & II
4. Chitnis, K.N.- Glimpses of Medieval Indian Ideas and Institutions.
5. Catherine, Asher - Architecture of Mughal India, Cambridge, 1992.
6. Arasaratnam, S. Martime - India in the Seventeen Century, OUP, New Delhi, 1994.
7. Dasgupta, Ashin - Indian Merchants and the Decline of Surat, C. 1700-1750, Manohar Pub., New Delhi, 1994.
8. Irfan Habib, Medieval India
9. Chitnis, K.N.- Social- Economic Aspects of Medieval India, Pune, 1974.
10. Hassan, Narul S - Thoughts on Agrarian Relations in Mughal India, PPH, New Delhi, 1973.

Marathi References

- i. K. N. Chitnis , Madhyayugin Bharatiya Sankalpana va Sanstha
- ii. Murland , Akbar te Aurangzeb
- iii. Dr. S. P. Shinde, Prof. Vishwnath Pawar, Mughalkalin Bhartacha Itihas, Phadke Prakashan, Kolhapur-2012
- iv. Kshattivar , Madhyayugin Bharat
- v. Dhavale Bargal, Madhyayugin Bharat
- vi. A. R. Kulkarni , Marathyacha Itihas
- vii. V. K. Rajvade , Marathyanchya Itihasachi Sadhne
- viii. P.V. Kate , Madhyayugin Bhartacha Itihas

Vivekanand College , Kolhapur (Autonomous)
Syllabus for B.A. III. History (Hons) w.e.f. June 2020

Sem. V. Paper No. VIII
History of USA (1776-1865)

B.A.III- DSC-1020 E-2

COs	On completion of the course, students will be able:
CO: I	To examine the American revolution & its various aspects.
CO: II	To get acquainted with silent features of American Constitution.
CO: III	To evaluate the American Sectional Conflicts and Civil War.
CO: IV	To understand American Civil war.

Module No.	Name of Unit	Teaching Hours	Credits
1.	<u>American Revolution</u> a) Colonial Background , b) War of Independence - its nature , Significance and interpretations	15	1
2.	<u>Making of the constitution</u> a) Issues and debates, b) Nature and significance	15	1
3.	<u>Evolution of American democracy</u> a) Jeffersonianism and Jacksonism : Political Parties 1840-1860, b) Role of judiciary, c) Limitations of the American democratic system d) Blacks & Women's	15	1
4.	<u>Sectional Conflicts and Civil War</u> a) Base of conflict: plantation economy b) Slave society and resistance c) Civil war- issues and interpretation d) Lincoln's role in the war and emancipation of slavery	15	1
	Total	60	4

Vivekanand College , Kolhapur (Autonomous)
Syllabus for B.A. III. History (Hons) w.e.f. June 2020
Sem. VI. Paper No. XIII
History of USA (1865-1945)

B.A.III- DSC-1020 F-2

COs: After Completion of this course, student will be able to:

CO: I To study the American economic changes and Growth of capitalism

CO: II To criticize first world war and its consequences on America with the help of economic crises and new deal.

CO: III To analyse the Emergence of USA as an imperial power.

CO IV: To study the highlights of America between two world war's

Module No.	Name of Unit	Teaching Hours	Credits
1.	<u>Module. I Reconstruction</u> a) Varieties Presidential b) Radical and congressional plans c) The emergence of new south	15	1
2.	<u>Module. II Economic Changes</u> a) Growth of capitalism and big business b) Labour movements and unionization c) Changes in agriculture d) Progressive era - Theodore Roosevelt, Woodrow Wilson.	15	1
3.	<u>Module. III Emergence of USA as an imperial power</u> a) Growth Monroe doctrine in practice b) Spanish -American war c) Interest in the Far East and Latin America d) World war I and Wilson's fourteen points	15	1
4.	<u>Module. IV America between two world war's</u> a) Growth Economic depression and the New Deal b) Black and Women's movement c) Entry into World War II and its consequences	15	1
	Total	60	4

Reference Books: -

1. Bernard Bailyn, The Ideological Origins of the American Revolution.
2. Charles Beard, An Economic Interpretation of the American Constitution.
3. Peter Carroll and David Noble, Free and Unfree: A New History of the United States.
4. David B. Davis, The Problem of Slavery in the Age of Revolution.
5. U. Faulkner, American Economic History.
6. Robert Fogel, Railroads and American Economic Growth.
7. Eric Foner, America's Black Past.
8. John Hope Franklin, From Slavery to Freedom.
9. Gerald N. Grobb and George A. Billias, Interpretations of American History: Patterns and Perspectives, 2 Vols.
10. Dwijendra Tripathi and S.C. Tiwari, Themes and Perspectives in American History.

Marathi References:

- i. Bhavre, Devpujari , Americecha Itihas
- ii. Shri Devdhar Y. N. Americah Itihas - I
- iii. Dr. Vakkani N. A , Adhunik Americecha Itihas
- iv. Dr. Shanta Kotekar, American Sanghrajyacha Itihas
- v. Dr. Lata Aklujkar, Shri Srikant Deshpande, Dr. Nabha Kakade, Americecha Itihas , Aksharlen Prakashan , Solapur, 2005
- vi. Dr. Vijay Nalavade , Prof. Vishwnath Pawar, Americecha Itihas, Phadke Prakashn, Kolhapur, 2012

Vivekanand College, Kolhapur (Autonomous)
Syllabus for B.A. III. History (Hons) w.e.f. June 2020
Sem. V. Paper No. IX
India Since Independence-I

B.A.III- DSC-1020 E-3

COs: After Completion of this course, student will be able to:

CO: I To examine the transformation of congress into a political party.

CO: II To criticize the internal policy and foreign policy of Prime Ministers of India.

CO: III To get acquainted with emergency, its nature, scope and impacts.

CO IV: To study agrarian reforms in post independent India.

Module No.	Name of Unit	Teaching Hours	Credits
1.	<u>Module. I Political Parties in brief: Congress-I</u> a) Pandit Nehru b) Indira Gandhi	15	1
2.	<u>Module. II Political Parties in brief: Congress-II</u> a) Rajiv Gandhi b) P. V. Narsimharao	15	1
3.	<u>Module III. Other political parties in brief</u> a) Janata Party: Morarji Desai b) Janata Dal: V. P. Singh c) BJP: Atal Bihari Vajpayee	15	1
4.	<u>Module. IV Agriculture (1947-1991)</u> a) Land reforms: Zamindari Abolition, Land Ceiling, Bhoodan Movement b) Green revolutions c) Agrarian struggles: Telangana (Andra Pradesh) , Shetkari Sanghatana (Maharashtra)	15	1
	Total	60	4

Vivekanand College , Kolhapur (Autonomous)
Syllabus for B.A. III. History (Hons) w.e.f. June 2020
Sem. VI. Paper No. XIV
India Since Independence-II

B.A.III- DSC-1020 F-3

COs	On completion of the course, students will be able:
CO: I	To examine the changing facets of post independent Indian economy with the help of five-year plans.
CO: II	To criticize the foreign policy of India.
CO: III	To get acquainted with socio-environmental and political movements in India.
CO: IV	To understand Feminism and Subaltern movements in India.

Module No.	Name of Unit	Teaching Hours	Credits
1.	<u>Module. I Post Independent Economy</u> a) Five-year Plans b) Industrial Development: - Cotton, Steel and Cement c) Trade: Import & Export	15	1
2.	<u>Module II. Foreign policy</u> a) Principles of Indian Foreign Policy b) Non alignment movement c) India's role in international politics: U.S.A and U.S.S.R	15	1
3.	<u>Module. III. Problems</u> a) Students unrest: Nav Nirman Andolan b) Emergency, role of Jaiprakash Narayan c) Terrorism in Punjab	15	1
4.	<u>Unit IV. Movements</u> a) Environmental Movement b) Women's movements: Manjushri Sarda Case and Bhavridevi Case c) Movements of Depressed Classes: Namantar Chalval	15	1
	Total	60	4

Reference books:

- 1) Bipan Chandra, Mridula Mukherjee, Aditya Mukherjee, India since independence, Penguin Books, New Delhi , 2000
- 2) P S Joshi , S. V. Gholkar , History of Modern India from 1800 to 1964, S Chand Publication, New Delhi,1983
- 3) Rajni Kothari, Politics in India, New Delhi, 1970
- 4) Francine R. Frankel, India's Political Economy, 1947-1977, Delhi, 1978
- 5) Kedarnath Prasad Indian Economy Since Independence: A 50 years' Profile, National Publishing House, 1997
- 6) Rajni Kothari, Politics in India, New Delhi, 1970
- 7) Yogendra Singh, Social Change in India, New Delhi, 1993
- 8) A C Chatterji: India's Foreign Policy

Marathi References:

- i. Y. N. Kadam, Dr. Arun Bhosle, Swatrantyottar Bharat I & II , Phadke Prakashnan, Kolhapur, 2015
- ii. Y. N. Kadam , Adhunik Bhartacha Itihas, Phadke Prakashan, Kolhapur 2013
- iii. Dr. Suman Vaidya Shanta Kotekar, Swatantr Bhartacha Itihas, Nagpur., 1988
- iv. Dr. G. V. Kayande Patil, Krushi Arthashastra, Chaitnya Publication, Nashik
- v. Dr. Desai , Dr. Bhalerao, Bharatiya Arthvyavstha
- vi. Y. N. Kadam, Antarrashtriya Rajkaranat Bharat, Phadke Prakashan , Kolhapur,2009

Vivekanand College , Kolhapur (Autonomous)
Syllabus for B.A. III. History (Hons) w.e.f. June 2020
Sem. V. Paper No. X
History of the Marathas (1630-1818)

B.A.III- DSC-1020 E-4

COs	On completion of the course, students will be able:
CO: I	To examine the changing facets of political conditions of India in 18th century.
CO: II	To study contribution of First Bajirao Peshwe to the expansion of Maratha power.
CO: III	To criticize contribution of Nansahaheb Peshwe to the Maratha empire.
CO: IV	To explore the various aspects of Third war of Panipat.

Module No.	Name of Unit	Teaching Hours	Credits
1.	Module -I. Expansion of the Maratha Power (1707-1720) a) Chh. Shahu b) Peshwe Balaji Vishvnath and his early Achievements c) Maratha Confederacy	15	1
2.	Module -II. Peshwe Bajirao-I (1720-1740) a) Bajirao-I -Relation with Nijam b) Expansion in Northern India c) Relation with Siddhis, Portuguese	15	1
3.	Module -III. Balaji Bajirao/Nansahaheb (1740-1761) a) Nansahaheb - Raghuji Bhosle Relation b) Nansahaheb and Angre Dynasty Struggle c) Karnatak Expeditions and Nijam Relation d) Expansion in Northern India	15	1
4.	Module -IV. Third War of Panipat (1761) a) Causes of war b) Nature , Impact and Importance c) Causes of defeat of Maratha's in Panipat	15	1
	Total	60	4

Vivekanand College , Kolhapur (Autonomous)
Syllabus for B.A. III. History (Hons) w.e.f. June 2020
Sem. VI. Paper No. XV
History of the Marathas (1761-1818)-II

B.A.III- DSC-1020 F-4

COs	On completion of the course, students will be able:
CO: I	To determine the life and works of Madhavrao Peshwa.
CO: II	To study the contributions of Nana Fadanvis and Mahadaji Shinde.
CO: III	To understand with the socio-economic condition during Maratha Regime
CO: IV	To examine the causes of Decline of Maratha empire.

Module No.	Name of Unit	Teaching Hours	Credits
1.	Module -I. Peshwe Madhavrao-I a. Early achievements & struggle with Raghoba b. Relations with Nijam c. Karnataka Expeditions	15	1
2.	Module -II. Political Conditions a. Mahadji Shinde b. Nana Phadnvis	15	1
3.	Module -III. Political Conditions a. Bajirao-II and war with British b. Causes of decline of Maratha Power	15	1
4.	Module -IV. Socio-Economic Conditions a. Social Structure & Condition of women b. Agrarian System: Land Revenue, Irrigation c. Trade & Industry	15	1
	Total	60	4

References:

1. Desai Sudha V., Social life in Maharashtra under the Peshawas, Popular Prakashan, Mumbai.
2. Kulkarni A. R., Maharashtra in the Age of Shivaji, Sudha Prakashan Pune.
3. Majumdar R.C. (Gen.ed), Dighe V.G.(ed.), The Maratha Supremacy, The History & the Culture of the Indian People, Vol.VIII., Bharatiya Vidya Bhavan, Mumbai.
4. Mate M.S., Maratha Architecture , Mansanman Prakashan, Pune.
5. Ranade M.G., Rise of the Maratha Power, Publications Division, New Delhi.
6. Sardesai G.S., New History of the Marathas, Vo I, II. and III., Phoenix Publication, Bombay.
7. Sarkar J. N., Shivaji and His Times, Orient Longman, New Delhi.
8. Sen S.N., Administrative system of the Marathas, University of Calcutta.
9. Sen S. N., Military System of the Marathas, K. P. Bagchi & Company, Calcutta.

Vivekanand College , Kolhapur (Autonomous)
Syllabus for B.A. III. History (Hons) w.e.f. June 2020
Sem. V. Paper No. XI
Research in History

B.A.III- DSC-1020 E-5

COs: After Completion of this course, student will be able:

CO: I To study and adequate with the nature, scope and importance of History

CO: II To criticize and evaluate the sources and tools of historical research

CO: III To Study and Examine the steps and process of writing history

CO: IV To inculcate research ethics & burden the research aptitude among students.

Module No.	Name of Unit	Teaching Hours	Credits
1.	<u>Module I. Introduction to History</u> a) Meaning of History b) Kinds of History c) Auxiliary Sciences	15	1
2.	<u>Module II. Acquisition of Historical Data</u> a) Survey, Interview, questionnaire b) Archives and Newspapers c) Internet, Radio, T.V., Short films Unit	15	1
3.	<u>Module . III Process of History Writing</u> a) Selection of Topic b) Chapter scheme c) Evaluation of Sources d) Presentation Unit	15	1
4.	<u>Module IV. Tools of Writing History</u> a) Notes Taking and end notes b) Index and bibliography c) Dating	15	1
	Total	60	4

(Visit to Historical Monuments, Museums & or Places is Compulsory with Report Writing)

Vivekanand College , Kolhapur (Autonomous)
Syllabus for B.A. III. History (Hons) w.e.f. June 2020
Sem. VI. Paper No. XVI
Applications of History

B.A.III- DSC-1020 F-5

COs	On completion of the course, students will be able:
CO: I	To study the historical developments of Museology.
CO: II	To explore the historical developments of Tourism Industry.
CO: III	To understand the application of history with reference to Archives, Museums & Tourism Industry.
CO: IV	To prepare students for competitive and civil examinations.
CO: V	To inculcate research ethics & burden the research aptitude among students.

Module No.	Name of Unit	Teaching Hours	Credits
1.	<u>Module I. Museums</u> a) Definition and nature of Museum b) Types of Museums c) Study of Chhatrapati Shivaji Maharaj Vastusangrahalaya (Prince of Wales) d) Study of Town Hall Museum (Kolhapur)	15	1
2.	<u>Module II. Historical Tourism</u> a) Tourism : Concept and Nature b) Importance of Tourism for History c) Destinations: 1)Ajanta and Ellora , Raigad	15	1
3.	<u>Module III. Conservation and Preservation</u> a) Documents b) Paintings c) Monuments	15	1
4.	<u>Module IV. Careers in History</u> a) Tourism Industry b) Museums and Archives c) Importance of History for the preparation of Competitive Examinations	15	1
	Total	60	4

(Visit to Historical Monuments, Museums & or Places is Compulsory with Report Writing)

Reference Books:

1. Ali Sheikh,B., History :Its theory and Method, (2nd Edition) Macmillan India Ltd.,Mumbai,1984.
2. Carr, E.H.,What is History .Palgrave Hampshire Macmillan & Co., London.,Reprint 2001, First Publication-1969.
3. Chitins ,K.N. Research Methodology in History.Pune,1979.
4. Jain Gopal Lal., Research Methodology: Methods, Tools and Techniques, Jaipur.2003.
5. Punja, Shobita, An Illustrated Guide to Museums of India .Hong Kong: The Guidebook Company Limited, 1990
6. Kothari ,C.R., Research Methodology: Method and Techniques, New Delhi,2001.
7. Bakshi, Smita J. and Dwivedi,C.P.- Modern Museums, Abhinav Publication, New Delhi, 1973.
8. Dwivedi, C. P. and Pant , G. N. – Museums and Museology , New Horizon, New Delhi, 1980.
9. Singh, Ashok -Cultural Tourism in India , Raj Book Enterprise, Jaipur, 2002.
10. Raina, A.K., Jain Nilu – Dynamic of Tourism, Kanishka Publication, New Delhi, 2010.
11. Nagraju,S. – Buddhist Architecture of western India, Agam Kala Prakashan, New Delhi, 1981

Marathi References

- i. Dr. Prabhakar Dev - Itihas Shashtra
- ii. Shanta Kotekar- Itihas Tantra va Tatvadnyan
- iii. S. M. Garge- Itihasachi Sadhane
- iv. Dr. B. N. Sardesai- Itihaslekhan Parichay
- v. Sadashiv Athavale- Itihasache Tatvadnyan
- vi. V. S. Bandre- Sadhan Chikitsa
- vii. Gaikwad , Sardesai, Vanmane – Aitihāsik Kagadpatre va Sthle Yancha
Abhyas

Vivekanand College , Kolhapur (Autonomous)

Syllabus for B.A. III. History (Hons) w.e.f. June 2020

Semester. V.

Indian Art & Architecture -I

B.A.III- SEC- AE

COs	On completion of the course, students will be able:
CO: I	To study the various Indian Arts and architecture.
CO: II	To adequate with Indian fine Arts and Literature.
CO: II	To criticize and evaluate the importance of historical sites and museums.
CO: III	To examine the necessity of art and architecture in the reconstruction of history.

SEC-E Art Appreciation: an Introduction to Indian Art-I

I. Prehistoric and proto historic art: Rock art; Harappan arts and crafts

II. Indian art (c. 600 BCE – 600 CE):

World Heritage Site Managers, UNESCO World Heritage Manuals

[Can be downloaded/ accessed at www.unesco.org]

Notions of art and craft Canons of Indian paintings Major developments in stupa, cave, and temple art and architecture Early Indian sculpture: style and iconography numismatic art

Essential Readings:

- Neumayer, Erwin, Lines of Stone: The pre-historic rock-art of India, South Asia Books, 1993
- Goswamy, B.N., Essence of Indian Art, Asian Art Museum of San Francisco, 1986
- Huntington, Susan, The Art of Ancient India: Hindu, Buddhist, Jain, Weatherhill, 1985
- Guha-Thakurta, Tapati, The making of a new modern Indian art: Aesthetics and nationalism in Bengal, 1850-1920, Cambridge University Press, 1992

Vivekanand College , Kolhapur (Autonomous)

Syllabus for B.A. III. History (Hons) w.e.f. June 2020

Sem. VI.

Indian Art & Architecture -II

B.A.III- SEC- AF

COs	By the end of this course, the student will be able:
CO: I	To adequate with the archaeological sources of history.
CO: II	To criticize the importance of historical sites.
CO: III	To examine the process of reconstruction of history.
CO: IV	To study the importance of paintings in history.

SEC-E Art Appreciation: an Introduction to Indian Art-II

I. Indian Art (c. 600 CE - 1200 CE) :

Temple forms and their architectural features early illustrated manuscripts and mural painting traditions early medieval sculpture: style and iconography Indian bronzes or metal icons

II. Indian art and architecture (c. 1200 CE - 1800 CE) :

Sultanate and Mughal architecture Miniature painting traditions: Mughal, Rajasthani, Pahari Introduction to fort, palace and haveli architecture

III. Modern and Contemporary Indian art and Architecture:

The Colonial Period Art movements: Bengal School of Art, Progressive Artists Group, etc. Major artists and their artworks Popular art forms (folk art traditions)

Suggested Readings:

- Mitter, Partha, Indian Art, Oxford History of Art series, Oxford University Press, 2001
- Dhar, Parul Pandya, ed., 2011, Indian Art History Changing Perspectives, New Delhi: D.K. Printworld and National Museum Institute (Introduction).
- Beach, M.C., The New Cambridge History of India I: 3, Mughal and Rajput Painting, Cambridge University Press, 1992.
- Ray, Niharranjan, An Approach to Indian Art, Calcutta, 1970

Vivekanand College, Kolhapur (Autonomous)

History- B.A. III

Sem. V & Sem. VI

Structure of Question Paper

Discipline Specific Course

Total Marks = 40

Time=2.00 hours

* All Questions are compulsory (Based on all Modules)

Q.1	A. Multiple Choice Questions	05 Marks
	B. Match the Pair	05 Marks
Q.2	Short notes (Any 2)	10 Marks
Q.3	A. Broad Answer Question	10 Marks
	B. Broad Answer Question	10 Marks
	Total	40 Marks

Internal Evaluation: 10 Marks

Sr. No	Evaluation Type	Marks
1.	Departmental Activities	(10 Marks each activity)
2.	Project & Viva Voce	Paper wise internal marks
3.	Field visits & Report writings	activity may changes
4.	Group Discussion	
5.	Student Seminar with lesson note	
	Total	10

Exam Pattern

Sem.	Theory Marks	Internal Evaluation	Total
V	40	10	50
VI	40	10	50

“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF ZOOLOGY

B.Sc. Part - III
Semester-V & VI

SYLLABUS

Under Choice Based Credit System

to be implemented from Academic Year 2020-21

B.Sc. -III (Sem - V and VI) Zoology

Course Structure

Paper No.	Course code	Title of Old Paper	Title of New Paper	Percentage of Change (%)	No. of Credits
Semester V					
V	DSE - 1008E1	Functional anatomy of non-chordates	Animal Biotechnology Section- I	100%	04
		Biostatistics, Bioinformatics and Medical Zoology	Animal Biotechnology Section- II	100%	04
VI	DSE - 1008E2	Molecular Biology, Biotechnology and Biotechniques	Applied zoology Section- I	100%	04
		Endocrinology, Environmental Biology and toxicology	Applied zoology Section- II	100%	04
	SEC- 1008C	-	Research Methodology	-	02
	AECC	-	English	-	04
Semester VI					
VII	DSE- 1008F1	Comparative Anatomy of Vertebrates	Ecology & Aquatic Biology Section-I	100%	04
		Developmental Biology	Ecology & Aquatic Biology Section-II	100%	04
VIII	DSE- 1008F2	Physiology	Immunology Section-I	100%	04
		Applied Zoology	Immunology Section-II	100%	04
	SEC- 1008D	-	Sericulture	-	02
	AECC	-	English	-	04

B. Sc. Part-III CBCS
Semester-V Paper- V
Animal Biotechnology (DSE -1008E1)

Theory: 72 Hours (92 lectures of 48 minutes)

Credits - 04

Course Outcomes: After the completion of the course the student will be able to -

CO1: Understanding the Molecular Biology.

CO2: Understand the techniques Molecular Biology.

CO3: Understand the biotechniques use in human welfare.

CO4: Understand production of cloned animals.

CO5: Understanding the cell and tissue culture techniques.

Section I

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Introduction Concept and scope of biotechnology DNA structure, DNA replication, Transcription and Translation	15	02
Module 2	Molecular Techniques in Gene manipulation Cloning vectors: Plasmids, Cosmids, Phagemids, Lambda, Bacteriophage, BAC, MAC and Expression vectors (Characteristics) Restriction enzymes: Nomenclature, detailed study of Type II. Transformation techniques: Calcium chloride method and Electroporation. Construction of genomic and cDNA libraries and screening by colony and plaque hybridization Southern, Northern and Western blotting; DNA sequencing: Sanger method, Polymerase Chain Reaction, DNA finger printing	21	

Section II

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 3	<p>Genetically Modified Organisms</p> <p>Production of cloned and transgenic animals: Nuclear Transplantation, Retroviral Method, DNA microinjection</p> <p>Applications of transgenic animals: Production of pharmaceuticals, production of donor organs, knockout mice.</p> <p>Production of transgenic plants: Agrobacterium mediated transformation.</p> <p>Applications of transgenic plants: insect and herbicide resistant plants</p>	18	01
Module 4	<p>Culture Techniques and Applications</p> <p>Animal cell culture: 1. Cell culture techniques and types 2. Requirements 3. Types of media 4. Sterilization technique 5. Stem cell culture 6. Application</p> <p>Molecular diagnosis of genetic diseases (Cystic fibrosis, Sickle cell anemia)</p> <p>Recombinant DNA in medicines: Recombinant insulin and human growth hormone, Gene therapy</p> <p>Microtechnique, Application of biotechnology in animal husbandry, medicine and agriculture</p>	18	01

Reference Books:

1. Brown, T.A. (1998). Molecular Biology Labfax II: Gene Cloning and DNA Analysis. II
2. Edition, Academic Press, California, USA.
3. Glick, B.R. and Pasternak, J.J. (2009). Molecular Biotechnology - Principles and
4. Applications of Recombinant DNA. IV Edition, ASM press, Washington, USA.
5. Griffiths, A.J.F., J.H. Miller, Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2009).
6. An Introduction to Genetic Analysis. IX Edition. Freeman and Co., N.Y., USA.
7. Snustad, D.P. and Simmons, M.J. (2009). Principles of Genetics. V Edition, John

Wiley and Sons Inc.

8. Watson, J.D., Myers, R.M., Caudy, A. and Witkowski, J.K. (2007). Recombinant DNA Genes and Genomes- A Short Course. III Edition, Freeman and Co., N.Y., USA.
9. Beauchamp, T.I. and Childress, J.F. (2008). Principles of Biomedical Ethics. VI Edition
10. Oxford University Press

B. Sc. Part-III CBCS
Semester -V Paper- VI
Applied Zoology (DSE -1008E2)

Theory: 72 Hours (92 lectures of 48 minutes)

Credits - 04

Course Outcomes: After the completion of the course the student will be able to -

CO1: To understand the parasite, life cycle and diseases

CO2: To understand the economic importance of insects

CO3: To understand the economic importance of fishes and aquaculture techniques

CO4: Study and understand various pests and its management

CO5: Dairy farming, Poultry farming, Goat farming and its economic importance

Section I

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Introduction to Host-parasite Relationship Host, Definitive host, Intermediate host, Parasitism, Types of Parasites, Symbiosis, Commensalism, Reservoir, Zoonosis, Types of parasites	08	02
Module 2	Epidemiology of Diseases Transmission, Prevention and control of diseases: Tuberculosis, Typhoid, Dengue & swine flue	08	
Module 3	Parasitic Protozoa Life history and pathogenicity of Entamoeba histolytica, Plasmodium vivax, Trichomonas	08	
Module 4	Insects of Economic Importance Biology, Control and damage caused by <i>Helicoverpa armigera</i> , <i>Pyrilla perpusilla</i> and <i>Papilio demoleus</i> , <i>Callosobruchus chinensis</i> , <i>Sitophilus oryzae</i> and <i>Tribolium castaneum</i> , milibug, aphids and white fly	12	

Section II

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 5	Insects of Medical Importance Medical importance and control of <i>Pediculus humanus corporis</i> , <i>Anopheles</i> , <i>Culex</i> , <i>Aedes</i> , <i>Xenopsylla cheopis</i>	06	02
Module 6	Dairy technology Selection of breed, Types of breeds, (4 exotic and 4 indigenous), Management, Food, fodder and Shelter	06	
Module 7	Poultry Farming Principle of poultry breeding, Types of poultry breeds broilers & Layers, Management, Feeding, Shelter, processing and preservation of eggs, Back yard poultry forming	06	
Module 8	Fish Technology Fish farming construction & Maintenance. Induced breeding and transportation of fish seed	07	
Module 9	Animal feed preparation Cattle feed, rat feed, fish feed, poultry feed	06	
Module 10	Animal and Crop waste Management Poultry waste management, Sugarcane and wheat waste management	05	

Reference Books:

1. Park, K. (2007). Preventive and Social Medicine. XVI Edition. B.B Publishers.
2. Arora, D. R and Arora, B. (2001). Medical Parasitology. II Edition. CBS Publications and Distributors.
3. Kumar and Corton. Pathological Basis of Diseases.
4. Atwal, A.S. (1986). Agricultural Pests of India and South East Asia, Kalyani Publishers.
5. Dennis, H. (2009). Agricultural Entomology. Timber Press (OR).
6. Hafez, E. S. E. (1962). Reproduction in Farm Animals. Lea & Fabiger Publisher
7. Dunham R.A. (2004). Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications, U.K.
8. Pedigo, L.P. (2002). Entomology and Pest Management, Prentice Hall.

B. Sc. Part-III CBCS
Semester-V
Skill Enhancement Course
Research Methodology (SEC -1008C)

Theory- 30 Hours

Credits - 02

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Foundations of Research Meaning, Objectives, Motivation: Research Methods vs Methodology, Types of Research: Analytical vs Descriptive, Quantitative vs Qualitative, Basic vs Applied	05	02
Module 2	Research Design Need for research design: Features of good design, Important concepts related to good design Observation and Facts, Prediction and Explanation, Development of Models. Developing research plan: Problem identification, Experimentation, Determining experimental and sample designs	08	
Module 3	Data Collection Observation and Collection of Data-Methods of data collection- Sampling Methods, Data Processing and Analysis Strategies, Technical Reports and Thesis writing, Preparation of Tables and Bibliography. Data Presentation using digital technology	12	
Module 4	Ethical Issues Intellectual property Rights, Commercialization, Copy Right, Royalty, Patent law, Plagiarism, Citation, Acknowledgement	05	

Reference Books:

1. Anthony, M, Graziano, A.M. and Raulin, M.L. 2009. Research Methods: A Process of Inquiry, Allyn and Bacon.
2. Walliman, N. 2011. Research Methods- The Basics. Taylor and Francis, London, New York.
3. Wadhwa, B.L.: Law Relating to Patents, Trade Marks, Copyright Designs and Geographical

Module 3	Marine Biology Salinity and density of Sea water, Continental shelf, Adaptations of deep-sea organisms, Coral reefs, Sea weeds.	08	
----------	---	----	--

Section II

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 4	Freshwater Biology Lakes: Origin and classification, Lake as an Ecosystem, Lake morphometry, Physico-chemical Characteristics: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity; dissolved gases (Oxygen, Carbon dioxide). Nutrient Cycles in Lakes-Nitrogen, Sulphur and Phosphorous.	16	02
Module 5	Streams and their conservation Different stages of stream development, Physico-chemical environment, Adaptation of hill-stream fishes and Conservation of streams	05	
Module 6	Management of Aquatic Resources Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills, Eutrophication, Management and conservation (legislations), Sewage treatment, Water quality assessment- BOD and COD.	15	

Reference Books:

1. Anathakrishnan : Bioresources Ecology 3rd Edition
2. Goldman : Limnology, 2nd Edition
3. Odum and Barrett : Fundamentals of Ecology, 5th Edition
4. Pawlowski : Physicochemical Methods for Water and Wastewater Treatment, 1st Edition
5. Wetzel : Limnology, 3rd edition
6. Trivedi and Goyal : Chemical and biological methods for water pollution

studies

7. Welch : Limnology Vols. I-II

**B. Sc. Part-III CBCS
Semester-VI Paper- VIII
Immunology (DSE-1008F2)**

Theory: 72 Hours (92 lectures of 48 minutes)

Credits - 04

Course Outcomes: After the completion of the course the student will be able to -

CO1: Understand about basic knowledge about immune system

CO2: Understand the functioning of immune system and good health

CO3: Student can explain the immune response

CO4: Able to understand vaccine preparation, antigen and antibody

CO5: Understand concept of tumor immunology and transplantation immunology

Section I

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Overview of the Immune System Introduction to basic concepts in immunology, components of immune system, principles of innate and adaptive immune system	10	02
Module 2	Cells and Organs of the Immune System Haematopoiesis, Cells of immune system and organs (primary and secondary lymphoid organs) of the immune system	09	
Module 3	Antigens Basic properties of antigens, B and T cell epitopes, haptens and adjuvants	08	
Module 4	Antibodies Structure, classes and function of antibodies, hybridoma technology, monoclonal antibodies, Hybridoma technology, antigen antibody interactions as	09	

	tools for research and diagnosis, ELISA & its types		
--	--	--	--

Section II

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 5	Working of the immune system Structure and functions of MHC, exogenous and endogenous pathways of antigen presentation and processing, basic properties and functions of cytokines, Complement system: Components and pathways.	15	02
Module 6	Immune system in health and disease Gell and Coombs' classification and brief description of various types of hypersensitivities, Introduction to concepts of autoimmunity and immunodeficiency and Autoimmune disorders	15	
Module 7	Vaccines General introduction to vaccines, types of vaccines, production of vaccines	06	

Reference Books:

1. Kindt, T. J., Goldsby, R.A., Osborne, B. A. and Kuby, J (2006). Immunology, VI Edition. W.H. Freeman and Company.
2. David, M., Jonathan, B., David, R. B. and Ivan R. (2006). Immunology, VII Edition, Mosby, Elsevier Publication.
3. Abbas, K. Abul and Lechtman H. Andrew (2003.) Cellular and Molecular
4. Immunology. V Edition. Saunders Publication

B. Sc. Part-III CBCS
Semester-VI
Skill Enhancement Course
Sericulture (SEC -1008D)

Theory- 30 Hours

Credits - 02

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Introduction Sericulture: Definition, history and present status; Silk route Types of silkworms, Distribution and Races Exotic and indigenous races Mulberry and non-mulberry Sericulture	03	02
Module 2	Biology of Silkworm Life cycle of Bombyx mori Structure of silk gland and secretion of silk	03	
Module 3	Rearing of Silkworms Selection of mulberry variety and establishment of mulberry garden Rearing house and rearing appliances Disinfectants: Formalin, bleaching powder, RKO Silkworm rearing technology: Early age and Late age rearing Types of mountages Spinning, harvesting and storage of cocoons	13	
Module 4	Pests and Diseases Pests of silkworm: Uzi fly, dermestid beetles and vertebrates Pathogenesis of silkworm diseases: Protozoan, viral, fungal and bacterial Control and prevention of pests and diseases	04	
Module 5	Entrepreneurship in Sericulture Prospectus of Sericulture in India: Sericulture industry in different states, employment, potential in mulberry and non-mulberry sericulture. Visit to various	02	

Reference Books:

1. Handbook of Practical Sericulture: S.R. Ullal and M.N. Narasimhanna CSB, Bangalore
2. Appropriate Sericultural Techniques; Ed. M. S. Jolly, Director, CSR & TI, Mysore.
3. Handbook of Silkworm Rearing: Agriculture and Technical Manual-1, Fuzi Pub. Co. Ltd., Tokyo, Japan1972.
4. Manual of Silkworm Egg Production; M. N. Narasimhanna, CSB, Bangalore 1988.
5. Silkworm Rearing; Wupang – Chun and Chen Da-Chung, Pub. By FAO, Rome 1988.
6. A Guide for Bivoltine Sericulture; K. Sengupta, Director, CSR & TI, Mysore 1989.
7. Improved Method of Rearing Young age silkworm; S. Krishnaswamy, reprinted CSB, Bangalore, 198Coley, S.M. and Scheinberg, C.A. 1990, "Proposal writing". Stage Publications.
- 8.

B. Sc. Part - III CBCS
Semester - V Paper- V
ZOOLOGY LAB (I): DSE -1008E1 (Practical I)
Practicals based on
Animal Biotechnology (DSE -1008E1)
60 Hours (75 lectures of 48 minutes)- Credits-04

1. Genomic DNA isolation from E. coli
2. Plasmid DNA isolation (pUC 18/19) from E. coli
3. Restriction digestion of plasmid DNA.
4. Construction of circular and linear restriction map from the data provided.
5. TLC-Thin Layer chromatography
6. Microtechnique (Any two slide)
7. Separation of protein by SDS-PAGE
8. Separation of DNA by Agarose gel electrophoresis
9. Study the following technique through photograph
10. Southern Blotting, Northern blotting, western blotting, DNA sequencing, PCR, DNA finger printing
11. To study following Instruments.
 - a) pH meter b) Spectrophotometer c) Calorimeter d) Cooling Centrifuge
 - e) Laminar Air flow f) CO₂ incubator
12. Project report on animal cell culture
13. Visit to tissue culture laboratory and biofertilizer industry

Reference Books:

1. Primrose S.B. and R.M. Twyman. Principles of Gene manipulation and Genomics. 7th Ed.2006 Blackwell Publishing 667p

2. Sandy B. Primrose, Richard Twyman, Bob Old. Principles of Gene Manipulation: An Introduction to Genetic Engineering. 6th Ed.2001 Wiley Blackwell Publishing 667
3. T. A. Brown: Gene Cloning and DNA Analysis: An Introduction. 8th Ed.2020.Wiley-Blackwellpubling 395p.
4. Monika Jain. Recombinant DNA Techniques: A Textbook.2012. Alpha Science International Ltd; 1st edition,288pp.

B. Sc. Part – III CBCS
Semester - V Paper- VI
ZOOLOGY LAB (I): DSE -1008E2 (Practical II)
Practicals based on
Applied Zoology (DSE -1008E2)
60 Hours (75 lectures of 48 minutes)- Credits-04

1. Study of *Plasmodium vivax*, *Entamoeba histolytica*, and their life stages through permanent slides/photomicrographs or specimens.
2. Study of arthropod vectors associated with human diseases: *Pediculus*, *Culex*, *Anopheles*, *Aedes* and *Xenopsylla*.
3. Study of insect damage to different plant parts/stored grains through damaged products/photographs.
4. Identifying feature and economic importance of *Helicoverpa (Heliothis) armigera*, *Papilio demoleus*, *Pyrilla perpusilla*, *Callosobruchus chinensis*, *Sitophilus oryzae* and *Tribolium castaneum*.
5. Media preparation of microbial culture and cultivation of microbes for decomposition of poultry and crop waste-wheat and sugarcane
6. Study of dairy products
7. Types of cattles breed
8. Types of poultry breeds
9. Types of cattle breeds
10. Types of Poultry breeds
11. Dairy byproducts
12. Visit to poultry farm or cattle farm. Submission of visit report

Reference Books:

1. Economic Zoology. G. S. Shukla and V. B. Upadhyay, Rastogi Pub., Meerut.
2. Economic and Applied Entomology. Kumar and Nigam, Emkay Pub., Delhi.
3. Atwal, A.S. (1986). Agricultural Pests of India and South East Asia, Kalyani Publishers.
4. Dennis, H. (2009). Agricultural Entomology. Timber Press (OR).

B. Sc. Part - III CBCS
Semester - VI Paper- VII
ZOOLOGY LAB (I): DSE -1008F1 (Practical III)
Practicals based on
Aquatic Biology (DSE -1008F1)
60 Hours (75 lectures of 48 minutes)- Credits-04

1. Study of Pond Ecosystem on field
2. Identify the important macrophytes, phytoplanktons and zooplanktons present in a lake ecosystem.
3. Determine the amount of Turbidity/transparency, Dissolved Oxygen, Free Carbon dioxide, Alkalinity (carbonates & bicarbonates), Hardness in water collected from a nearby lake/ water body.
4. Instruments used in limnology (Secchi disc, Van Dorn Bottle, Conductivity meter, Turbidity meter, PONAR grab sampler) and their significance with the help of photographs.
5. O₂ consumption by any aquatic animal
6. Determine the BOD & COD of water sample.
7. A Project Report on a visit to a Sewage treatment plant/Marine bioreserve/ Fisheries Institutes.

Reference Books:

1. Raymont, J.E.G., 1973. Plankton and Productivity in the Oceans. Pergamon Press, London.
2. Riley, J.P. and R. Chester, 1971. Introduction to Marine Chemistry. Academic Press, London.

3. Shalini Verma, 2015. Basic Limnology and Fish Biodiversity, Random Publishers, New Delhi.
4. Tonapi, G.T. 1980. Freshwater Animals of India. Oxford & IBH Publ. Co., New Delhi, 341 pp.
5. Tundisi, J.G. and T.K. Tundisi, 2012. Limnology. CRC Press (Taylor and Francis Group, London 864pp

B. Sc. Part - III CBCS
Semester - VI Paper- VIII
ZOOLOGY LAB (I): DSE -1008E2 (Practical IV)
Practicals based on
Immunology (DSE -1008F2)
60 Hours (75 lectures of 48 minutes)- Credits-04

1. Demonstration of lymphoid organs (Photographs/slides)
2. Histological study of spleen, thymus and lymph nodes through slides/ photographs
3. Preparation of stained blood film to study various types of blood cells
4. Antigen antibody reaction by double immuno-diffusion method
5. ABO blood group determination.
6. Total RBC and WBC count.
7. Demonstration of
 - a) ELISA (Photograph)
 - b) Immunoelectrophoresis (Photograph)

Reference Books:

1. Nagoaba, B. S. & Vedpathak, D. V.: TB of Immunology. '03. Paras Pub., Hyderabad
2. Playfair, J.H. L. et al.: Medical Immunology for students. Churchill Livingstone, UK 17.
3. Rajeshwar Reddy, K. 713 of Immunology. 2007. AITBS Publishers, India
4. Kindt, T. J., Goldsby, R.A., Osborne, B. A. and Kuby, J (2006). Immunology, VI Edition. W.H. Freeman and Company
5. Talwar, G. P.: A Handbook of Practical Immunology. Vikas, New Delhi

EVALUATION PATTERN

Scheme of Marking: Theory

Sem.	Course Code	Marks	Evaluation	Sections	Answer Books	Standard of passing
V	DSE-1008E1	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28 marks)
	DSE-1008E2	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28 marks)
VI	DSE-1008F1	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28 marks)
	DSE-1008F2	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28 marks)

Scheme of Marking: Continuous Internal Evaluation (CIE)

Sem.	Course Code	Marks	Evaluation	Sections	Answer Books	Standard of passing
V	DSE-1008E1	20	Concurrent	-	As per Instruction	35% (7 marks)
	DSE-1008E2	20	Concurrent		As per Instruction	
VI	DSE-1008F1	20	Concurrent	-	As per Instruction	35% (7 marks)
	DSE-1008F2	20	Concurrent		As per Instruction	

Scheme of Marking: Practical

Sem.	Course Code	Marks	Evaluation	Sections	Standard of passing
V AND VI	DSE-1008 E1 and E2 (Pr), SEC-1008C	200	Annual	As per Instruction	35%
	DSE1008 F1 and F2 (Pr), SEC-1008D				

*A separate passing is mandatory

Nature of Question Paper

- Instructions:** 1) All the questions are compulsory.
2) Answers to the two sections should be written in separate answer books.
3) Figures to the right indicate full marks.
4) Draw neat labeled diagrams wherever necessary.

Time: 3 hours

Total Marks: 80

SECTION-I

Q.1. Choose correct alternative.

(8)

i)

A) B) C) D)

ii)

A) B) C) D)

iii)

A) B) C) D)

iv)

A) B) C) D)

v)

A) B) C) D)

vi)

A) B) C) D)

vii)

A) B) C) D)

viii)

A) B) C) D)

Q.2. Attempt any Two.

(16)

A)

B)

C)

Q.3. Attempt any Four

(16)

A)

B)

C)

D)

E)

F)

SECTION-II

Q.4. Choose correct alternative.

(8)

i)

A)

B)

C)

D)

ii)

A)

B)

C)

D)

iii)

A)

B)

C)

D)

iv)

A)

B)

C)

D)

v)

A)

B)

C)

D)

vi)

A)

B)

C)

D)

vii)

- A) B) C) D)

viii)

- A) B) C) D)

Q.5. Attempt any Two.

(16)

A)

B)

C)

Q.6. Attempt any Four

(16)

A)

B)

C)

D)

E)

F)

“Dissemination of Education for Knowledge, Science and Culture”

-Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF ELECTRONICS

B.Sc. Part - III

Semester-V & VI

SYLLABUS

Under Choice Based Credit System

to be implemented from Academic Year 2020-21

B. Sc. Part - III CBCS

Subject: Electronics Semester: V Paper- V

Linear Integrated Circuits and 8051 Microcontroller Interfacing and Embedded C (DSE 1005E1)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits 4

Section - I Linear Integrated Circuits

Course Outcomes: At the end of the course, a student will be able to:

CO1 : Understand the fundamentals of Operational Amplifier.

CO2 : Design various linear and nonlinear circuits using Op-amp.

CO3 : Understand the fundamentals of rectifiers and filters circuits using Op-amp.

CO4 : Understand applications of Phase Locked Loops (PLL).

Unit	Contents	Lectures
Unit 1	Operational Amplifier and Linear IC's Transistor dc amplifier, Differential amplifier, Emitter coupled differential amplifier with its Operation, characteristics and parameters (I/O impedances, common mode and differential mode gain, CMRR), Dual input and single ended output configuration of differential amplifier. Method to improve CMRR (constant current bias and current mirror bias), Introduction to op-amp, block diagram of op-amp, offset balancing technique of op-amp, drift Parameters of op-amp, study of IC741 and comparative study of IC's OP 07, LM324, AD620.	10
Unit 2	Applications of Op-amp Virtual ground concept, Op-amp as inverting and non- inverting amplifier, summing amplifier (adder and subtractor), V to I and I to V converter, voltage follower, bridge amplifier, Differentiator and integrator, log and antilog amplifier. Op-amp as comparator, regenerative comparator (Schmitt trigger), sine wave oscillators (phase shift and Wien -bridge), Triangular wave generator, square and pulse generator. Peak detector, clipping and clamping circuits.	10
Unit 3	Precision Rectifier and Active filters Precision rectifier, Op-amp as precision rectifier, Absolute value precision rectifier. Advantage of active filters over passive filters. Study of filter response (Butterworth, Chebyshev.) Different types of active filters. Study and design of low pass, high pass, band pass and band stop filters	09
Unit 4	Phase Locked Loops (PLL) Block diagram of PLL with functioning of each block, calculation of capture range and lock range frequencies, application of PLL (frequency multiplier, FM modulator, frequency synthesizer and FSK) Study of IC565, IC8038. IC555 timer as variable duty cycle (10% to 90%), sequential timer, ramp generator.	08

Section - II 8051 Microcontroller Interfacing and Embedded C

Course Outcomes: At the end of the course, a student will be able to:

CO1 : Understand the fundamentals and areas of applications for 8051 microcontroller.

CO2 : Interface I/O devices to 8051.

CO3 : Understand serial communication facility in 8051.

CO4 : Design monitoring and control circuits with 8051.

Unit	Contents	Lectures
Unit 1	Introduction to embedded C Advantages and disadvantages of programming in 8051-C & Assembly Language. Data types, operators and loops, I/O programming, Accessing SFR addresses, Logical operation. Data conversion programs, Accessing ROM space, programming for Time delay generation (using timer), external interrupts (Level and edge triggering).	10
Unit 2	Real World Interfacing of 8051 Interfacing to output devices - LED, Relay, LCD, seven segment display, seven segment display (multiplexing mode), DC Motor, Stepper Motor. Interfacing to input devices - Switch, 4X4 matrix keyboard, opto-coupler, thumb wheel switch. Interfacing to DAC0808 and ADC0804.	15
Unit 3	Serial communication in 8051. Serial Port : Serial port of 8051, RS-232 standard and IC MAX-232, Concept of Baud rate, Baud rate in 8051, SBUF register, SCON register, various modes of serial port, Importance of TI and RI flags, programming for data transmission and reception.	05
Unit 4	Applications of 8051 Case study's: i) Gate Emulator (Logic Gate study using microcontroller) ii) Water level controller iii) speed control of DC motor iv) Temperature measurement using LM35, ADC0804, LCD. v)Bluetooth module interfacing. Vi) Speed control of Stepper Motor	08

Reference Books:

1. Integrated Electronics - Millman-Halkias (MGH)
2. Op-Amps and Linear circuits - Ramakant Gaikwad (PHI)
3. Linear Integrated circuit - D Roy Choudhari, Shail Jain, (Wiley Eastern Ltd)
4. The 8051 Microcontroller -K. J. Ayala, (Penram International)
5. The 8051 Microcontroller and Embedded Systems, M. A. Mazadi, J. G. Mazadi, Pearson Education, Asia
6. Programming and customizing the 8051 Microcontroller - MYKE Predko(TMh, New Delhi)
7. C and the 8051: Programming and Multitasking, Schultz, P T R Prentice-Hall, Inc.
8. Embedded C, Michael J. Pont,

B. Sc. Part - III CBCS

Subject: Semester: V Paper-VI

Instrumentation & Antenna and Wave Propagation (DSE 1005E2)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits 4

Section - I Instrumentation

Course Outcomes: At the end of the course, a student will be able to:

CO1 : Classify and explain transducers with examples, including those for measurement of temperature, flow, motion, position and light.

CO2 : Knowledge of sensor and Actuators

CO3 : Analyze the performance characteristics of each instrument

CO4 : Illustrate basic Digital instruments such as Digital voltmeters and Multimeter, Bio-Medical Instrument

Unit	Contents	Lectures
Unit 1	Measurements, Instrument & Calibration:- Basics of Measurements: Accuracy, Precision, resolution, reliability, repeatability, validity, Errors and their analysis, Standards of measurement. Instrument: Static and Dynamic characteristics of instruments, dead zone, hysteresis, threshold, resolution, input & output impedance, loading effects. Calibration of instruments and Standards	10
Unit 2	Transducers and Sensors:- Definition, Classification of Transducers, Selection criterion for Transducers, Detail Study of Transducers: Thermister, RTD, Thermocouple, Strain gauge, LVDT, Capacitive transducer (microphone), Opto-electric transducer - LDR, Photo diode, PIR , Loud speaker, Piezoelectric transducer, Proximity sensor- Inductive, capacitive.	11
Unit 3	Signal Conditioning and Data Acquisition System: Introduction, Sample and Hold circuit, Thermister Wheatstone bridge amplifier, Instrumentation amplifier, Attenuator, Introduction to Data Acquisition System (DAS), Single channel & multi channel DAS. Data logger.	10
Unit 4	Digital Instruments:- Introduction to digital instrument: Advantages of Digital instruments, Digital Tachometer, Digital Capacitance meter, Digital Phase Meter, Digital Frequency Meter. Digital Multi-meter,	06

Section-II: Antenna and Wave Propagation

Course Outcomes: At the end of the course, a student will be able to:

- CO1 : Apply the principles of electromagnetic to explain antenna characteristics such as radiation pattern and directivity.
- CO2 : Understand the structure and working of special antennas such as Dipole antenna, Yagi-Uda antenna and Microstrip patch antennas.
- CO3 : Identify the suitable antenna for a given communication system.
- CO4 : Be familiar with the basic propagations namely ground wave propagation, free space propagation and sky wave propagation.

Unit	Contents	Lectures
Unit 1	Electromagnetic Radiation:- Radiation phenomenon from an oscillation dipole in free space, induction and radiation fields, Retarded potentials, Radiated power and radiation resistance from a short dipole , Theory of point sources, Hertzian dipoles, half-wave dipoles and quarter wave monopole.	08
Unit 2	Antenna Fundamentals and Parameters:- Antenna Definition and Function of antenna. Antenna parameters: Radiation pattern, radiation power density, radiation intensity, directivity, gain, antenna efficiency, half-power beamwidth, bandwidth, polarization, input impedance, radiation efficiency. Current Distribution on a Thin Wire Antenna,	10
Unit 3	Antenna Types: $\lambda/2$ antenna, $\lambda/4$ antenna, antenna arrays, horn antennas, parabolic dish antennas, Helical antenna, Yagi-Uda antenna, Patch antenna, Microstrip antennas.(Structure, Working and Applications) .	10
Unit 4	Radio Wave Propagation Different Modes of Wave Propagation, Structure of atmosphere, Ground wave propagation, effect of Earth's Curvature on Ground wave propagation. Space Wave propagation. Sky Wave Propagation - Introduction, Structure of Ionosphere, Refraction and Reflection of Sky Waves by Ionosphere, Ray Path, Critical Frequency, MUF, Virtual Height and Skip Distance, Relation between MUF and skip Distance, Multi-hop Propagation.	10

Reference Books:

1. Electronic Instruments- K.S. Kalsi (Tata Mc-Graw Hill)
2. Transducers & Instrumentation - by D V S Murty
3. Instrumentation, Measurements and Analysis- B.S. Nakara and VSV Mani (TMH)
4. The Measurement, Instrumentation and Sensors Handbook by John G. Webster
5. Antenna Theory: Analysis and design -C. Balanis ,Wiley India.
6. Antenna Theory and Design, Robert S. Elliott, Wiley-India, 2007
7. Antenna Theory and Design, W. L. Stutzman and G. A. Thiele, 2nd Ed., Wiley, 1997
8. Antenna & Wave Propagation by K.D. Prasad, Satyaprakash Publications.

B. Sc. Part - III CBCS
Semester: V Paper - SEC 3

Renewable energy

Theory: 30 Hours (38 lectures of 48 minutes)

Credits 2

Renewable energy

Course Outcomes: At the end of the course, a student will be able to:

CO1 : To understand the Need, importance and scope of non-conventional and alternate energy resources.

CO2 : To understand role significance of solar energy & Wind Energy.

CO3 : To understand the role of ocean energy in the Energy Generation.

CO4 : To understand the concept of energy Conservation.

Unit	Contents	Lectures
Unit 1	Introduction: Causes of Energy Scarcity, Solution to Energy Scarcity, Factors Affecting Energy Resource Development, Energy Resources and Classification, Renewable Energy - Worldwide Renewable Energy Availability, Renewable Energy in India.	06
Unit 2	Solar energy Solar energy, its importance, storage of solar energy, solar pond, non-convective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems.	10
Unit 3	Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.	06
Unit 4	Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices. Geothermal Energy: Geothermal Resources, Geothermal Technologies. Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of hydro power sources	08
Unit 5	Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect, materials and mathematical description of piezoelectricity, Piezoelectric parameters and modeling piezoelectric generators, Piezoelectric energy harvesting applications, Human power	08

Reference Books:

1. Non-conventional energy sources, B.H. Khan, McGraw Hill
2. Solar energy, Suhas P Sukhative, Tata McGraw - Hill Publishing Company Ltd.
3. Renewable Energy Sources and Emerging Technologies, Kothari et.al., 2nd Edition, PHI Learning.
4. Renewable Energy Technologies: Ramesh & Kumar, Narosa publication.

B. Sc. Part - III CBCS
Semester: VI Paper-VII
Industrial Process Control and PLC Programming and Advanced
Microcontroller and Embedded System (DSE 1005 F1)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits 4

Section - I Industrial Process control and PLC programming

Course Outcomes: At the end of the course, a student will be able to:

- CO1 : Describe typical concepts and components of a Programmable Logic Controller.
- CO2 : Use timer, counter, and other intermediate programming functions.
- CO3 : Design and program basic PLC circuits for entry-level PLC applications.
- CO4 : Explain and apply the concept of electrical ladder logic, its history, and its relationship to programmed PLC instruction.

Unit	Contents	Lectures
Unit 1	Introduction to control system: Significance Transfer Function, Types and order of transfer function (Open loop and Close loop transfer system), Block diagram of Control System and reduction rules, Basic elements of control system, open loop control system, closed loop control system, control system terminology, manually controlled closed loop systems, automatic controlled closed loop systems, comparison closed-loop system and open-loop control, feed-forward control system, adaptive control system, classification of control system. ON-OFF controller, proportional control, PI controller, PD controller and PID control. Introduction to Fuzzy Controller.	10
Unit 2	Components of Control System: Op-amp as a zero crossing detector, non-inverting comparator, inverting comparator, two position control using op-amp, proportional controller, integral controller using Op-amp , derivative controller, PI controller, PID controller.	06
Unit 3	Introduction to PLC : Programmable logic controller (PLC) basics: Definition, overview of PLC systems, block diagram of PLC, input/output modules, power supplies, isolators, features like scan time, system scale, user interface. Modular PLC and Redundant PLC and Applications. Industrial Communication Buses: RS485, Profibus .Distributed control system, DCS components/block diagram, SCADA, adaptive control system.	10
Unit 4	Ladder Programming basics Basic components: fuse, pushbutton, selector switches, limit switches, indicators, relay, timedelay relays functions and symbols. General PLC programming procedures, programming on-off inputs/ outputs. Auxiliary commands and functions: PLC Basic Functions: Register basics, timer functions, counter functions. Ladder Programming: Programs for Boolean logic and flip-flops, counters , timers, flasher. Application program Bottle filling plant, elevator control, washing machine control.	10

Section - II Advanced Microcontroller and Embedded System

Course Outcomes: At the end of the course, a student will be able to:

CO1 : Understand the architecture and function of each pin of AVR 8-bit Microcontroller.

CO2 : Write, debug and simulate embedded C language programs.

CO3 : Understand Timer operation, Interrupt environment and Serial Communication.

CO4 : Understand the interfacing of various systems with AVR microcontroller

Unit	Contents	Lectures
Unit 1	Unit 1: Embedded Systems Design What is embedded system, embedded system basic blocks, embedded system hardware and software, embedded system characteristics, embedded system applications	04
Unit 2	Unit 2: Introduction to AVR microcontroller Overview of AVR family, ATmega8 pin configuration & function of each pin. AVR Microcontroller architecture, status register, Special function registers, SRAM, ROM & EEPROM space, On-Chip peripherals.	06
Unit 3	Unit 3: AVR programming in C AVR Data types, AVR I/O port programming, Timer programming, Input capture and Wave Generator, PWM programming, External Interrupt programming, ADC programming, Serial Port programming.	10
Unit 4	Peripheral interfacing and embedded system Interfacing of Switches, Relays, LEDs, seven segment display 16x2 LCD Interfacing, Stepper interfacing.	07
Unit 5	Designing of an Embedded System DC Motor speed control using PWM technique, Measurement of Temperature of an environment using sensor LM35, Dual channel Digital Voltmeter. (Block diagram, Schematic and Flowchart is only necessary)	09

Reference Books:

1. Control System Engineering- I.J. Nagrath & M. Gopal (New Age International Pub 5th Edit 2006)
2. Feedback Control System Principles And Control System R.A. Barapate (Techmax Pub.)
3. Modern Control Engineering-Katsuhiko Ogata (Prentice Hall, 2010)
4. Computer Based Industrial Control- Krishna Kant (PHI Learning 2004)
5. Programmable Logic Control Programming And Applications - John R. Hackworth
6. Frederic D. Hackworth (Pearson Education India fourth edition 2008)
7. Introduction to Programmable Logic Controller- Gray & Dunning (2nd ed Thomson Edu.).
8. The AVR Microcontroller and Embedded Systems Using Assembly and C, By Muhammad Ali Mazidi, Sarmad Naimi and Sepehr Naimi, Pearson Education.
9. Embedded system design with Atmel AVR microcontroller, by Steven F Barrett, Morgan & Claypool Publishers.
10. Programming and Customizing the AVR Microcontroller, By Dhananjay Gadre, McGraw Hill Education.

B. Sc. Part - III CBCS
Semester: VI Paper- VIII
Power Electronics and FPGA & VHDL Programming (DSE 1005F2)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits 4

Section I -Power Electronics

Course Outcomes: At the end of the course, a student will be able to:

CO1 : Understand the fundamentals of Power semiconductor devices

CO2 : Understand the types, characteristics, and applications of Thyristors

CO3 : Understand and analyse performance of controlled and uncontrolled converters.

CO4 : Familiarize with different applications of Power Electronics.

Unit	Contents	Lectures
Unit 1	<p>Power semiconductor devices: Definition of power electronics, Need for semiconductor power devices, Applications of power electronics, classification of power semiconductor devices, Power diode: structure, operation, conductivity modulation, I-V characteristics, Reverse recovery effect, series and parallel connection of diode, Power transistor: structure, operation, effect of drift layer. Switching characteristics, specifications, Base drive circuits. Power MOSFET : MOSFET structure, characteristics, operation and drive circuits</p>	10
Unit 2	<p>Thyristors Types of Thyristors, Structure of SCR, SCR Characteristics, two transistor analogy - Methods of turning ON and turning OFF, dv/dt and di/dt protection, gate protection circuits Diac and Triac: Basic structure, working and V-I characteristic, application of a Diac as a triggering device for a Triac. IGBT: Structure, characteristics, Operation and drive circuits, Comparison of power transistor, MOSFET and IGBT.</p>	10
Unit 3	<p>Controlled Rectifiers Basics of single and three phase supply phase and line voltage waveforms, SCR as a static switch, phase controlled rectification, single phase half wave, full wave and bridge rectifiers with resistive & inductive loads. (Analysis of all these circuits with resistive load only)</p>	10
Unit 4	<p>Power Systems Power Supplies: Switch mode power supply (DC): flyback, forward, half bridge and full bridge converters. Uninterrupted power supply (UPS), Electronic Ballast, power factor correction.</p>	10

Section - II FPGA and VHDL Programming

Course Outcomes: At the end of the course, a student will be able to:

- CO1 : Understand the fundamentals of programmable logic devices.
- CO2 : Understand the syntax and behaviour of the VHDL language.
- CO3 : Use modern development tools to design complex digital circuits
- CO4 : Simulate and make a synthesis of extensive designs in so called "Field Programmable Gate Array" (FPGA).

Unit	Contents	Lectures
Unit 1	Introduction to Programmable Logic Devices Evolution of Programmable logic devices, PAL, PLA and GAL. CPLD and FPGA architectures. Placement and routing. Logic Cell structure, Programmable interconnects, Logic blocks and I/O Ports. Clock distribution in FPGA	08
Unit 2	Basics of VHDL Introduction: Introduction to Computer-aided design tools for digital systems. Hardware description languages, introduction to VHDL, data objects, classes and data types, operators, overloading, logical operators, Types of delays, Entity and Architecture declaration, Introduction to behavioral, dataflow and structural models.	08
Unit 3	VHDL Programming VHDL statements: Assignment statements, sequential statements and process, conditional statements, case statement, Array and loops, resolution functions, packages and Libraries, concurrent statements. Subprograms: Application of Functions and Procedures, Structural Modelling, Component declaration, structural layout and generics	10
Unit 4	Sequential and Combinational Circuit Design: VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders ,decoders, code converters, comparators, implementation of Boolean functions etc. Sequential Circuits Design: VHDL Models and Simulation of sequential Circuits, Shift Registers, counters etc.	10

Reference Books:

1. Power Electronics - M.H. Rashid (PHI)
2. Power Electronics-P.C. Sen (TMH)
3. Power Electronics Principles and Applications-S. Biswas (Dhanapat Rai Publications)
4. Power Electronics- I by J.S. Katre (Tech-Max)
5. Power Electronics- Dr. P.S. Bhimbhra (Khanna publications)
6. Douglas L. Perry, "VHDL Programming by Example"
7. Lizy Kurien and Charles Roth. Principles of Digital Systems Design and VHDL.Cengage Publishing. ISBN-13: 978-8131505748 .
8. Wayne Wolf. FPGA Based System Design. Pearson Education.

B. Sc. Part - III CBCS
Semester: V Paper- SEC 4
Introduction to Arduino and IoT

Theory: 30 Hours (38 lectures of 48 minutes)

Credits 2

Introduction to Arduino and IoT

Course Outcomes: At the end of the course, a student will be able to:

- CO1 : Students will be familiarizing with Arduino Board & Accessories.
 CO2 : Students will be familiarizing with interfacing with display devices and sensors.
 CO3 : Students will be able design some IoT based prototypes
 CO4 : Understand the physical and logical design on IoT.

Unit	Contents	Lectures
1	Introduction to Arduino Board & Accessories The Arduino Platform, Block diagram, Architecture, Pin functions, overview of main features such as I/O Ports, Timers, interrupts serial port, PWM, ADC, etc..	08
2	Display Interfacing: Interfacing arduino to LED's- blinking single LED, blinking multiple LED's, 7 segment display , traffic light ,LED flashes ,LED dot matrix . Interfacing to LCD's- Basic LCD control, display a message on LCD screen.	10
3	Interfacing sensors: Sensors- Definition, Types. Interfacing arduino to different sensors- light sensor, temperature sensor, humidity sensor, pressure sensor sound sensor, distance ranging sensor, water/detector sensor, smoke, gas, alcohol sensor, ultrasonic range finder.	10
4	Introduction to IoT: Networking basics, Communication Protocols, Sensor Networks, Machine-to-Machine Communications, IoT Definition, Characteristics. IoT Functional Blocks, Physical design of IoT, Logical design of IoT, Communication models & APIs.	10

Reference Books

1. Beginning Arduino, Michal Mc Roberts, Second Edition
2. Massimo Banzi, "Getting started with Arduino" 2nd Edition, Orelly 2011.
3. The internet of things - Sean Dodson and Rob van Kranenburg, 2009

B.Sc. Part - III CBCS
Semester - V & VI
ELECTRONICS LAB

Credits: 08

GROUP A : (LIC & PLC) (minimum 08)

1. Instrumentation amplifier using OPAMP
2. Precision rectifier using OPAMP
3. Log amplifier using OPAMP
4. Study of active filter : Low and High pass
5. Study of active filter : band pass
6. Study of V to F and F to V using PLL.
7. Study of PLC Simulator (TriLOGI Software)/ codesys-software/ hardware and implementing Boolean function.
8. Programming with PLC (TriLOGI Software)/ codesys-software/ hardware) for sequential logic RS -FF,JK-FF,T-FF,D-FF
9. Study of PLC timers and counters in PLC ((TriLOGI Software)/ codesys-software/ hardware)

GROUP B: (Antenna and Power Electronics) (minimum 08).

1. Study of simple dipole $\lambda/2$ antenna
2. Study of folded dipole $\lambda/2$ antenna
3. Study of simple dipole $\lambda/4$ antenna
4. Study of Yagi-Uda with 3 and 5 element simple dipole antenna
5. Study of SCR characteristics (static)
6. Study of AC / DC Timer
7. SCR firing by UJT
8. AC Voltage controller
9. Speed Control of DC Motor.
10. Study of ON/OFF Temperature controller (LM34/LM35/AD590)
11. Phase Shift control of SCR
12. Study of Introduction to MATLAB/Scilab
13. To study the simulation of single phase half wave controlled rectifier with R & RL-load using MATLAB - simulink/Scilab
14. To study the simulation of single phase half controlled bridge rectifier with R using MATLAB - simulink/Scilab
15. Amplitude Modulation-Modulation & Demodulation using MATLAB & Simulink/Scilab
16. Sampling Theorem using MATLAB & Simulink/Scilab

GROUP C: (Microcontroller 8051 & FPGA)*(minimum 08).*

1. Arithmetic and logical operations using 8051 microcontroller.
2. Switch and Relay interfacing to 8051 microcontroller.
3. DC motor interfacing to 8051 microcontroller.
4. Study of Timers in 8051 Microcontrollers.
5. Stepper Motor interfacing to 8051 microcontroller.
6. DAC0808 interfacing to 8051 microcontroller.
7. ADC0804 interfacing to 8051 microcontroller.
8. Serial communication with PC using 8051 microcontroller.
9. Write VHDL code to realize basic and derived logic gates.
10. Write VHDL code to realize Half adder, Full Adder using basic and derived gates.
11. Write VHDL code to realize Half subtractor and Full Subtractor using basic and derived gates.
12. Design and simulation of a 4 bit Adder using VHDL.
13. Write VHDL code to realize Multiplexer (4x1) and Demultiplexer(1x4) using logic gates.
14. Write VHDL code to realize Decoder and Encoder using logic gates.
15. Write VHDL code to realize Clocked D, JK and T Flip flops (with Reset inputs)
16. Write VHDL code to realize 3-bit Ripple counter

GROUP D: (AVR and Instrumentation)*(minimum 08).*

1. Interfacing of Switches and LED with Arduino/AVR microcontroller.
2. LCD Interfacing with Arduino/AVR microcontroller.
3. Stepper Motor Interfacing with Arduino/AVR microcontroller.
4. Interface temperature sensor LM35 with Arduino board and display temperature on LCD.
5. Interface temperature sensor Humidity Sensor (DHT11) with Arduino/AVR board and display temperature and humidity values on LCD.
6. Accelerometer Sensor Interfacing with Arduino/AVR microcontroller.
7. Study of temperature sensor RTD and Thermistor
8. Function generator using IC 8038
9. Automatic Porch light control using LDR and relay.
10. Study of the characteristics of Resistance Temperature Detector (RTD)
11. To study transducer (Thermistor/ Thermocouple) and plot necessary graph.

Distribution of Marks for Practical Exam (LAB):

Group	A	B	C	D	Project	Journal	Industrial Visit	Seminar	Total
Marks	35	35	35	35	40	08	04	08	200

Evaluation Pattern

Scheme of Marking (Theory)

Semester	Course Codes	End Semester Examination Marks	CIE/Internal assessment Marks and Pattern	Practical Examination Marks	Total Marks
V	DSE-1005E1-Section-I	40	10 (Test)		50
	DSE-1005E1-Section-II	40	10 (Test)		50
	DSE-1005E2-Section-I	40	10 (Test)		50
	DSE-1005E2-Section-II	40	10 (Test)		50
VI	DSE-1005F1-Section-I	40	10 (Test)		50
	DSE-1005F1-Section-II	40	10 (Test)		50
	DSE-1005F2-Section-I	40	10 (Test)		50
	DSE-1005F2-Section-II	40	10 (Test)		50
	DSE-1005E1, 1005E2, 1005F1, and DSE-1005DF2			200 (Annually)	200
	SEC 3 & SEC 4			50 (Annually)	50

Distribution of Marks for Practical Examination (LAB): Total Marks: 200

Exam. types	Experiment Groups				Project			Journal	Industrial Visit/Study Tour	Seminar	Total
	A	B	C	D	Circuit Built	Report	Vivo				
Max. Marks	35	35	35	35	20	10	10	08	04	08	200

Nature of Question Paper

Vivekanand College, Kolhapur (Autonomous)

B.Sc. Part - III Electronics Semester V Examination _____

Course Code and Name: DSE 1005E1: Linear Integrated Circuits

Day:

Time:

Date:

Total Marks: 40

Instructions: 1) All the questions are compulsory.

2). Figures to the right indicate full marks.

3) Draw neat labeled diagrams wherever necessary.

Section-I

Q.1) Select correct Alternatives from the following (08)

- i) -----
a) b) c) d)
- ii) -----
a) b) c) d)
- iii) -----
a) b) c) d)
- iv) -----
a) b) c) d)
- v) -----
a) b) c) d)
- vi) -----
a) b) c) d)
- vii) -----
a) b) c) d)
- viii) -----
a) b) c) d)

Q.2) Attempt Any Two (16)

- i) -----
- ii) -----
- iii) -----

Q.3) Attempt Any Four (16)

- i) -----
- ii) -----
- iii) -----
- iv) -----
- v) -----
- vi) -----

“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)**



DEPARTMENT OF BOTANY

**B.Sc. Part - III
Semester-V & VI**

SYLLABUS

Under Choice Based Credit System

to be implemented from Academic Year 2020-21

**B. Sc. Botany Part - III CBCS
Semester - V Paper- V**

Title of Course: "Cytology and Research Techniques in Life Sciences & Microbiology, Plant Pathology and Biofertilizer"

(DSC 1007 E1)

Hour : 30

Credits - 02

Section - I : Cytology and Research Techniques in Life Sciences

Course Outcomes: After the completion of the course the student will be able to -

CO1: Know the details of microscopy-principles of light microscopy, Electron microscopy (TEM&SEM), fluorescence microscopy.

CO 2: Perform chromatography technique.

CO 3: Know the details of micrometry, microphotography and electrophoresis.

CO 4: Know the radioactive isotopes and its importance.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Cell as a unit of Life 1a:The cell theory, Prokaryotic and Eukaryotic cells, Cell size and shape. 1b:Cell Membrane and cell wall 1c: The functions of membranes, Models of membrane structure. 1d: The fluidity of membranes, Membrane proteins and their functions,faces of the Membranes, selective permeability of the membrane cell wall.	10	
Module 2	Cell Organelles 2a: Glyoxisomes, Peroxisomes and Lysosomes - Structure, compositionand functions. 2b: Cell cycle2c: Apoptosis.	08	
Module 3	Analytical Techniques in Plant Sciences. 3a:Principles of Microscopy- Light Microscope, Fluorescence Microscopy, Electron Microscopy (TEM and SEM) 3b:Chromatography: Principles-Paper chromatography, TLC 3c:Micrometry, Microphotography, Electrophoresis	09	
Module 4	Radiation Biology 4a:RadioactiveIsotopes 4b: Effect of Radiations on Biological Systems.	09	

	4c: Beneficial Effect of Radiations. 4d: Autoradiography Technique 4e: Geiger-Muller Experiment / Liquid Scintillation Counter 4f: Precautionary measures		
--	--	--	--

Reference Books:

1. Bajpai, P. K. Biological instrumentation and methodology. S.Chand and Co.Ltd, New Delhi.
2. Cotteril, R.(2002). Biophysics: An Introduction, John Wiley and sons.
3. Debajyoti Das. Biophysics and biophysical Chemistry. Academic Publishers, Kolkatta.
4. Dwivedi J.N., Singh, R.B.(1990).Essentials of plant Techniques. Scientific Publisher, Jodhpur.
5. Ruzin, S. E.(1999). Plant Microtechnique and Microscopy. Oxford University Press, New York, U.S.A

B. Sc. Botany Part - III CBCS

Semester - V Paper- V

Title of Course: "Cytology and Research Techniques in Life Sciences & Microbiology, Plant Pathology and Biofertilizer"

(DSC 1007 E1)

Hour : 30

Credits - 02

Section - II : Microbiology, Plant Pathology and Biofertilizer

Course Outcomes: After the completion of the course the student will be able to -

CO 1: Know the microorganisms in biological world.

CO 2: Become aware of applications of different microbes in various industries.

CO 3: Know the potential of these studies to become an entrepreneur.

CO 4: Equip themselves with skills related to laboratory as well as industries based studies.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Microbiology 1a:Methods in Microbiology 1b:Micro-organisms in Biological world 1c:Scope of Microbes in Industry and Environment	08	
Module 2	Plant Pathology 2a:Classification of plant diseases based on Pathogens, Crops and Symptoms. 2b:Study of Mechanism of Infection in Disease development(Biochemical changes),prevention and control of Plant Diseases. Role of Quarantine, Significance of Plant Pathology.	09	
Module 3	Study of Plant Diseases 3a: Cereals - Rust of Wheat 3b: Cash crop - Red Rot of Sugarcane 3c: Legume - Rust of Soybean, Mosaic of Bean 3d: Spices - Leaf spot of Turmeric 3e: Vegetable - White Rust of <i>Amaranthus</i> 3f: Fruit - Leaf curl of Papaya	09	
Module 4	Bio fertilizer 4a: Microbes in Agriculture - Biological Nitrogen Fixation, <i>Mycorrhizae</i> . 4b:Organic Farming-Introduction, Concept and scope of Organic farming, Green Manuring , Bio compost Making Method	04	

Reference Books:

1. Agrios G. N.(1997).Plant pathology. Academic Press, London.
2. Prescott L. M, Harley J. P.,Klein D. A.(2005).Microbiology, 6thEdition,McGraw Hill, India.
3. Peleazor M. J.and Chan E.C.S.(1972)Laboratory Exercies in Microbiology Mcgraw Hill Book co.
4. Rangaswami G.and Mahadevan A.(1999) .Diseases of crop plants in India. Prentice Hall. 4th ed. New Delhi..
5. Sharma P.D.(2011). Plant pathology, Rastogi publication, Merrut, India.

**B. Sc. Botany Part - III CBCS
Semester - V Paper- VI**

Title of Course: **“Biochemistry and Stress Physiology & Plants
Systematics and Pale botany”
(DSC 1007 E2)**

Hour : 30

Credits - 02

Section - I : Biochemistry and Stress Physiology

Course Outcomes: After the completion of the course the student will be able to –

CO 1: Understand the properties and classification of carbohydrates and proteins.

CO 2: Understand the Beta oxidation, Gluconeogenesis and its role immobilization of fatty acids during germination.

CO 3: Understand the different types of plant stresses.

CO 4: Know the mechanism of senescence and aging in plants.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	<p>Plant Biochemistry. Carbohydrate metabolism. 1a: Introduction and classification of Carbohydrates 1b: Properties of Monosaccharides, Oligosaccharides, Polysaccharides. 1c: Significance Protein metabolism. 1d: Introduction, properties and characters of aminoacids 1e: Protein-structure and classification 1f: Protein synthesis</p>	12	
Module 2	<p>Lipid metabolism and Fattyacid metabolism. 2a: Introduction and classification of lipids. 2b: Properties of fattyacids (Stearic and Palmatic acid), and unsaturated fatty acids(Linoleic and Linolenic acid) 2c: Beta oxidation. 2d: Gluconeogenesis and role in mobilization of fatty acids during germination. 2e: Significance of lipids.</p>	12	
Module 3	<p>Stress physiology. 3a: Defining Plant stress. 3b: Types of stress:-Water stress-Salinity stresses, High light stress, Temperature stress. 3c. Stress sensing mechanisms in plants, Calcium modulation, Phospho lipid signaling.</p>	08	
Module 4	<p>Senescence and Aging. 4a: Patterns of senescence. 4b: Physical changes during</p>	04	

	senescence. 4c: Control of senescence.		
--	---	--	--

Reference Books:

1. Buchanan B.B, Grussem W. and Jones R. L. (2000). Biochemistry and Molecular Biology of Plants. American society of Plant Physiologists, Maryland and USA.
2. Dryer R. L. and Lata G.F.(1989). Experimental Biochemistry, Oxford University Press, New York.
3. Lea P. J. and Leegood R.C. (1999). Plant Biochemistry and Molecular Biology (2nd Edition). John Wiley and Sons. Chichester, England.
4. Malik and Shrivastava- Plant Physiology, S.Chand and Co., New Delhi.
5. Varma V.– A text book of Plant Physiology, S.Chand and Co., New Delhi.

**B. Sc. Botany Part - III CBCS
Semester - V Paper- VI**

**Title of Course: "Biochemistry and Stress Physiology & Plants
Systematics and Pale botany"
(DSC 1007 E2)**

Hour : 30

Credits - 02

Section - II : Plants Systematics and Pale botany

Course Outcomes: **After the completion of the course the student will be able to -**

CO 1: Know the concept of systematics.

CO 2: Know the phylogeny of angiosperms, a general account of origin of Angiosperms.

CO 3: Trace the history of development of systems of classification, emphasizing angiospermic taxa.

CO 4: Know the wide verities of angiosperm and trades in classification.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Importance of Plant Systematics. 1a:Introduction to Systematics, Evidences From Palenology, Cytology, Phytochemistry and Molecular data. 1b:Field inventory, Functions of Herbarium, Important Herbaria and Botanical gardens of the World and India.	12	
Module 2	System of Classification. 2a:Phylogeny of Angiosperms,The general account of origin of Aniosperms (withr eference to Gnetalean theory) 2b:Classificationsy stem of Takhtajan, Brief reference of Angiosperm Phylogeny Group (APG-III) classification(2009). 2c: Ranks of IUCN and methods of Conservation.	08	
Module 3	PlantFamilies. 3a:Morphological and floral characters, distinguishing characters and economic importance of following families. 3b:Anacardiaceae, Fabaceae, Apiaceae, Rubiaceae, Acanthaceae, Euphorbiaceae, Poaceae	08	
Module 4	Paleobotany. 4a:General account types of fossils, Geological time scale. 4b:Study of following form genera with reference to systematic position, external morphology and affinities - <i>Lyginopteris</i> and <i>Enigmocarpon</i> 4c:Applications of Paleobotany-Role of microfossils in oil and coal exploration.	08	

Reference Books:

1. Davis P.H. and Haywood V. H.1963.Principles of angiosperm anatomy. Oliver and Royd, London.
2. Heywood, V. H.and Moore, D.M 1984.Current concepts in plant taxonomy. Academic Press, London.
3. Lawrence G. H. M.1951.Taxonomy of vascular plants. MacMillan, NewYork.
4. Naik, V.N.1984.Taxonomy of angiosperms.Tata Mc Graw Hill, NewYork.
5. Sporne K.R.1977. The morphology of Angiosperms. B. I. Publication, Bombay.

B. Sc. Botany Part - III CBCS
Semester - V SEC (E)
Title of Course: "Technique of Life Science"

Course Outcomes: On completion of the course, students will be able to:

CO 1: Familiar with various instrument & techniques used in labs.

CO 2: Familiar with different plant diseases & their management.

CO 3: Get to know the plant products used in agriculture and organic farming.

CO 4: Learn plant biochemistry.

Syllabus:

1. Study of Micrometry technique.
2. Study of the photo micrographs of cell organelle.
3. Cytological techniques-preparation of fixatives, preparation of stains (Acetocarmine and Acetoorcein)
4. To study the different types of microscope and its parts.
5. Study of Plant diseases as per theory
 - a) Rust of Wheat b) Red rot of Sugarcane c) Rust of Soybean d) Mosaic of Bean
6. Preparation of PDA (slants and plates) and Sterilization.
7. Study of fermentation by yeast.
8. Study of organic products- Jeevamruth, Dashparniark
9. To study various tools and instruments required in the lab-Autoclave, Laminarflow, Incubator, Waterbath, P^h meter, Oven.
10. Qualitative test for sugar, starch and cellulose in plant material. (Any two test for each)
11. Qualitative test for proteins and lipids in plant material.(Any two test for each)
12. Separation of amino acid by circular paper chromatography.
13. Estimation of chlorophyll in leaf issue.
14. Comparative study of chlorophyll content in healthy and senescence leaf.
15. 15) Study the pathway of phospholipid signaling and calcium modulation by photographs.

References:

- 1) Bajpai, P. K. Biological instrumentation and methodology S. Chand and Co.Ltd.
- 2) Pelezor M. J. and Chan E.C.S.)Laboratory Exercies in Microbiology, Mcgraw Hill Book co.
- 3) Sathe T. V. .Vermiculture and organic farming, Daya Publications.
- 4) Vayas S.C. and Vaya S.S and Modi H.A.(1998) -Biofertilizers and organic farming, Akta Prakashan Nadiad.

**B. Sc. Botany Part - III CBCS
Semester - VI Paper- VII**

Title of Course: **“Genetics and Plant Breeding & Biostatistics, Economic Botany and Ethno botany”**

(DSC 1007 F1)

Hour : 30

Credits - 02

Section - I : Genetics and Plant Breeding

Course Outcomes: After the completion of the course the student will be able to –

CO 1: Know the Mendelian genetics and basic laws of inheritance.

CO 2: Know the phenomenon of dominance, laws of segregation, and independent assortments of genes.

CO 3: Understand the phenomenon of linkage and crossing over.

CO 4: Know the genomic organization in plants.

CO 5: Understand the different techniques of plant breeding.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Heredity 1a: Introduction, Terminologies, Laws of Inheritance (Monohybrid and Dihybrid) 1b: Multiple Allelism.	09	
Module 2	Linkage and Crossing over 2a: Linkage- Concept and History, Types of Linkage 2b: Crossingover- Concept and Significance, Cytological proof crossing over. 2c: Linkage Maps	08	
Module 3	Extra-Chromosomal Genome 3a: Introduction and Organization of genome 3b: Plastid Inheritance 3c: Mitochondrial Inheritance	06	
Module 4	Plant Breeding 4a: Introduction and objectives, Plant genetic resources, Centers of origin and Domestication of crop plants. 4b: Methods of crop improvements. Methods of Breeding, Selection methods for self-pollinated, cross pollinated and vegetative propagated plants. Mutation breeding	13	

Reference Books:

1. Acquah, G. (2007). Principles of Plant Genetics and Breeding. Black well Publishing.
2. Chaudhari, H.K.(1984). Elementary Principles of Plant Breeding. Oxford IBH. 2nd edition.,
3. Gardner E.J., Simmons M.J. and Snustad D.P.(2008). Principles of Genetics. 8th Ed. Wiley, India.
4. Snustad, D. P. and Simmons, M. J.(2010). Principles of Genetics. John Wiley and Sons nc., India 5th Edition.
5. Singh, B.D. (2005). Plant Breeding: Principle sand Methods. Kalyani Publishers, 7th Edition. Lucknow.

**B. Sc. Botany Part - III CBCS
Semester - VI Paper- VII**

Title of Course: **“Genetics and Plant Breeding & Biostatistics, Economic Botany and Ethno botany”**

(DSC 1007 F1)

Hour : 30

Credits - 02

Section - II : Biostatistics, Economic Botany and Ethno botany

Course Outcomes: After the completion of the course the student will be able to –

CO 1: Know the biostatistics and statistical terms.

CO 2: Know the method of sampling and representation of data.

CO 3: The role of plants in human welfare.

CO 4: Gain the knowledge about various plants of economic use and importance of plant and plant products.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Biostatistics 1a:Introduction, Statistical Terms. 1b:Sampling-Sampling Methods. 1c:Collection and Representation of data (Diagrammatic and Graphic representation) 1d:Measures of Central Tendency -Mean, Mode and Median 1e:Variances and standard deviation, Coefficient of variation. 1f:Test of Significance(T- test),Chi-square test (X ² test)	10	
Module 2	Economic Botany-I 2a:Study of following economical important plant with reference to origin, morphology, parts used and uses. 2b:Cereals- Jowar and Rice 2c:Legumes- Soybean and <i>Vigna</i> 2d:Vegetables- <i>Amaranthus</i> / Chilly 2e:Spices-Clove and blackpepper	09	
Module 3	Economic Botany- II 3a:Beverages-Tea and Coffee 3b:Fiber Yielding Plants-Cotton and <i>Hibiscus cannabinis</i> 3c:Oil yielding <i>Pongamia pinnata</i> and Sunflower 3d:Dye : <i>Bixa</i> and <i>Lawsonia</i>	08	
Module 4	Ethnobotany 4a: Introduction, Concept and Scope 4b: Ethnobotanical studies with reference to data collection- Field work, Herbarium, Ancient literature, Archaeological	09	

	findings, Sacred groves. 4c: Role of ethnobotany in modern medicine- <i>Adathoda vasica</i> , <i>Tinospora cordifolia</i> , <i>Curcuma longa</i> and <i>Tribulus terrestris</i>		
--	---	--	--

Reference Books:

1. Chrispeels, M. J. and Sadava, D. E.(1994). Plants, Genes and Agriculture. Jones and Bartlett Publishers.
2. Gupta, P .K.(1994).Genetics. Rastogi Publications, Shivaji Road, Meerut.
3. Klug, W. S., Cummings, M. R., Spencer, C.A.(2009). Concepts of Genetics. Benjamin Cummings, USA. 9thEd.
4. Sharma ,J. R.(1994).Principles and Practice of Plant Breeding.Tata McGraw Hill Publishing Co.Ltd, New Delhi.

B. Sc. Botany Part - III CBCS
Semester - VI Paper- VIII
Title of Course: "Molecular Biology and Biotechnology & Horticulture, Forestry and Herbal Technology"
(DSC 1007 F2)

Hour : 30

Credits - 02

Section - I : Molecular Biology and Biotechnology

Course Outcomes: After the completion of the course the student will be able to –

CO 1: Know the scope and importance of molecular biology.

CO 2: Gain knowledge about the mechanism and essential component required for the DNA replication.

CO 3: Know the fundamentals of Recombinant DNA technology.

CO 4: Gain the knowledge of genetic engineering.

CO 5: Know the principles and basic protocols of plant tissue culture.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Genetic Material 1a:NucleicAcids(DNA, RNA) 1b:Griffth'sandAvery'strans formation experiment, Harshey-Chase bacteriophage experiment 1c:DNAstructure and Types of DNA 1d:DNA replication 1e:Types of RNA	06	
Module 2	Recombinant DNA Technology 2a:Introduction and Principle 2b:Enzymes involved in recombinant DNA technology 2c:Cloning Vectors (Plasmid, Bacteriophage and Cosmids) 2d:Gene Amplification: PCR techniques	08	
Module 3	Genetic Engineering 3a:Introduction 3b:Methodofgenetransfer- <i>Agrobacterium</i> mediated, Directgene transfer by Electroporation, Microinjection, Microprojectile bambardment 3c:Transgenic Plants (<i>Bt</i> Cotton and Golden Rice) 3d:Applications of Genetic transformation 3e:BlottingTechniques-Northern, Southern and DNA Fingerprinting	08	
Module 4	Plant Tissue Culture 4a:Principle and Totipotency 4b:Components of culture media, Sterilization techniques 4c:Techniques inTissue culture (Callus culture and Cell suspension) 4d:Organogenesis, Embryogenesis 4e:Anther culture 4f:Applications of Plant Tissue Culture	08	

Reference Books:

1. Bhojwani S.S and Razdan M.K.(1996). Plant Tissue Culture.Theory and Practice. Elsevir Science Amsterdam. The Netherlands.
2. Glick B. R; Pasternak J.J.(2003).Molecular Biotechnology-Principles and Applications of Recombinant DNA,ASM Press,Washington.
3. Rusell,P. J.(2010). Genetics- A Molecular Approach. Benjamin Cummings, U.S.A.3rdedition.
4. Snustad D. P.and Simmons M.J.(2010).Principles of Genetics. John Wiley and Sons Inc.,U.S.A 5thedition.
5. Watson J. D; Baker T. A; Bell S.P;Gann A; Levine M; Losick R.(2007) Molecular Biology of the gene,Pearson Benjamin Cummings, CSHL Press, New York, U.S.A.

B. Sc. Botany Part - III CBCS
Semester - VI Paper- VIII
Title of Course: "Molecular Biology and Biotechnology & Horticulture, Forestry and Herbal Technology"
(DSC 1007 F2)

Hour : 30

Credits - 02

Section - II : Horticulture, Forestry and Herbal Technology

Course Outcomes: After the completion of the course the student will be able to -

CO 1: Know the science of horticulture and methods of propagation of horticultural plants.

CO 2: Know how to manage a good nursery.

CO 3: Gain the basic knowledge of forestry and its products.

CO 4: Know different methods of herbal technology.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Horticulture 1a: Introduction and importance 1b: Methods of Propagation and Asexual and Sexual 1c: Plant Nursery – Introduction, Types of Nursery Infrastructure and requirement Use of Fertilizers and Pesticides Commercial importance	08	
Module 2	Gardening and Ornamental Plants 2a: Gardening- Definition, Objective, Types of Gardening, Importance and Landscape garden 2b: Ornamental Plants: Herbs, Shrubs, Trees, Indoor plants, Lawn and Climber	08	
Module 3	Forestry 3a: Introduction, Forest types of India 3b: Wild life and Biosphere reserves 3c: Social and Agricultural Forestry 3d: Forest research education and Training institutions 3e: Forest Acts 3f: Different Plant as a forest products.	08	
Module 4	Herbal Technology 4a: Pharmacognosy- Definition and Techniques 4b: Phytochemicals – Alkaloids and Phenols 4c: Drug- types and adulteration 4d: Scope of Pharmacognosy	06	

Reference Books:

1. Bose T.K and Mukherjee D, Gardening in India, Oxford and IBH Publishing Co, New Delhi
2. Kumar N., Introduction to Horticulture, Rajalakshmi Publications. Nagercoil.
3. Edmond Musser and Andres, Fundamentals of Horticulture. Mc Graw Hill Book Co, New Delhi.
4. Chopra R.N, Nayar S. L. and Chopra C., Glossary of Indian Medicinal Plants, C.S.I.R, New Delhi.

B. Sc. Botany Part - III CBCS
Semester - V SEC (E)
Title of Course: "Techniques in Plant Diversity and Crop Improvement"

Course Outcomes: On completion of the course, students will be able to:

CO 1: Familiar with identification, classification & nomenclature of plants.

CO 2: Familiar with conservation of useful & endangered plants.

CO 3: Learn breeding techniques for improvement of crop diseases.

CO 4: Get employment opportunities to studying different horticultural technique.

Syllabus:

1. Study of Micrometry technique.
2. Identification of genus and species with the help of Cook's Flora.
3. Study of pollen viability and pollen germination.
4. Study of herbarium technique.
5. Method of emasculation and bagging(demonstration only)
6. Study of breeding technique in suitable material(Malvaceae/ Fabaceae/Poaceae)
7. Common plants use for ethno botanical purpose by Tribals.
8. Economic botany: a)Cereals, Legumes,Vegetables, b)Spices, Beverages, Dye c)Fiber and oil yielding plants
9. Ethnic food crops
10. Ethnoveterinary medicine.
11. Study of implements used in Nursery and gardening.
12. Propagation by layering/ Grafting.
13. Identification and description of Herbs(Annuals),Perennials(Shrubs,Trees).
14. Identification and description of climbers, creepers, indoor plants andl awns.
15. Study of forest products.
16. Study of Biodiversity ,composition of different types of forests in India
(Tropical, Subtropical and Temperate).

References:

1. Bose T. K and Mukherjee D, Gardening in India, Oxford and IBH Publishing Co, New Delhi.
2. Capon B., Botany for Gardeners. 3rdEdition. Timber Press Portl and, Oregon.
3. Sporne K. R. The morphology of Angiosperms. B. I. Publication, Bombay.
4. Kumar N., Introduction to Horticulture, Rajalakshmi Publications. Nagercoil.
5. Randhawa G. S. and Mukhopadhyay A., Horticulture in India, Allied Publishers, New Delhi.

B. Sc. Part – III CBCS
Semester – V & VI
Based on Section I and Section II of DSE E1
Botany LAB (II) : Course Code (Practical)
Name of the Practical Course
Hours- 60 (... lectures of ... minutes)- Credits-02

Practical I:

- 1) Study of Micrometry technique.
- 2) To study of prokaryotic cell (Bacteria), viruses, eukaryotic cell with the help of electron micrograph.
- 3) Study of the photomicrographs of cell organelle.
- 4) Study of special chromosome (Polytene and Lampbrush) either by slides or photographs.
- 5) Separation and identification of amino acid by TLC.
- 6) Onion peel to study the plant cell.
- 7) Cytological techniques - preparation of fixatives, preparation of stains (Acetocarmine and Acetoorcein)
- 8) To study the different types of microscope and its parts.
- 9) To study principles and applications of Spectrophotometer, Calorimeter, Electrophoresis, Liquid Scintillation counting.
- 10-12) Study of Plant diseases as per theory
 - a) Rust of Wheat b) Red rot of Sugarcane c) Rust of Soybean
 - d) Wilt of Gram e) Leaf spot of Turmeric / Leaf spot of Peeper
 - f) White rust of *Amaranthus* g) Leaf curl of Papaya
- 13) Preparation of PDA (slants and plates) and Sterilization.
- 14) Inoculation of Fungi on slants and plates.
- 15) Isolation and separation of soil fungi by dilution method.
- 16) Study of fermentation by yeast.
- 17) Staining technique - Gram's staining.
- 18) Study of important stains of microbiology.
- 19) Study of typical virus (Plant virus, Bacteriophage) by using photograph.
- 20) Study of Bio fertilizers - *Nostoc*, *Trichoderma*, *Anabaena*, *Rhizobium*, VAM.
- 21) Study of organic products- Jeevamruth, Dashparniark

Reference Books:

1. Bajpai, P. K. Biological instrumentation and methodology S. Chand and Co.Ltd.
2. Pelezor M. J. and Chan E.C.S.) Laboratory Exercies in Microbiology, Mcgraw Hill Book co.
3. Sathe T. V. .Vermiculture and organic farming, Daya Publications.
4. Vayas S.C. and Vaya S.S and Modi H.A.(1998) -Biofertilizers and organic farming, Akta Prakashan Nadiad.

B. Sc. Part - III CBCS
Semester - V & VI
Based on Section I and Section II of DSC E2
Botany LAB (II) : Course Code (Practical)
Name of the Practical Course
Hours- 60 (... lectures of ... minutes)- Credits-02

Practical II:

- 1) Qualitative test for sugar, starch and cellulose in plant material. (Any two test for each)
- 2) Qualitative test for proteins and lipids in plant material. (Any two test for each)
- 3) Determination of fatty acid value of oil sample.
- 4) Estimation of proteins from plant samples by biuret method
- 5) Separation of amino acid by circular paper chromatography.
- 6) Estimation of chlorophyll in leaf tissue.
- 7) Comparative phytochemical studies in healthy and stressed plants.
- 8) Comparative study of chlorophyll content in healthy and senescence leaf.
- 9) Study the pathway of phospholipid signaling and calcium modulation by photographs.
- 10) to 16. Study of following plant families.
 - a. Anacardiaceae b) Fabaceae c) Apiaceae d) Rubiaceae
 - e) Acanthaceae e) Euphorbiaceae f) Poaceae
- 17) Study of types of fossils :Impression, Compression, Pterification, Cast, Coalball, Amber.
- 18) Study of fossil genera- *Enigmocarpon*, *Lyginopteris*
- 19) Identification of genus and species with the help of Cook's Flora.
- 20) Study of pollen viability and pollen germination
- 21) Study of herbarium technique.

Reference Books:

1. Bajpai, P. K. Biological instrumentation and methodology S. Chand and Co.Ltd.
2. Pelezor M. J. and Chan E.C.S.)Laboratory Exercies in Microbiology, Mcgraw Hill Book co.
3. Sathe T. V. .Vermiculture and organic farming, Daya Publications.
4. Vayas S.C. and Vaya S.S and Modi H.A.(1998) -Biofertilizers and organic farming, Akta Prakashan Nadiad.

B. Sc. Part - III CBCS
Semester - V & VI
Based on Section I and Section II of DSE F1
Botany LAB (II) : Course Code (Practical)
Name of the Practical Course
Hours- 60 (... lectures of ... minutes)- Credits-02

Practical III:

- 1) Genetic examples- Mendalian Laws.
- 2) Genetic examples- linkage and cross-over.
- 3) Genetic examples- Polygen inheritance.
- 4) Study of meiosis in Allium and prepatation of permanat cyctogical slide.
- 5) Preparation of karyotypes- Preparation of ideogram by using photogrphe.
- 6) Study of various stages of mitosis in root tip cells.
- 7) Genetic examples on multiple alleles.
- 8) Camera Lusida drawing.
- 9) Method of emasculation and bagging (demonstration only)
- 10) Measure of central tendency of giving data.
- 11) Analysis of the giving data using computer/ study of frequency distribution and its graphicspresentation.
- 12) Common plant use for ethanobotanical purpose by Tribals.
- 13) Documentation technique of Ethenobotany.
- 14)to 19) Economic botany. a) Cereals, Legumes, Vegetables b) Spices, Beverages, Dye
- 20) Fiber and oil yielding plants
- 21)Ethnic food crops
- 22) Ethno veterinary medicine.

Reference Books:

1. Chrispeels, M. J. and Sadava, D. E.(1994). Plants,Genes and Agriculture. Jones and Bartlett Publishers.
2. Gupta, P .K.(1994).Genetics. Rastogi Publications, Shivaji Road, Meerut.
3. Klug, W. S., Cummings, M. R., Spencer, C.A.(2009). Concepts of Genetics. Benjamin Cummings, USA. 9thEd.
4. Sharma ,J. R.(1994).Principles and Practice of Plant Breeding.Tata McGraw Hill Publishing Co.Ltd, New Delhi.

B. Sc. Part - III CBCS
Semester - V & VI
Based on Sec I and Sec II of DSC F2
Botany LAB (II) : Course Code (Practical)
Name of the Practical Course
Hours- 60 (... lectures of ... minutes)- Credits-02

Practical IV:

- 1) Familiarization with basic equipment's in tissue culture.
- 2) Preparation of tissue culture medium (MS) and its sterilization.
- 3) to 5) Demonstration techniques of in vitro sterilization and inoculation methods using suitable explants.
- 6) Study of methods of gene transfer through photographs.
- 7) Study of steps of genetic engineering for the production of Bt cotton, Golden rice through photographs.
- 8) Study of molecular techniques - PCR, Blotting techniques.
- 9) Study through photographs - anther culture, somatic embryogenesis, endosperm and embryoculture, micropropagation.
- 10) Study of implements used in Nursery and gardening.
- 11) Propagation by layering.
- 12) to 13) Propagation by grafting
- 14) Identification and description of Herbs (Annuals), Perennials (Shrubs, Trees).
- 15) Identification and description of climbers, creepers, indoor plants and lawns.
- 16) Study of forest products.
- 17) Chemical tests for Tannin (*Terminalia chebula*) and Alkaloid (*Catharanthus roseus*).
- 18) Detection of adulterants of market samples of mustard seeds, coriander powder, pepper, teadust, coffee powder, chilli powder, turmeric powder.
- 19) Study of Biodiversity, composition of different types of forests in India.(Tropical, subtropical and Temperate).
- 20) Sources, properties and uses of fibres and paper.
- 21) Preparation of Vermicompost.
- 22) Visit to Nursery.

References:

6. Bose T. K and Mukherjee D, Gardening in India, Oxford and IBH Publishing Co, New Delhi.
7. Capon B., Botany for Gardeners. 3rd Edition. Timber Press Portl and, Oregon.
8. Sporne K. R. The morphology of Angiosperms. B. I. Publication, Bombay.
9. Kumar N., Introduction to Horticulture, Rajalakshmi Publications. Nagercoil.
10. Randhawa G. S. and Mukhopadhyay A., Horticulture in India, Allied Publishers, New Delhi.

EVALUATION PATTERN
Scheme of Marking: Theory

Sem.	Course Code	Marks	Evaluation	Sections	Answer Books	Standard of passing
V	DSC -1007E1	80	Semester Wise	I & II	As per Instruction	35%
V	DSC -1007E1	80	Semester Wise	I & II	As per Instruction	35%
VI	DSC-1007F1	80	Ssemester Wise	I & II	As per Instruction	35%
VI	DSC-1007F1	80	Ssemester Wise	I & II	As per Instruction	35%

Scheme of Marking: Continuous Internal Evaluation (CIE)

Sem.	Course Code	Marks	Evaluation	Sections	Answer Books	Standard of passing
V	DSC -1007E1 & E2	20	Semester wise/ Annual	-	As per Instruction	35% (7 marks)
VI	DSC -1007F1 & F2	20	Semester wise/ Annual	-	As per Instruction	35% (7 marks)

Scheme of Marking: Practical

Sem.	Course Code	Marks	Evaluation	Sections	Standard of Passingg
V AND VI	DSC -1007E1 (pr)	100	Semester wise/ Annual	As per Instruction	35%
	DSC -1007E2 (pr)				
V AND VI	DSC -1007F1 (pr)	100	Semester wise/ Annual	As per Instruction	35%
	DSC -1007F2 (pr)				

Nature of Question Paper

B.Sc. III (Sem. V & VI) Botany

Semester End Examination

Structure of Question Paper

Total Marks: 40

Time: 2 hours

Question No.	Question Pattern	Marks
Q.1	Select correct alternative. (MCQ).	08
Q.2	Attempt any two. (Long answer questions).	16
Q.3	Attempt any four. (Short notes).	16
	Total	40

**“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe**

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur
(Autonomous)**



DEPARTMENT OF STATISTICS

**B. Sc. Part - III
Semester-V&VI**

SYLLABUS

Under Choice Based Credit System

To be implemented from June, 2020

Course structure

Semester	Paper code	Title of Paper	Marks for Term end Exam	Internal Marks	No. of Credits
Sem-V	DSE 1004E1	Probability Distributions	80	20	4
	DSE 1004E2	Sampling Theory & Operations Research	80	20	4
	SEC 3	Statistical Computing using R		50	2
Sem-VI	DSE 1004F1	Statistical Inference	80	20	4
	DSE 1004F2	Design of Experiments, Quality Management & Data Mining	80	20	4
	SEC 4	Project Work		50	2

Note :

1. SEC -S Examination will be conducted annually for E & F separately. (50 marks each)
2. Project will be conducted in a group of 5 students

Practical

Paper No	Title of the Practical	Marks for Practical	Journal	Oral	Study Tour & Report	Total Marks
IV	Probability Distributions	40	04	04	08	50
V	Sampling Theory & Operations Research	40	04	04		50
VI	Statistical Inference	40	04	04		50
VII	Design of Experiments, Quality Management & Data Mining	40	04	04		50

Note

1. Nature of practical papers:

- (i) Each practical question paper must contain Four questions.
- (ii) Each question should contain Two bits from different units.
- (iii) Student should attempt Any Two questions.
- (iv) Each question should carry 20 marks and to be distributed according to Following points:
 - (a) Aim of the Experiment: 2 Marks
 - (b) Statistical formulae: 4 Marks
 - (c) Observation Tables: 6 Marks
 - (d) Calculations: 6 Marks
 - (e) Conclusion/ result of the experiment :2 Marks.

2. Instructions:

- (i) While attempting questions based on R-software students have to write the commands of R-software on their Answer-book. Final result should be shown to the examiner online or the printout may be attached.
- (ii) Duration of each practical paper should be of four hours.

B. Sc. Part - III Statistics
Semester: V Paper- DSE 1004E1
Probability Distributions

Marks: 80

Theory: 72 Hours

Credits 4

Section I: Probability Distributions-I

Course Outcomes:

At the end of this course students will be able to:

CO1: Understand the concept of standard continuous distributions.

CO2: Apply standard continuous probability distributions to different real life data/situations.

CO3: Learn the concept of truncated distribution and its applications

CO4: Learn Multinomial distribution and Bivariate Normal Distribution.

Unit	Content	Hours Allotted	Credits
1	<p>Univariate Continuous Probability Distributions</p> <p>1.1 Laplace (Double Exponential) Distribution P. d. f. with parameters (μ, λ), Nature of the probability curve, Distribution function, quartiles, m. g. f., mean, variance, moments, $\beta_1, \beta_2, \gamma_1$ and γ_2, Laplace distribution as the distribution of the difference of two i. i. d. exponential variates with parameter θ, examples and problems.</p> <p>1.2 Lognormal Distribution P.d.f. with parameters (μ, σ^2), Nature of the probability curve, mean, variance, median, mode, moments, $\beta_1, \beta_2, \gamma_1$ and γ_2 coefficients, Relation with $N(\mu, \sigma^2)$</p> <p>1.3 Cauchy Distribution P. d. f. with parameters (μ, λ), nature of the probability curve, distribution function, quartiles, non-existence of moments, additive property for two independent Cauchy variates (statement only), statement of distribution of the sample mean, relationship with uniform and Students' t distribution, distribution of X/Y where X and Y are i. i. d. $N(0, 1)$, examples and problems.</p> <p>1.4 Weibull Distribution P. d. f. with parameters (α, β), distribution function, quartiles, mean and variance, coefficient of variation, relation with gamma and exponential distribution, examples and problems.</p>	12	1
2	<p>Univariate and Multivariate Probability Distributions</p> <p>2.1 Logistic distribution: P.d.f. with parameters (μ, σ^2), c.d.f., mean, mode, variance, skewness using mode, applications.</p> <p>2.2 Paroto distribution:</p>	10	

	<p>P.d.f. with parameters (α, β), mean, variance, mode, skewness using mode, applications.</p> <p>2.3 Power series distribution: P.m.f. mean, mode, variance, Binomial, Poisson, Geometric and negative binomial distribution as particular cases of power series distribution.</p> <p>2.4 Multinomial distribution: P.m.f, m.g.f., marginal distribution, mean, variance, covariance, variance and covariance matrix, correlation coefficient, additive property, Trinomial distribution as particular case of multinomial distribution.</p>		1
3	<p>Truncated Distributions Truncated distribution as conditional distribution, truncation to the right, left and on both sides. Binomial distribution $B(n, p)$ left truncated at $X = 0$ (value zero not observable), its p.m.f, mean, variance. Poisson distribution $P(m)$, left truncated at $X = 0$ (value zero not observable), its p.m.f., mean and variance. Normal distribution $N(\mu, \sigma^2)$ truncated</p> <ul style="list-style-type: none"> (i) to the left below a (ii) to the right above b (iii) to the left below a and to the right above b, its p.d.f. and mean. <p>Exponential distribution with parameter λ left truncated below a, its p.d.f., mean and variance. Examples and problems.</p>	6	1
4	<p>Bivariate Normal Distribution p. d. f. of a bivariate normal distribution, $BN(\mu_1, \mu_2, \sigma_1^2, \sigma_2^2, \rho)$ marginal and conditional distributions, identification of parameters, conditional expectation and conditional variance, regression of Y on X and of X on Y., independence and uncorrelated-ness imply each other, m. g. f and moments. Distribution of $aX + bY + c$, where a, b and c are real numbers. Cauchy distribution as the distribution of $Z = X/Y$ where $(X, Y) \sim BN(0, 0, \sigma_1^2, \sigma_2^2, \rho)$, Examples and problems.</p>	8	1

Books Recommended

1. Cramer H.: Mathematical Methods of Statistics, Asia Publishing House, Mumbai.
2. Mood, A. M., Graybill K, Bose. D. C.: Introduction to Theory of Statistics. (Third edition) Mc-GrawHill Series.
3. Lindgren B. W.: Statistical Theory (Third Edition), Collier Macmillan International Edition, Macmillan Publishing Co. Inc. New York.
4. Hogg, R. V. and Craig A. T. : Introduction to Mathematical Statistics (Third Edition), Macmillan Publishing Company, Inc. 866, 34d Avenue, New York, 10022.
5. Sanjay Arora and Bansilal: New Mathematical Statistics (First Edition), Satya

- Prakashan, 16/17698, New Market, New Delhi, 5 (1989).
6. Gupta S. C and Kapoor V. K.: Fundamentals of Mathematical Statistics, Sultan Chand and Sons, 88, Daryaganj, New Delhi 2.
 7. Rohatgi V. K.: An Introduction to Probability Theory and Mathematical Statistics, Wiley Eastern Ltd., New Delhi.
 8. Feller. W.: An Introduction of Probability Theory and its Applications, Wiley Eastern Ltd. Mumbai.
 9. Jhonson and Kotz: Continuous Univariate Distributions I and II
: Discrete Distributions
: Multivariate Distributions
 10. Bhat B. R.: Modern Probability Theory. New Age International.

Section II: Probability Theory - II

Course Outcomes:

At the end of this course students will be able to:

CO1: Understand necessity of order statistics and its distributions.

CO2: Implement various laws of probability to get solution for different problems in Statistics.

CO3: Understand basic concepts of stochastic processes and their applications.

CO4: Apply Queuing theory and its real-life situations.

Unit	Content	Hours Allotted	Credits
1	<p>Order Statistics Order statistics for a random sample of size n from a continuous distribution, Joint distribution, definition, derivation of distribution function and density function of the i-th order statistic, particular cases for $i=1$ and $i=n$. Derivation of joint p. d. f. of i-th and j-th order statistics, statement of distribution of the sample range. Distribution of the sample median when n is odd. Examples and Problems.</p>	8	1
2	<p>Convergence and Limit Theorem 2.1: Convergence i. Definition of convergence of sequence of random variables (a) in probability, (b) in distribution, (c) in quadratic mean. ii. If $X_n^p \rightarrow X$ then $g(X_n^p) \rightarrow g(X)$ where g is continuous function without proof. Examples and Problems.</p> <p>2.2: Weak Law of Large Numbers and Central Limit Theorem iii. Weak law of large numbers (WLLN) statement and proof for i. i. d. random variables with finite variance. iv. Central limit theorem: Statement and proof for i. i. d. random variables with finite variance, proof based on m. g. f. v. Simple examples based on Bernoulli, binomial, Poisson and chi-square distribution.</p>	10	1
3	<p>Finite Markov Chains 3.1: Basic concepts:</p>	10	

	<p>Definition and examples of stochastic process, classification of general stochastic process into discrete – continuous time, discrete – continuous state space, type of stochastic process, problems and examples.</p> <p>3.2: Markov chain: Definition and examples of Markov chain, stochastic matrix, transition probability matrix, Chapman - Kolmogorov equation (statement only), n step transition probability matrix, classification of states, simple problems. Stationary probability distribution, applications.</p> <p>3.3: Continuous Markov chain: Pure birth process, Poisson process, birth and death process. (Derivations not expected). Examples and problems.</p>		1
4	<p>Queuing Theory</p> <p>i. Introduction, essential features of queuing system, input source, queue configuration, queue discipline, service mechanism.</p> <p>ii. Operating characteristics of queuing system, transient-state and steady state, queue length, general relationship among system characteristics.</p> <p>iii. Probability distribution in queuing system: Distribution of arrival, distribution of inter arrival time, distribution of departure and distribution of service time (Derivations are not expected).</p> <p>iv. Types of queuing models:</p> <p>v. Solution of queuing Model: M/M/1, using FCFS queue discipline.</p> <p>vi. Problems and examples.</p>	8	1

Books Recommended

3. Cramer H.: Mathematical Methods of Statistics, Asia Publishing House, Mumbai.
4. Lindgren B. W.: Statistical Theory (Third Edition), Collier Macmillan International Edition, Macmillan Publishing Co. Inc. New York.
5. Hogg, R. V. and Craig A. T. : Introduction to Mathematical Statistics (Third Edition), Macmillan Publishing Company, Inc. 866, 34d Avenue, New York, 10022.
6. Sanjay Arora and Bansilal: New Mathematical Statistics (First Edition), Satya Prakashan, 16/17698, New Market, New Delhi, 5 (1989).
7. Gupta S. C and Kapoor V. K.: Fundamentals of Mathematical Statistics, Sultan Chand and Sons, 88, Daryaganj, New Delhi 2.

8. Rohatgi V. K.: An Introduction to Probability Theory and Mathematical Statistics, Wiley Eastern Ltd., New Delhi.
9. Medhi J : Stochastic Processes. Wiley Eastern Ltd. New Delhi.
10. Hoel, Port and Stone: Introduction to Stochastic Processes, Houghton Mifflin.
11. Feller. W.: An Introduction of Probability Theory and its Applications. Wiley Eastern Ltd. Mumbai.
12. Bhat B. R.: Modern Probability Theory.
13. Karlin and Taylor: Stochastic process.
14. Ross S: Probability Theory.
15. Bhat B. R.: Stochastic Models: Analysis and Applications. New Age International.
16. Zacks S.: Introduction to Reliability Analysis, Probability Models and Statistical Methods, Springer Verlag.
17. Taha H. A.: Operation research – An Introduction, Fifth edition, Prentice Hall of India, New Delhi
18. Barlow R. E. and Proschan Frank: Statistical Theory of Reliability and Life Testing. Holt Rinebart and Winston Inc., New York.
19. Sinha S. K.: Reliability and Life Testing, Second Edition, Wiley Eastern Publishers, New Delhi.
20. Trivedi R. S.: Probability and Statistics with Reliability and Computer Science Application, Prentice – Hall of India Pvt. Ltd., New Delhi.
21. Parimal Mukhopadhyaya: An Introduction to the Theory of Probability. World Scientific Publishing.
- 22.

B. Sc. Part - III Statistics
Semester: V Paper- DSE 1004E2
Sampling Theory & Operation Research
Theory: 72 Hours

Marks: 80

Credits 4

Section I: Sampling Theory

Course Outcomes:

At the end of this course students will be able to:

CO1: Design and execute sample surveys and learn various sampling methods

CO2: Conduct sample surveys and select appropriate sampling techniques.

CO3: Compare various sampling techniques.

CO4: Learn different methods of estimation using auxiliary variables

Unit	Content	Hours Allotted	Credits
1	<p>Basic Terminology and Simple Random Sampling</p> <p>1.1: Basic Terminology Concept of distinguishable elementary units, sampling units, sampling frame, random sampling and non-random sampling. Advantages of sampling method over census method, objectives of a sample survey, Designing a questionnaire, Characteristics of a good questionnaire, Concept of sampling and non-sampling errors. Handling of non- response cases.</p> <p>1.2: Simple random sampling</p> <p>i. Simple random sampling from finite population of size N with replacement (SRSWR) and without replacement (SRSWOR): Definitions, population mean and population total as parameters, inclusion probabilities.</p> <p>ii. Following results with proof.</p> <p>a) In SRSWOR, the probability of a specified unit being selected in sample at any given draw is equal to $1/N$.</p> <p>b) In SRSWOR, the probability of a specific unit included in the sample is n/N.</p> <p>c) In SRSWOR, the probability of drawing a sample of size 'n' from a population of size N units is $1/\binom{N}{n}$.</p> <p>d) In SRSWR, the probability of a specific unit included in the sample is $1 - \left(1 - \frac{1}{N}\right)^n$</p> <p>e) In SRSWR, the probability of drawing a sample of size 'n' from a population of size N units is $1/N^n$</p> <p>iii. Sample mean \bar{y} as an estimator of population mean \bar{Y}_N, derivation of its expectation, standard error and estimator of standard error.</p>	12	1

	<p>iv. $N\bar{y}$ as an estimator of population total, derivation of its expectation, standard error and estimator of standard error.</p> <p>v. Sampling for dichotomous attributes. Estimation of population proportion Sample proportion (p) as an estimator of population proportion (P), derivation of its expectation, standard error and estimator of standard error using SRSWOR. Np as an estimator of total number of units in the population possessing the attribute of interest, derivation of its expectation, standard error and estimator of standard error.</p> <p>1.3: Determination of the sample size. Determination of the sample size (n) for the given: i. Margin of error and confidence coefficient. ii. Coefficient of variation of the estimator and confidence coefficient.</p>		
2	<p>Stratified Sampling</p> <p>i. Real life situations where stratification can be used.</p> <p>ii. Description of stratified sampling method where sample is drawn from individual stratum using SRSWOR method.</p> <p>a) \underline{y}_{st} as an estimator of population mean \bar{Y}_N, derivation of its expectation, standard error and estimator of standard error.</p> <p>b) $N\underline{y}_{st}$ as an estimator of population total, derivation of its expectation, standard error and estimator of standard error.</p> <p>iii. Problem of allocation: Proportional allocation, Neyman's allocation and optimum allocation, derivation of the expressions for the standard errors of the above estimators when these allocations are used.</p> <p>iv. Comparison amongst SRSWOR, stratification with proportional allocation and stratification with optimum allocation.</p> <p>v. Cost and variance analysis in stratified random sampling, minimization of variance for fixed cost, minimization of cost for fixed variance, optimum allocation as a particular case of optimization in cost and variance analysis.</p>	12	1
3	<p>Other Sampling Methods</p> <p>3.1: systematic Sampling</p> <p>i. Real life situations where systematic sampling is appropriate. Technique of drawing a sample using systematic sampling.</p> <p>ii. Estimation of population mean and population total, standard error of these estimators.</p> <p>iii. Comparison of systematic sampling with SRSWOR.</p>	8	1

	<p>iv. Comparison of systematic sampling with SRSWOR and stratified sampling in the presence of linear trend.</p> <p>v. Idea of Circular Systematic Sampling.</p> <p>3.2: Cluster Sampling</p> <p>i. Real life situations where cluster sampling is appropriate. Technique of drawing a sample using cluster sampling.</p> <p>ii. Estimation of population mean and population total (with equal size clusters), standard error of these estimators</p> <p>iii. Systematic sampling as a particular case of cluster sampling.</p> <p>3.3: Two Stage and Multi Stage Sampling</p> <p>Idea of two-stage and multistage sampling.</p>		
4	<p>Sampling Methods using Auxiliary variables</p> <p>4.1: Ratio Method</p> <p>i. Concept of auxiliary variable and its use in estimation</p> <p>ii. Situations where Ratio method is appropriate.</p> <p>iii. Ratio estimators of the population mean and population total and their standard errors (without derivations), estimators of these standard errors.</p> <p>iv. Relative efficiency of ratio estimators with that of SRSWOR</p> <p>4.2: Regression Method</p> <p>i. Situations where Regression method is appropriate.</p> <p>ii. Regression estimators of the population mean and population total and their standard errors (without derivations), estimators of these standard errors.</p> <p>iii. Comments regarding bias in estimation</p> <p>iv. Relative efficiency of regression estimators with that of</p> <p>a) SRSWOR b) Ratio estimator.</p>	4	1

Books Recommended

1. Cochran, W.G: Sampling Techniques, Wiley Eastern Ltd., New Delhi.
2. Sukhatme, P.V. and Sukhatme, B.V.: Sampling Theory of Surveys with Applications, Indian Society of Agricultural Statistics, New Delhi.
3. Des Raj: Sampling Theory.
4. Daroga Singh and Choudhary F.S.; Theory and Analysis of Sample Survey Designs, Wiley Eastern Ltd., New Delhi.
5. Murthy, M.N: Sampling Methods, Indian Statistical Institute, Kolkata.
6. Mukhopadhyay, Parimal: Theory and Methods of Survey Sampling, Prentice Hall.

Section II: Operation Research

Course Outcomes:

At the end of this course students will be able to:

CO1: Convert practical situations to the format of linear programming problem and solve Linear

Programming Problems.

CO2: Understand special cases of LPP viz. transportation problem, assignment problem.

CO3: Learn different decision-making environments.

CO4: Simulate random numbers from different distributions.

Unit	Content	Hours Allotted	Credits
1	<p>Linear programming</p> <p>1.1: Basic concepts Statement of the Linear Programming Problem (LPP), formulation of problem as Linear programming problem. Definition of (i) a slack variable, (ii) a surplus variable. L.P. problem in (i) canonical form, (ii) standard form. Definition of (i) a solution, (ii) a feasible solution, (iii) basic variable and non-basic variable, (iv) a basic feasible solution, (v) a degenerate and a non-generate solution, (vi) an optimal solution.</p> <p>1.2: Solution of L.P.P. i. Graphical Method: Solution space, obtaining an optimal solution, unique and non- unique optimal solutions. ii. Simplex Method: a) Initial basic feasible solution (IBFS) is readily available: obtaining an IBFS, criteria for deciding whether obtained solution is optimal, criteria for unbounded solution, more than one optimal solution. b) IBFS not readily available: introduction of artificial variable, Big-M method, modified objective function, modifications and applications of simplex method to L.P.P., criterion for no solution.</p> <p>1.3: Duality Theory: Writing dual of a primal problem, solution of L.P.P. with artificial variable. Examples and problems.</p>	12	1
2	<p>Transportation and Assignment Problems</p> <p>2.1: Transportation problem i. Transportation problem (T. P.), statement of T. P., balanced and unbalance T. P. ii. Methods of obtaining initial basic feasible solution of T.P. (a)</p>	10	

	<p>North West corner rule (b)Method of matrix minima (least cost method), (c) Vogel's approximation (VAM).</p> <p>iii. MODI method of obtaining Optimal solution of T. P, uniqueness and non- uniqueness of optimal solutions, degenerate solution.</p> <p>iv. Examples and problems.</p> <p>2.2: Assignment Problem</p> <p>i. Statement of an assignment problem, balanced and unbalanced assignment problem, relation with T.P, optimal solution of an assignment problem using Hungarian method.</p> <p>ii. Examples and problems.</p> <p>2.3: Sequencing Problem</p> <p>i. Introduction. Statement of problem.</p> <p>ii. Procedure of processing n jobs on two machines.</p> <p>iii. Procedure of processing n jobs on three machines and m machines. Computations of elapsed time and idle times.</p> <p>iv. Examples and problems.</p>		1
3	<p>Decision Theory</p> <p>i. Introduction, steps in decision theory approach.</p> <p>ii. Type of decision-making environments.</p> <p>iii. Decision making under uncertainty: Criteria of optimism, criteria of pessimism, equally likely decision criterion, criterion of regret.</p> <p>iv. Decision making under risk: Expected monetary value, expected opportunity loss, expected value of perfect information.</p> <p>v. Examples and problems.</p>	06	1
4	<p>Simulation Techniques</p> <p>Meaning of simulation, Monte Carlo simulation, advantages and disadvantages of simulation, definition and properties of random numbers, generation of pseudo random numbers, Mid-Square method, Techniques of generating random numbers from uniform distribution, Tests for randomness and uniformity distribution, random variate generation using inverse cdf method, random variate generation from Bernoulli, Binomial, Poisson, Geometric, Exponential and normal distributions.</p>	08	1

Book Recommended

1. Gass E.: Linear Programming Method and Applications, Narosa Publishing House, New Delhi.
2. Shrinath L. S.: Linear Programming.
3. Taha H. A.: Operation research – An Introduction, Fifth Edition, Prentice Hall of

India, New Delhi.

4. Saceini, Yaspan, Friedman: Operations Research Method and Problems, Wiley International Edition.
5. Shrinath, L. S.: Linear Programming, Affiliated East-West Press Pvt. Ltd., New Delhi.
6. Phillips, D. T., Ravindra, A., Solberg, J.: Operations Research Principles and Practice, John Wiley and Sons Inc.
7. Sharma, J. K.: Mathematical Models in Operations Research, Tau McGraw Hill Publishing Company Ltd., New Delhi.
8. Kapoor, V. K.; Operations Research, Sultan Chand and Sons, New Delhi.
9. Gupta, P. K. and Hira, D. S.: Operations Research, S. Chand and Company Ltd., New Delhi.
10. Luc Devroye: Non-Uniform Random Variate Generation, Springer - Verlag, New York.
11. Gentle, J. E.: Random Number Generation and Monte Carlo Methods, Springer-Verlag.
12. Robert, C. P. and Casella, G.: Monte Carlo Statistical methods, Springer-Verlag.
13. Rubinstien, R. Y.: Simulation and Monte Carlo Method, John Wiley, New York.

B. Sc. Part - III Statistics
Semester: VI Paper- DSE 1004F1
Probability Theory & Statistical Inference - II
Theory: 72 Hours

Marks: 80

Credits 4

Section I : Statistical Inference - I

Course outcomes:

At the end of this course students will be able to:

CO1: Get acquainted with notion of parameter and estimator.

CO2: Understand concept of point estimation and learn important properties of estimator.

CO3: Understand concept of CR inequality.

CO4: know different methods of estimation.

Unit	Content	Hours Allotted	Credits
1	<p>Point Estimation</p> <p>1.1 Notion of a parameter, parameter space, general problem of estimation, estimating an unknown parameter by point and interval estimation.</p> <p>1.2 Point estimation: Definition of an estimator (statistic) & its S.E., distinction between estimator and estimate, illustrative examples. Properties of estimator: Unbiased estimator, biased estimator, positive and negative bias, examples of unbiased and biased estimators. Proofs of the following results regarding the unbiased estimators:</p> <p>(a) Two distinct unbiased estimators of $\Psi(\theta)$ give rise to infinitely many unbiased estimators of $\Psi(\theta)$</p> <p>(b) If T is unbiased estimator of θ then $\Psi(T)$ is an unbiased estimator of $\Psi(\theta)$ provided $\Psi(.)$ is a linear function. Sample variance is a biased estimator of the population variance. Illustration of unbiased estimator for the parameter and parametric function.</p> <p>1.3 Relative efficiency of T_1 with respect to T_2, where T_1 and T_2 are unbiased estimators. Use of mean square error to modify the above definition for biased estimator. Minimum Variance Unbiased Estimator (MVUE) and Uniformly Minimum Variance Unbiased Estimator (UMVUE), uniqueness of UMVUE whenever it exists. Illustrative examples.</p> <p>1.4 Consistency: Definition, proof of the following</p> <p>(c) Sufficient condition for consistency,</p> <p>(d) If T is consistent for θ and $\Psi(.)$ is a continuous function then $\Psi(T)$ is consistent for $\Psi(\theta)$</p> <p>Illustrative examples.</p>	12	1
2	<p>Likelihood and Sufficiency</p> <p>2.1 Definition of likelihood function as a function of the parameter θ for a random sample from discrete and continuous</p>	10	

	<p>distributions. Illustrative examples.</p> <p>2.2 Sufficiency: Concept of sufficiency, definition of sufficient statistic through (i) conditional distribution (ii) Neyman factorization criterion. Pitman Koopmans form and sufficient statistic. Proof of the following properties of sufficient statistic:</p> <p>a) If T is sufficient for θ then $\Psi(T)$ is also sufficient for θ provided $\Psi(\cdot)$ is a one to one function.</p> <p>b) If T is sufficient for θ then T is sufficient for $\Psi(\theta)$</p> <p>2.3 Fisher information function: Definition of information function, amount of information contained in a sample. Statement regarding equality of the information in (x_1, x_2, \dots, x_n) and in a sufficient statistic T, concept of minimal sufficient statistic. With illustrations to exponential family. Illustrative examples.</p>		1
3	<p>Cramer Rao Inequality</p> <p>Statement and proof of Cramer Rao inequality. Definition of Minimum Variance Bound Unbiased Estimator (MVBUE) of $\Psi(\theta)$. Proof of the following results:</p> <p>(i) If MVBUE exists for θ then MVBUE exists for $\Psi(\theta)$, if $\Psi(\cdot)$ is a linear function.</p> <p>(ii) If T is MVBUE for θ then T is sufficient for θ. Examples and problems.</p>	6	1
4	<p>Methods of Estimation</p> <p>4.1 Method of maximum likelihood, derivation of maximum likelihood estimators for parameters of standard distributions. Use of iterative procedure to derive MLE of location parameter μ of Cauchy distribution, invariance property of MLE, relation between MLE and sufficient statistic. Illustrative examples.</p> <p>4.2 Method of moments: Derivation of moment estimators for standard distributions. Illustrations of situations where MLE and moment estimators are distinct and their comparison using mean square error (for uniform distribution). Illustrative examples.</p> <p>4.3 Method of minimum chi-square: Definition, derivation of minimum chi-square estimator for the parameter. Illustrative examples.</p>	8	1

Books Recommended

1. Kale, B. K.: A first Course on Parametric Inference
2. Rohatgi, V. K.: Statistical Inference
3. Rohatgi, V. K.: An introduction to Probability Theory and Mathematical Statistics
4. Saxena H. C. and Surenderan : Statistical Inference
5. Kendall M. G. and Stuart A.: An advanced Theory of Statistics

6. Lindgren, B. W.: Statistical Theory
7. Lehmann, E. L.: Theory of Point Estimation
8. Rao, C. R.: Linear Statistical Inference
9. Dudewicz C. J. and Mishra S. N. : Modern Mathematical Statistics
10. Fergusson, T. S.: Mathematical statistics.
11. Zacks, S.: Theory of Statistical Inference.
12. Cramer, H.: Mathematical Methods of Statistics.
13. Cassela G. and Berger R. L.: Statistical Inference

Section II: Statistical Inference - II

Course outcomes:

At the end of this course students will be able to:

CO1: Understand concept of interval estimation.

CO2: Learn concept of testing of hypothesis and different test procedures.

CO3: Learn nonparametric statistical inference.

CO4: Learn comparative study of parametric test and non-parametric tests.

Unit	Content	Hours Allotted	Credits
1	<p>Interval Estimation</p> <p>1.1: Notion of interval estimation, definition of confidence interval, length of confidence interval, confidence bounds. Definition of Pivotal quantity and its use in obtaining confidence intervals and bounds.</p> <p>1.2: Interval estimation for the following cases:</p> <ol style="list-style-type: none"> i. Mean μ of normal distribution (σ^2 known and σ^2 unknown). ii. Variance σ^2 of normal distribution (μ known and μ unknown). iii. Difference between two means $\mu_1 - \mu_2$, <ol style="list-style-type: none"> a) for a sample from bivariate normal population, b) for samples from two independent normal populations. iv. Ratio of variances for samples from two independent normal populations. 	9	1

	<ul style="list-style-type: none"> v. Mean of exponential distribution. vi. Population proportion and difference of two population proportions of two independent large samples. vii. Population median using order statistics. viii. Illustrative examples. 		
2	<p>Parametric Tests</p> <p>2.1: Statistical hypothesis, problems of testing of hypothesis, definitions and illustrations of simple hypothesis composite hypothesis, critical region, type I and type II error, probabilities of type I & type II errors. Power of a test, p-value, size of a test, level of significance, problem of controlling probabilities of type I & type II errors.</p> <p>2.2: Definition of Most Powerful (MP) test. Statement and proof (sufficient part) of Neyman-Pearson (NP) lemma for simple null hypothesis against simple alternative hypothesis for construction of MP test. Examples of construction of MP test of level α.</p> <p>2.3: Power function of a test, power curve, definition of uniformly most powerful (UMP) level α test. Use of NP lemma for constructing UMP level α test for one-sided alternative. Illustrative examples.</p> <p>2.4: Likelihood Ratio Test: Procedure of likelihood ratio test, statement of its properties, Likelihood Ratio test involving mean and variance of normal population.</p>	10	1
3	<p>Sequential Tests</p> <p>General theory of sequential analysis and its comparison with fixed sample procedure. Wald's SPRT of strength (α, β), for simple null hypothesis against simple alternative hypothesis. Illustrations for standard distributions like binomial, Poisson, exponential and normal. Graphical and tabular procedure for carrying out the test. Illustrative examples.</p>	7	1
4	<p>Non- parametric Test</p> <p>Notion of non-parametric statistical inference (test) and its comparison with parametric statistical inference. Concept of distribution free statistic. Test procedure of:</p> <ul style="list-style-type: none"> i. Run test for one sample (i.e. test for randomness) and run test for two independent sample problems. ii. Sign test for one sample and two sample paired observations iii. Wilcoxon's signed rank test for one sample and two sample paired observations. iv. Mann-Whitney U - test (two independent samples) v. Median test vi. Kolmogorov Smirnov test for one and for two independent 	10	1

Books Recommended

1. Kale, B. K.: A first Course on Parametric Inference
2. Rohatgi, V. K.: Statistical Inference
3. Rohatgi, V. K.: An introduction to Probability Theory and Mathematical Statistics
4. Saxena H. C. and Surenderan : Statistical Inference
5. Kendall M. G. and Stuart A.: An advanced Theory of Statistics
6. Lindgren, B. W.: Statistical Theory
7. Cassela G. and Berger R. L.: Statistical Inference
8. Lehmann, E. L: Testing of Statistical Hypothesis
9. Rao, C. R.: Linear Statistical Inference
10. Dudewicz C. J. and Mishra S. N. : Modern Mathematical Statistics
11. Fergusson, T. S.: Mathematical statistics.
12. Zacks, S.: Theory of Statistical Inference.
13. Cramer, H.: Mathematical Methods of Statistics.
14. Gibbons, J. D.: Non-parametric Statistical Inference.
15. Doniel: Applied Non-parametric Statistics
16. Siegel, S.: Non-parametric Methods for the behavioral sciences.
17. Kunte, S.: Purohit, S. G. and Wanjale, S.K.: Lecture notes on Non-parametric Tests.

B. Sc. Part - III Statistics
Semester: VI Paper- DSE 1004F2

Design of Experiments, Quality Management & Data Mining

Marks: 80

Theory: 72 Hours

Credits 4

Section I: Design of Experiments

Course outcomes:

At the end of this course students will be able to:

CO1: Understand the basic terms in design of experiments carry out one-way and two-way

analysis of variance.

CO2: Apply appropriate experimental design in real life.

CO3: Understand concept of efficiency of design and ANOCOVA.

CO4: Understand factorial experiments and confounding.

Unit	Content	Hours Allotted	Credits
1	<p>Simple Designs of Experiments I:</p> <p>1.1: Basic Concepts:</p> <ul style="list-style-type: none"> i. Basic terms in design of experiments: Experimental unit, treatment, layout of an experiment. ii. Basic principles of design of experiments: Replication, randomization and local control. iii. Choice of size and shape of a plot for uniformity trials, the empirical formula for the variance per unit area of plots. <p>1.2: Completely Randomized Design (CRD)</p> <ul style="list-style-type: none"> i. Application of the principles of design of experiments in CRD, layout, model, assumptions and interpretations: ii. Estimation of parameters, expected values of mean sum of squares, components of variance. iii. Breakup of total sum of squares in to components. iv. Technique of one-way analysis of variance (ANOVA) and its applications to CRD. v. Testing for equality for treatment effects and its interpretation. F-test for testing H_0, test for equality of two specified treatment effects 	8	1
2	<p>Simple Design of Experiments II</p> <p>2.1 Randomized Block Design (RBD):</p> <ul style="list-style-type: none"> i. Application of the principles of design of experiments in RBD, layout, model, assumptions and interpretations: ii. Estimation of parameters, expected values of mean sum of squares, components of variance. iii. Breakup of total sum of squares into components. iv. Technique of two-way analysis of variance (ANOVA) and 	12	1

	<p>its applications to RBD.</p> <ul style="list-style-type: none"> v. Tests and their interpretations, test for equality of two specified treatment effects, vi. comparison of treatment effects using critical difference (C.D.). vii. Idea of missing plot technique. viii. Situations where missing plot technique is applicable. ix. Analysis of RBD with single missing observation. <p>2.2 Latin Square Design (LSD)</p> <ul style="list-style-type: none"> i. Application of the principles of design of experiments in LSD, layout, model, assumptions and interpretations: ii. Breakup of total sum squares into components. iii. Estimation of parameters, expected values of mean sum of squares, components of variance. preparation of analysis of variance (ANOVA) table. iv. Tests and their interpretations, test for equality of two specified treatment effects, comparison of treatment effects using critical difference (C.D.). v. Analysis of LSD with single missing observation. vi. Identification of real-life situations where CRD, RBD AND LSD are used. 		
3	<p>Efficiency of design and ANOCOVA</p> <p>3.1 Efficiency of design</p> <ul style="list-style-type: none"> i. Concept and definition of efficiency of a design. ii. Efficiency of RBD over CRD. iii. Efficiency of LSD over CRD and LSD over RBD. <p>3.2 Analysis of Covariance (ANOCOVA) with one concomitant variable</p> <ul style="list-style-type: none"> iv. Purpose of analysis of covariance. v. Practical situations where analysis of covariance is applicable. vi. Model for analysis of covariance in CRD and RBD. Estimation of parameters (derivations are not expected). vii. Preparation of analysis of covariance (ANOCOVA) table, test for $\beta = 0$, test for equality of treatment effects (computational technique only). <p>Note: For given data, irrespective of the outcome of the test of regression coefficient β, ANOCOVA should be carried out.</p>	08	1
4	<p>Factorial Experiments</p> <ul style="list-style-type: none"> i. General description of factorial experiments, 2^2 and 2^3 factorial experiments arranged in RBD. ii. Definitions of main effects and interaction effects in 2^2 and 2^3 factorial experiments. iii. Model, assumptions and its interpretation. iv. Preparation of ANOVA table by Yate's procedure, test for main effects and interaction effects. 	08	1

	<ul style="list-style-type: none"> v. General idea and purpose of confounding in factorial experiments. vi. Total confounding (Confounding only one interaction): ANOVA table, testing main effects and interaction effects. vii. Partial Confounding (Confounding only one interaction per replicate): ANOVA table, testing main effects and interaction effects. viii. Construction of layout in total confounding and partial confounding in 2^3 factorial experiment. 		
--	--	--	--

Books Recommended

1. Federer, W.T.: Experimental Design, Oxford and IBH publishing Company, New Delhi.
2. Cochran, W.G. and Cox, G.M.: Experimental Design, John Wiley and Sons, Inc., New York.
3. Montgomery, D.C.: Design and Analysis of Experiments, Wiley Eastern Ltd., New Delhi.
4. Das, M.N. and Giri, N.C.: Design and Analysis of Experiments, Wiley Eastern Ltd., New Delhi.
5. Goulden, G.H.: Methods of Statistical Analysis, Asia Publishing House, Mumbai.
6. Kempthorne, O.: Design and Analysis of Experiments, Wiley Eastern Ltd., New Delhi.
7. Snedecor, G.W. and Cochran, W.G.: Statistical Methods, Affiliated East-West Press, New Delhi.
8. Goon, Gupta, Dasgupta: Fundamental of Statistics, Vol. I and II, The World Press Pvt. Ltd. Kolkata.
9. Gupta, S.C. and Kapoor, V.K.: Fundamentals of Applied Statistics, S. Chand & Sons, New Delhi.
10. C.F. Jeff Wu, Michael Hamada: Experiments, Planning Analysis and Parameter Design Optimization.

Section II: Quality Management and Data Mining

Course outcomes:

At the end of this course students will be able to:

- CO1: Learn concepts of quality and tools used in quality management.
- CO2: Learn various control charts for monitoring process control
- CO3: Understand different sampling plans for product control.
- CO4: Know basics of data mining.

Unit	Content	Hours Allotted	Credits

1	Quality Tools Meaning and dimensions of quality, quality philosophy, Magnificent tools of quality: Histogram, Check sheet, Pareto diagram, cause and effect diagram, scatter diagram, control chart, flow chart. Deming's PDCA cycle for continuous improvements and its applications.	08	1
2	Process Control CUSUM chart, tabular form, use of these charts for monitoring process mean. Moving average and exponentially weighted moving average charts. Introduction to six-sigma methodology, DMAIC cycle and case studies.	10	1
3	Product Control Sampling Inspection plans for attribute inspection: Concept of AQL, LTPD, Consumer's risk, producer's risk, AOQ, AOQL, OC, ASN and ATI. Description of Single and double sampling plans with determination of above constants.	10	1
4	Data Mining. 4.1: Data preparation for knowledge discovery: Data understanding and data cleaning tools, Data transformation, Data Discretization, Data Visualization. 4.2: Data Mining Process: CRISP and SEEMA; Concept of training data, testing data and validation of model. Supervised and unsupervised learning techniques: Problem of classification, classification techniques: k nearest neighbor, Naïve Bayes rule for two- class problem with only one attribute variable, accuracy sensitivity and specificity of classifiers, cluster analysis using k-means with illustration for bivariate data.	08	1

Books Recommended

1. Introduction to quality Control - Montgomery D. C.
2. Quality Control and Industrial statistics Duncan A J
3. Statistical Quality Control by E L Grant
4. Data Mining-Concept and Techniques: JiaweiHan.MichelineKamber and Jian Pei.
5. Data Mining- Introductory and Advanced Topics: Margret.H and Dunham
6. Introduction to Data Mining with case studies: G.K.Gupta
7. Data Mining Application with R: Zhao.

Practical Paper IV

Probability Distributions and R - Software

1. Model sampling from Laplace and Cauchy distributions
2. Model sampling from pareto distribution
3. Model sampling from truncated binomial and poison distributions.
4. Model sampling from truncated normal and exponential distributions.
5. Model sampling from bivariate normal distribution.
6. Fitting of truncated binomial distribution.
7. Fitting of truncated Poisson distribution.
8. Application of multinomial distribution.
9. Application of bivariate normal distribution.
10. Data input/output, diagrammatic and graphical representation of data using R-Software.
11. Computation of probabilities of type I and type II errors and power of a test using R- Software.
12. Model sampling from log-normal and Weibull distributions using R-Software.
13. Model sampling from logistic distribution using R-Software.
14. Fitting of Binomial and Poisson distribution using R-Software.
15. Fitting of Normal distribution using R-Software.
16. Fitting of log-normal distribution using R-Software.
17. Analysis of Completely Randomized Design (CRD)using R-Software.
18. Analysis of Randomized Block Design (RBD)using R-Software.

Reference Books:

1. Purohit Sudha: Lecture notes on R.
2. Verzani: Using R for introductory Statistics.

PRACTICAL PAPER - V

Statistical Inference - I

1. Point estimation by method of moments for discrete distributions.
2. Point estimation by method of moment for continuous distributions.
3. Point estimation by method of maximum likelihood (one parameter).
4. Point estimation by method of maximum likelihood (two parameters).
5. Point estimation by method of minimum chi-square.
6. Interval estimation of location and scale parameters of normal distribution (single sample).
7. Interval estimation of difference of location and ratio of scale parameters of normal distribution (two samples).
8. Interval estimation for population proportion and difference between two population proportions.
9. Interval estimation for population median using order statistics.
10. Construction of MP test.
11. Construction of UMP test.
12. Construction of SPRT for binomial, Poisson distributions, graphical representation of procedure.
13. Construction of SPRT for exponential and normal distribution, graphical representation of procedure.
14. NP test- -Run test (for one and two independent samples).
15. NP test -Sign test and Wilcoxon's signed rank test (for one and two samples paired observation).
16. 16 NP test-- Mann-Whitney U- test (for two independent samples).
17. NP test -Median test (for two large independent samples)
18. NP test – Kolmogorov - Smirnov test (for one and two independent samples).

PRACTICAL PAPER - VI

Design of Experiments and Sampling Methods

1. Analysis of CRD and RBD.
2. Analysis of Latin Square Design (LSD).
3. Missing Plot Technique for RBD and LSD with one missing observation.
4. Efficiency of i) RBD over CRD and ii) LSD over CRD and RBD.
5. Analysis of Covariance in CRD.
6. Analysis of Covariance in RBD.
7. Analysis of 2² and 2³ Factorial Experiment.
8. Total Confounding.
9. Partial Confounding.
10. Simple Random Sampling for Variables.
11. Simple Random Sampling for Attributes.
12. Determination of Sample Size in SRS for Variables and Attributes.
13. Stratified Random Sampling - I
14. Stratified Random Sampling - II
15. Ratio Method of Estimation.
16. Regression Method of Estimation.
17. Systematic Sampling.
18. Cluster Sampling.

PRACTICAL PAPER VII

Operations Research and Quality Management

1. L.P.P. by simplex method I (Slack variable)
2. L.P.P. by simplex method II (Big M method)
3. Transformation problem-I.
4. Transformation problem-II. (Degeneracy)
5. Assignment problem.
6. Sequencing Problem.
7. Decision Theory.
8. Simulation I (Discrete distribution)
9. Simulation II (Continuous distribution)
10. EWMA-Chart.
11. CUSUM chart.
12. Six sigma limits for mean.
13. Single sampling plan-I (Small sample).
14. Single sampling plan-II (Large sample).
15. Double sampling plan-I (Small sample).
16. Double sampling plan-II (Large sample).
17. k-nearest neighbor technique for classification.
18. k-means technique for clustering.

Skill Enhancement Course I

Statistical Computing Using R

The main objective of the course is to get acquainted with

- R programming with some basic notations for developing their own simple programs. And visualizing graphics in R.
- Generation of random sample from various distributions by inverse transformation method.
- Handling of data sets using R.

Syllabus

1. Installation and introduction to R, History.
2. Data Input/ Output and Operators
Assignment Operators in R: Leftwards assignment (<-, <<-, =), Rightwards assignment (->, ->>)
-Creation of vector using commands: Combine (c), scan, cbind, rbind, seq, rep, edit, sort, length, which, order.
-Relation operators: Less than, Greater than, Less than or equal to, Greater than or equal to, Equal to, Not equal to.
-Logical Operators: Logical NOT, Element-wise logical AND, Logical AND, Element-wise logical OR, Logical OR
3. Operations on data
-Operations on vectors: sum, prod, sort, rank, multiplication, division, exponent, modulus, integer division, max, min, summary.
- Object identification: is.na, is.numeric, is.character, is.matrix, is.vector, is.null, is.factor. as. Functions.
4. Matrix manipulation:
-Creation of Matrix, Transpose, Addition, Subtraction, Multiplication, Determinant, Inverse of matrix, rank of matrix, diagonal matrix, zero matrix, common matrix.
5. Creation of data frame using commands: data.frame, dimension of data frame, extracton of elements of data frame, rbind, cbind functions, rowSums, colSums, rowMeans, colMeans, subset, attach, detach, apply functions.
6. Import and export data: read.table, read.csv, file.choose, write.table, write.csv.
7. Data visualization: r plot, Scatter Plot, hist, boxplot.
- Diagrammatic representation of data: simple bar diagram, Sub - divided simple bar diagram, pie diagram.
- Graphical representation of data: Histogram, frequency polygon, Ogive curves.
8. For loop, while loop, if else statement, break statement.
9. Exploratory data analysis: mean, variance, quantiles, pdf, cdf, random numbers, correlation, summary.
10. Statistical tools: prop.test, t.test, wilcox.test, ks.test, chisq.test, cor.test, linear regression, Installation of packages.

Skill Enhancement Course II

Project Work

The main objective of this course is to acquaint students with the following concepts.

- To prepare the report of the project
- To apply different methods of collection of data if any
- To analyze the data using statistical tools
- To make the presentation of the project work

The students are supposed to carry out project work during this semester. This project work should be done in a group of not more than 5 students. The project will be evaluated on the following parameters:

Sr. No.	Distribution of work	Marks
1	Initial presentation of the problem	10
2	Data collection/ Methods to be used / layout of project	10
3	Submission of the project & final presentation in scheduled time	20
4	Attendance & active participation for project work	10

Note: Viva would be conducted individually. Viva will be taken for 15 minutes for each candidate.

**Assessment Structure
Structure of Question Paper
Internal Evaluation**

Semester	Evaluation	Marks
V	1. Unit test 2. Multiple choice questions.	10 10
VI	1. Unit test 2. Multiple choice questions.	10 10

Nature of Theory Question Paper

Instructions:

- 1) All questions are compulsory.
- 2) Answers to the two sections should be written in same answer book.
- 3) Figures to the right indicate full marks.
- 4) Use of scientific calculator is allowed.

SECTION-I

Time : 2 hour

Total Marks: 40

Q.1. Choose correct alternative.

(8x1=8)

Q.2 Attempt any two.

(8x2=16)

A)

B)

C)

Q.3. Attempt any four.

(4x2=16)

a)

b)

c)

d)

e)

f)

SECTION-II

Time : 2 hour

Total Marks: 40

Q.1. Choose correct alternative.

(8x1=8)

Q.2 Attempt any two.

(8x2=16)

A)

B)

C)

Q.3. Attempt any four.

(4x2=16)

a)

b)

c)

d)

e)

f)

Dissemination of Education for Knowledge, Science and Culture"
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF MATHEMATICS

**B.Sc. Part - III
Semester-V & VI**

SYLLABUS

Under Choice Based Credit System

to be implemented from Academic Year 2020-21

Course Structure
B.Sc.Part-III [Semester V]

Course code	Title o the course	Instructions Lectures /Week	Duration of term end exam	Marks Term end exam	Marks (Internal) Continuous Assessment	Credit
DSC - 1003E1	Real Analysis and Abstract Algebra	6	3 hours	80	20	4
DSC - 1003E2	Matrix Algebra/ Optimization Techniques and Numerical Methods-I	6	3hours	80	20	4
SEC-SE	Programming in C++	3	2.4	50	--	2

B. Sc. Part-III [Semester VI]

Course code	Title o the course	Instructions Lectures /Week	Duration of term end exam	Marks Term end exam	Marks (Internal) Continuous Assessment	Credit
DSE 1003F1	Metric Spaces and Linear Algebra	6	3 hours	80	20	4
DSE 1003F2	Complex Analysis and Numerical Methods-II	6	3 hours	80	20	4
SEC-SF	Transportation problem and its mathematical formulation	3	2.4	50	--	2

Core Course Practical in Mathematics [CCPM IV to VII] Total Credit 08

Course code	Title o the course	Instructi ons Lectures /Week	Duration of term end exam	Marks [End of academic year]	Credit
CCPM IV	Operations Research	5	6 hours	50	2
CCPM V	Numerical Methods	5	6 hours	50	2
CCPM VI	Python Programming	5	6 hours	50	2
CCPM VII	Project, sturdy tour, viva.	5	6 hours	50	2

B.Sc. III MATHEMATICS CBCS

Semester: V Paper V

Real analysis and Modern Algebra (DSC -1003 E1)

Theory: 72 Hours (96 lectures of 48 minutes) - Credits -4 (Marks-100)

Section I: Real Analysis

Course Outcomes:

After studying this course student will able to

CO1: Understand The characteristics of set of real number..

CO2: Learn Sequence and series of real numbers and their properties.

CO3: Use the ratio, root, alternating series and limit comparison test for convergence and absolute convergence of infinite series of real numbers

CO4: Learn Riemann Integral and Improper Integral.

Unit	Contents	Hours Allotted
1	The algebraic and ordered properties of \mathbb{R} , Absolute value and real line, The completeness property of \mathbb{R} , Application of supremum property, Intervals. Sequence: Definition and examples, Limit of Sequence, Limit Theorems, Monotone Sequences, Subsequences and The Bolzano-Weierstrass Theorem, The Cauchy Criterion, Property of Divergent Sequences, Introduction to Series: Definition and examples, n^{th} term Test, Cauchy Criterion for the series, Comparison Tests, Cauchy Condensation Test.	20
2	The Riemann integral: Definition, examples and properties, Riemann integrable functions, The squeeze Theorem, Classes of Riemann integrable functions, The fundamental Theorem. Improper integral, Definition of improper integral of first kind, Comparison test, μ - test for Convergence, Absolute and conditional convergence, Integral test for convergence of series, Definition of improper integral of second kind and some tests for their convergence, Cauchy principle value.	16

Recommended Book:

1. R. G. Bartle, D. R Sherbert,, Introduction to Real Analysis, John Wiley and Sons(Asia) P. Ltd., 2000.
2. D. Somasundaram , B Choudhary, First Course in Mathematical Analysis, NarosaPublishing House , New Delhi, Eighth Reprint 2013.

Reference Books:

1. T. M. Apostol, Calculus (Vol. I), John Wiley and Sons (Asia) P. Ltd., 2002.
2. K. A. Ross, Elementary Analysis- The Theory of Calculus Series- Undergraduate Texts inMathematics, Springer Verlag, 2003.
3. R. R. Goldberg, Methods of Real Analysis, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

Section II: Modern Algebra

Course Outcomes:

After studying this course student will able to

CO1: Understand an algebraic structures Group and ring.

CO2: Understand Properties and terminologies related to Group and Ring.

CO3: Apply fundamental theorem, Isomorphism theorems of groups to prove these theorems for Ring.

CO4: Recognize the mathematical objects that are group and classify them as abelian, cyclic and permutation group.

Unit	Contents	Hours Allotted
1	Binary operations – Definitions and properties, Groups – Definition and elementary properties, Finite groups and composition tables, Subgroups and its properties, Generators and cyclic groups, Permutations – Functions and permutations cycles and cyclic notation, even, odd, permutations, Symmetric group, Alternating groups. Cyclic groups- elementary properties, The classification of cyclic groups, Isomorphisms –Definition and elementary properties, Cayley’s theorem, Groups of cosets, Applications, Normal subgroups – Factor groups, Criteria for existing of a coset group ,Inner automorphism and normal subgroups ,Simple groups, The fundamental theorems of isomorphisms, applications	20
2	Definition and basic properties, Fields, Integral domains, divisors of zero andcancellation laws, The characteristic of a ring, some non commutative rings ,Examples, matrices over a field, The real quaternions, Homomorphism of ringsDefinition and elementary properties, Maximal and Prime ideals, Prime fields	16

Recommended Book:

John B Fraleigh , The first course in Abstract Algebra , Narosa publishing house.

Reference Books:

1. Joseph A Gallian, Contemporary Abstract Algebra , Narosa publishing house. PearsonEducation, Seventh Edition(2014).
- 2 I. N. Herstein, Topics in Algebra, *Wiley Eastern*. 1979.
3. V. K. Khanna, S. K. Bhambri, A Course in Abstract Algebra, Vikas Publishing House,PVT. LTD.,New Delhi.

B.Sc. III MATHEMATICS- CBCS
Semester: V Paper VI
Matrix Algebra and Numerical Methods-I (DSC -1003E2)
Theory: 72 Hours (96 lectures of 48 minutes) - Credits -4 (Marks-100)
Section I: Matrix Algebra

Course Outcomes:

After studying this course student will able to

CO1: Learn Terminologies related with matrices.

CO2: To solve system of homogeneous and non-homogeneous equations

CO3: Calculate eigen values and corresponding eigen vectors of square matrix

CO4: Calculate the translation, dilation, rotation of point, line and plane by using matrices

Unit	Contents	Hours Allotted
1	Translation, Dilation, Rotation, Reflection in a point, line and plane. Matrix form of basic geometric transformations. Interpretation of eigen values and eigen vectors for such transformations and eigen spaces as invariant subspaces. Types of matrices. Rank of a matrix. Invariance of rank under elementary transformations.	18
2	Reduction to normal form, Solutions of linear homogeneous and non-homogeneous equations with number of equations and unknowns upto four. Matrices in diagonal form. Reduction to diagonal form upto matrices of order 3. Computation of matrix inverses using elementary row operations. Rank of matrix. Solutions of a system of linear equations using matrices. Illustrative examples of above concepts from Geometry, Physics, Chemistry, Combinatorics and Statistics	18

Recommended Books:

1. A.I. Kostrikin, Introduction to Algebra, Springer Verlag, 1984.
2. S. H. Friedberg, A. L. Insel and L. E. Spence, Linear Algebra, Prentice Hall of India Pvt.Ltd., New Delhi, 2004.
3. Richard Bronson, Theory and Problems of Matrix Operations, Tata McGraw Hill, 1989.

Section II: Numerical Methods-I

Course Outcomes:

After studying this course student will able to

CO1: Use approximate numerical methods and determine the solutions to give non-linear equations

CO2: Use appropriate numerical methods and determine approximate solutions to systems of linear equations and ordinary differential equations.

CO3: Learn numerical methods to calculate eigen value

CO4: Learn numerical method to find solution of system of equations

Unit	Content	Hours Allotted
1	Introduction: Polynomial equations, algebraic equation and their roots, iterative methods, Bisection method, algorithm, examples, Secant method: iterative sequence of secant method, examples, Regula-Falsi method: algorithm, graphical representation, examples. Newton's method: algorithm, examples. Introduction: System of linear equations as a vector equation $Ax = b$, Augmented matrix. Direct methods: Gauss elimination method: Procedure, examples, Gauss-Jordan method: Procedure, examples. Iterative methods: General iterative rule	18
2	Jacobi iteration scheme, examples. Gauss-Seidel method: Formula, examples. Eigen values and eigenvectors of a real matrix, Power method for finding an eigen value of greatest modulus, the case of matrix whose dominant eigenvalue is not repeated, examples. Method of exhaustion, examples, Method of reduction, examples. Shifting of the eigen value, examples	18

Recommended Book:

Devi Prasad, An Introduction to Numerical Analysis (Third Edition), Narosa Publishing House.

Reference Books:

1. S. S. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall of India.
2. J. H. Mathews, Numerical Methods for Mathematics, Science and Engineering, Prentice Hall of India.
3. K. SankaraRao, Numerical Methods for Scientists and Engineers, , Prentice Hall of India.
4. Bhupendra Singh, Numerical Analysis, Pragati Prakashan.

B.Sc. III MATHEMATICS CBCS

Semester: VI Paper VIII

Metric Spaces and Linear Algebra (DSC -1003 F1)

Theory: 72 Hours (96 lectures of 48 minutes) - Credits -4 (Marks-100)

Section I: Metric Spaces

Course Outcome:

After studying this course student will able to

CO1: Learn Metric spaces and its different types.

CO2: Apply the notion of metric space to continuous functions on metric spaces

CO3: Demonstrate the properties of continuous function on metric space

CO4: Understand the basic concepts of connectedness, completeness and compactness of metric space.

Unit	Content s	Hours Allotted
1	Definition and examples of metric spaces. Open ball. Open set. Closed sets complement of open set. Interior point and interior of a set. Limit point and closure of a set. Boundary point and boundary of a set. Properties of interior, closure and boundary. Bounded set and diameter of a set. Distance between two sets. Subspace of a metric space. Convergent sequence. Cauchy sequence. Every convergent sequence is Cauchy and bounded, but the converse is not true. Completeness. Cantor's intersection theorem. \mathbb{R} is a complete metric space. \mathbb{Q} is not complete	18
2	Continuous mappings, sequential criterion of continuity. Uniform continuity. Compactness, Sequential compactness, Heine-Borel theorem in \mathbb{R} . Finite intersection property, continuous functions on compact sets. Concept of connectedness and some examples of connected metric space, connected subsets of \mathbb{R} , \mathbb{C} . Contraction mappings, Banach Fixed point Theorem and its application to ordinary differential equations.	18

Recommended Book: Satish Shirali and Harikishan L. Vasudeva, Metric Spaces, SpringerVerlag, London, 2006.

Reference Books:

- [1] S. Kumaresan, *Topology of Metric Spaces*, 2nd Ed., Narosa Publishing House, 2011.
- [2] P. K. Jain and K. Ahmad, *Metric Spaces*, Narosa Publishing House.
- [3] G.F. Simmons, *Introduction to Topology and Modern Analysis*, McGraw-Hill, 2004. T. M. Apostol, *Calculus* (Vol. I), John Wiley and Sons (Asia) P. Ltd., 2002.

Section II: Linear Algebra

Course Outcome:

After studying this course student will able to

CO1: Understand the concept of Vector spaces and operators on them.

CO2: Learn properties of Inner product spaces

CO3: Learn basic concept of linear transformation, dimension theorem

CO4: Familiarize characteristic roots and characteristic vectors.

Unit	Contents	Hours Allotted
1	Vector spaces, General properties of vector spaces, Vector subspaces, Algebra of subspaces, linear combination of vectors, Linear span, linear sum of two subspaces .Linear dependence and independence of vectors, Basis of vector space Finite dimensional vector space, Dimension of a vector space, Dimension of subspace, Linear transformations, linear operators, Range and null space of linear transformation, Rank and nullity of linear transformation, Linear transformations as vectors product of linear transformations, Invertible linear transformation.	18
2	The adjoint or transpose of a linear transformation ,Sylvester's law of nullity, characteristic values and vectors of linear transformation, Cayley -Hamilton theorem, Diagonalisable operators, Inner product spaces, Euclidean and unitary, Norm or length of vector, Schwartz inequality, Orthogonality, Orthonormal set,complete orthonormal set Gram - Schmidt orthogonalisation process.	18

Recommended Book:

J. N.Sharma and A .R. Vasistha , Linear Algebra, Krishna Prakashan mandir Meerut - 250002

Reference Books:

1. Kenneth Hoffman and Ray Kunze, Linear Algebra, Pearson Education, New Delhi.
2. Stephen H. Friedberg , Linear Algebra , Prentice Hall of India Pvt. Ltd. 4th edition 2007.

B.Sc. III MATHEMATICS- CBCS
Semester: V Paper VII
Complex Analysis and Numerical Methods-II (DSC -1003F2)
Theory: 72 Hours (96 lectures of 48 minutes) - Credits -4 (Marks-100)

Section I: Complex Analysis

Course Outcomes:

After studying this course student will be able to

CO1: Familiarize with Basic concepts of functions of theory of functions of complex variable.

CO2: Learn Differentiation and Integration of complex valued functions

CO3: Apply Cauchy integral formula to calculate integrals

CO4: Represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and evaluate complex integrals using the residue theorem.

Unit	Content s	Hours Allotted
1	Basic algebraic and geometric properties of complex numbers, Function of complex variable, Limits, continuity and differentiation, Cauchy Riemann equations, Analytic functions and examples of analytic functions, Exponential function, Logarithmic function, Trigonometric function, Definite integrals of functions, Contours, Contour integrals and its examples, upper bounds for moduli of contour integrals, Cauchy integral formula and examples.	18
2	Convergence of sequences and series of complex variables, Taylor series and its examples, Laurent series and its examples, absolute and uniform convergence of power series, Isolated singular points, Residues, Cauchy's residue theorem, Residue at infinity, The three types of isolated singularities, Residues at poles and examples, Zeros of analytic functions, Zeros and poles, Application of residue theorem to evaluate real integrals	18

Recommended Books:

James Ward Brown and Ruel V. Churchill, Complex Variables and Applications, 8th Ed., McGraw - Hill Education (India) Edition, 2014. Eleventh reprint 2018.

Reference Books:

1. S.Ponnusamy, Foundations of Complex Analysis, Narosa Publishing House, Second Edition, 2005, Ninth reprint 2013.
2. Lars V Ahlfors, Complex Analysis, McGraw-Hill Education; 3 edition (January 1, 1979).
3. S.B.Joshi, T.Bulboaca and P.Goswamy, Complex Analysis, Theory and Applications, DeGruyter, Germany (2019).

Section II: Numerical Methods-II

Course Outcomes:

After studying this course student will able to

CO1: Use appropriate numerical methods to evaluate the integration

CO2: Demonstrate the use of interpolation methods to find intermediate values in given graphical and/or tabulated data for unequally spaced data

CO3: Demonstrate the use of interpolation methods to find intermediate values in given graphical and/or tabulated data for equally spaced data

CO4: Learn to find the solutions of ordinary differential equations by Euler, Taylor and Runge Kutta Method.

Unit	Contents	Hours Allotted
1	Forward interpolation: Newton's forward differences, forward difference table. Newton's forward form of interpolating polynomial (formula only), examples. Backward interpolation: Newton's backward differences, backward difference table, Newton's backward form of interpolating polynomial (formula only), examples Introduction, Lagrangian interpolating polynomial(formula only), examples, Divided difference interpolation:, Newton's divided differences, divided difference table, examples finding divided (differences of given data),Newton's divided difference form of interpolating polynomial, examples	18
2	Numerical differentiation based on interpolation polynomial.Numerical integration:Newton-Cotes formula (statement only), Basic Trapezoidal rule (excluding the computation of error term), composite Trapezoidal rule, examples, Basic Simpson's 1/3rd rule (excluding the computation of error term), composite Simpson's 1/3rd rule, examples, Basic Simpson's 3/8th rule (excluding the computation of error term), composite Simpson's 3/8th rule, examples. Euler's Method, Examples, Second order Runge-Kutta method (formula only), examplesFourth order Runge-Kutta method (formula only), examples	18

Recommended Book:

Devi Prasad, An Introduction to Numerical Analysis (Third Edition), Narosa Publishing House.

Reference Books:

1. S. S. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall of India.
2. J.H. Mathews, Numerical Methods for Mathematics, Science and Engineering, Prentice Hall of India.

3. K. SankaraRao, Numerical Methods for Scientists and Engineers, , Prentice Hall of India.

**Skill Enhancement
Course SEC-SE
Programming in C++**

List of hands on examples (using C++)

1. Calculate the sum $1+2+3+\dots+n$
2. Enter 100 integers into an array and sort them in an ascending order.
3. HCF and LCM of three positive integers.
4. Separate even and odd numbers from first N natural numbers.
5. Find all the prime numbers between 1 and N (N being a positive integer).
6. Find the binary representation of a decimal number (up to 3 digits).
7. Addition , subtraction, multiplication of two matrices (order up to 4×4).
8. Compute the value of the determinant of a square matrix (order up to 4×4).

References

- [1] Arnold Robbins, Linux Programming by Examples The Fundamentals, 2nd Ed., Pearson Education, 2008.
- [2] Cox K, Red Hat Linux Administrator's Guide, PHI, 2009.
- [3] R. Stevens, UNIX Network Programming, 3rd Ed., PHI, 2008.
- [4] Sumitabha Das, UNIX Concepts and Applications, 4th Ed., TMH, 2009.

SEC-SF

Transportation problem and its mathematical formulation

Northwest-corner method, least cost method and Vogel approximation method for determination of starting basic solution, algorithm for solving transportation problem, assignment problem and its mathematical formulation, Hungarian method for solving assignment problem.

Game theory: formulation of two person zero sum games, solving two person zero sum games, games with mixed strategies, graphical solution procedure.

Books Recommended:

1. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, Linear Programming and Network Flows, 2nd Ed., John Wiley and Sons, India, 2004.
2. F. S. Hillier and G. J. Lieberman, Introduction to Operations Research, 9th Ed., Tata McGrawHill, Singapore, 2009.
3. Hamdy A. Taha, Operations Research, An Introduction, 8th Ed., Prentice-Hall India, 2006.

Core Course Practical In Mathematics (CCPM-VI)
Operational
Research (Marks 50)
credits 04

Sr. No.	Title of the experiment	Sessions
1	Graphical method for linear programming problems	1
2	Transportation Problems[North west corner rule]	1
3	Transportation Problems[Lowest Cost Entry Method]	1
4	Transportation Problems[Vogel Approximation Method]	1
5	Transportation Problems[Test for Optimality MODI method]	1
6	Assignment Problems [Hungarian Method]	1
7	Assignment Problems [Maximization Case]	1
8	Assignment Problems[Travelling Salesman Problem]	1
9	Assignment Problems[Unbalanced Problem]	1
10	Two by two (2 X 2) games without saddle point.	1
11	Algebraic method of Two by two (2 X 2) games.	1
12	Arithmetic method of Two by two (2 X 2) games.	1
13	Graphical method for 2 x n games and m x 2 games.	1
14	Processing n jobs through 2 machines.	1
15	Processing n jobs through 3 machines.	1
16.	Processing 2 jobs through m machines. Processing n jobs through m machines.	1
	Total	16

Core Course Practical In Mathematics (CCPM-III)
Numerical Methods
(Marks 50) credits 04

Sr. No.	Title of the experiment	Sessions
1	Bisection Method	1
2	Secant Method	1
3	Newton's method	1
4	Gauss elimination method	1
5	Gauss-Jordan method	1
6	Jacobi iteration scheme	1
7	Gauss-Seidel method	1
8	Power method	1
9	Newton's forward interpolation	1
10	Newton's backward interpolation	1
11	Lagrangian interpolation	1
12	Divided difference interpolation	1
13	Trapezoidal rule	1
14	Simpson's 1/3rd rule	1
15	Second order Runge-Kutta method	1
16.	Fourth order Runge-Kutta method	1
		16

RECOMMENDED BOOKS:

1. An Introduction to Numerical Analysis (Third Edition), Devi Prasad, Narosa Publishing House.
2. Introductory Methods of Numerical Analysis, S. S. Sastry, Prentice Hall of India.
3. Numerical Methods for Mathematics, Science and Engineering, J. H. Mathews, Prentice Hall of India.
4. Numerical Methods for Scientists and Engineers, K. Sankara Rao, Prentice Hall of India.
5. Numerical Analysis, Bhupendra Singh, Pragati Prakashan.

Core Course Practical In Mathematics (CCPM-V)

**Numerical Methods
(Marks 50) credits 04**

Sr. No.	Title of the experiment	Sessions
1	Bisection Method	1
2	Secant Method	1
3	Newton's method	1
4	Gauss elimination method	1
5	Gauss-Jordan method	1
6	Jacobi iteration scheme	1
7	Gauss-Seidel method	1
8	Power method	1
9	Newton's forward interpolation	1
10	Newton's backward interpolation	1
11	Lagrangian interpolation	1
12	Divided difference interpolation	1
13	Trapezoidal rule	1
14	Simpson's 1/3rd rule	1
15	Second order Runge-Kutta method	1
16.	Fourth order Runge-Kutta method	1
		16

RECOMMENDED BOOKS:

1. An Introduction to Numerical Analysis (Third Edition), Devi Prasad, Narosa Publishing House.
2. Introductory Methods of Numerical Analysis, S. S. Sastry, Prentice Hall of India.
3. Numerical Methods for Mathematics, Science and Engineering, J. H. Mathews, Prentice Hall of India.
4. Numerical Methods for Scientists and Engineers, K. Sankara Rao, Prentice Hall of India.
5. Numerical Analysis, Bhupendra Singh, Pragati Prakashan.

Core Course Practical In Mathematics (CCPM-VI)
Mathematical Computation Using
Python(Marks 50) credits 04

Sr. No.	Title of the experiment	Sessions
1	Introduction to Python	1
2	Expression and operators	1
3	Conditional statements	1
4	Looping and control statements	1
5	Functions	1
6	Modules and packages in Python	1
7	Python Data Structure	1
8	Operation on sets and array	1
9	System of linear algebraic equations	1
10	Roots of equations	1
11	Initial value problem	1
12	Magic square and Area calculation without measurement	1
13	Graph Theory: Network	1
14	Collaz conjecture and Monte Hall problem	1
15	Data compressing using Numpy	1
16.	Data visualization in Python	1
		16

RECOMMENDED BOOKS:

1. Jaan Kiusalaas, Numerical Methods in Engineering with Python3, Cambridge University Press.
2. Amit Saha, Doing Math with Python, No Starch Press, 2015.
3. Yashwant Kanetkar and Aditya Kanetkar, Let Us Python, BPB Publication, 2019.

Core Course Practical In Mathematics (CCPM-VII)

**Project, Study-Tour, Seminar, Viva-
Voce(Marks 50) credits 04**

A :PROJECT [30 Marks]

Project should be based on Mathematical modeling, Concepts and History of Mathematics, Mathematicians or any other relevant subjects.

B. STUDY TOUR [05 Marks]

It is expected that the tour should contain at least renown academic institution so that the visiting students will be inspired to go for higher studies in Mathematics

C. VIVA-VOCE (on the project report). [15 Marks]

SCHEME OF MARKING (THEROY)

Sem.	DSC	Marks	Evaluation	Sections	Answer Books	Standard of passing
V	1003E1	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28 marks)
	1003E2	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28 marks)
VI	1003F1	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28marks)
	1003F2	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28marks)

SCHEME OF MARKING (CIE) Continuous Internal Evaluation

Sem.	DSC	Marks	Evaluation	Sections	Answer Books	Standard of passing
V	1003E1	20	Concurrent	-	As per Instruction	35% (7 marks)
V	1003E2	20	Concurrent	-	As per Instruction	35% (7 marks)
VI	1003F1	20	Concurrent	-	As per Instruction	35% (7 marks)
VI	1003F2	20	Concurrent	-	As per Instruction	35% (7 marks)

SCHEME OF MARKING (PRACTICAL)

Sem.	DSC	Marks	Evaluation	Sections	Standard of passing
V AND VI	CCPM IV	50	Annual	As per Instruction	35% (18 marks)
	CCPM V	50	Annual	As per Instruction	35% (18 marks)
	CCPM VI	50	Annual	As per Instruction	35% (18 marks)
	CCPM VII	50	Annual	As per Instruction	35% (18 marks)

***A separate passing is mandatory**

Nature of Theory Question Paper

Instructions: 1) All the questions are *compulsory*.

2) Answers to the two sections should be written in **same** answer book.

3) Figures to the right indicate **full** marks.

4) Draw neat labeled diagrams *wherever* necessary.

5) Use of log table/calculator is allowed.

SECTION-I

Time : 2 hours

Marks: 40

Total

Q.1. Choose correct alternative.

8

i)

A)

B)

C)

D)

ii)

A)

B)

C)

D)

iii)

A)

B)

C)

D)

iv)

v)

A)

B)

C)

D)

vi)

A)

B)

C)

D)

vii)

A)

B)

C)

D)

viii)

A)

B)

C)

D)

A)
Q.2. Attempt any two.

B)

C)

D)

16

A)

B)

C)

Q.3. Attempt any four.

16

a)

b)

c)

d)

e)

f)

“Dissemination of Education for Knowledge, Science and Culture”

- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF COMPUTER SCIENCE

B.Sc. Part - III

Semester-V & VI

SYLLABUS

Under Choice Based Credit System

to be implemented from Academic Year 2020-21

STRUCTURE OF COURSE

Sr. No	Paper	Name of Paper	Marks	Internal Assessment	Credits
SEMESTER-V					
(DSE) Discipline Specific Electives					
1	DSE-1006E1	Section-I Computer Network	80	20	4
		Section-II Software Engineering			
2	DSE-1006E2	Section-I Internet Technologies-I	80	20	4
		Section-II Introduction to Java			
3	SEC-1006C	PHP Programming			2
4	AECC	English	50		4
SEMESTER-VI					
(DSE) Discipline Specific Electives					
5	DSE-1006F1	Section-I Advanced Computer Network	80	20	4
		Section-II Object Oriented Software Engineering			
6	DSE-1006F2	Section-I Internet Technologies-II	80	20	4
		Section-II Data Science using Python			
8	SEC-1006D	Advanced PHP Programming			2
9	AECC	English	50		4
10	Practical Paper -I	Practical's based on DSE-1006E1, DSE-1006E2, SEC-1006C	50		4
11	Practical Paper -II	Practical's based on DSC-1006F1, DSC-1006F2, SEC-1006D	50		
12	Project	Major Project	80		4
13	Study Tour/Field Visit	Study Tour/Field Visit		20	

B. Sc. Part – III CBCS
Semester - V Paper- V
Computer Network and Software Engineering
(DSC -1006 E1)

Theory: 72 Hours (90 lectures of 48 minutes) Credits -4 (100 Marks)

Expected Course Outcomes of this course

CO1: Students should be able to learn the basic Computer Network and Software engineering concepts.

CO2: Students should learn and understand various OOSE concepts along with their applicability contexts.

CO3: Students can learn the concepts, methods and techniques necessary to efficiently capture software

CO4: requirements in use cases and transform them into detailed designs.

CO5: Students should able to develop models using the UML notation

CO6: Students will analyze requirements with use cases and apply an iterative, agile process.

Section-I : Computer Network

Unit	Syllabus	Lectures
Unit I	Basic concepts: Components of data communication, standards and organizations, Network Classification, Network Topologies ; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite. Network Security : Common Terms, Firewalls, Virtual Private Networks	10
Unit II	ISO/OSI Model: Physical Layer: Cabling, Network Interface Card, Transmission Media Devices- Repeater, Hub, Bridge, Switch, Router, Gateway. Data Link Layer: Framing techniques; Error Control; Flow Control Protocols; Shared media protocols - CSMA/CD and CSMA/CA. Network Layer: Virtual Circuits and Datagram approach, IP addressing methods – Subnetting; Routing Algorithms (adaptive and non-adaptive) Transport Layer: Transport services, Transport Layer protocol of TCP and UDP Application Layer: Application layer protocols and services – Domain name system, HTTP, WWW, telnet, FTP, SMTP.	10
Unit III	Introduction to Linux Server Administration: Technical Summary of Linux Distributions, Managing Software Single-Host Administration: Managing Users and Groups, Booting and shutting down processes, File Systems, Core System Services, Process of configuring, compiling, Linux Kernel.	10

Section-II : Software Engineering

Unit	Syllabus	Lectures
Unit I	<p>Introduction to System Analysis: Definition of system, elements and characteristics of system, Types of system</p> <p>Software Engineering Concepts: Requirement analysis, System Design, Object Design, Participants and roles: System analyst, Characteristics of software, System Development Life Cycle (SDLC), Classical model, Water fall model, Feasibility study, Fact finding technique.</p>	10
Unit II	<p>Software Engineering: Definition, Modelling, Problem Solving, Knowledge acquisition, Rationale Driven.</p> <p>Software Project Management: Estimation in Project Planning Process, Project Scheduling.</p> <p>Quality Management: Quality Concepts, Software Qualities, Software Quality Assurance, Software Reviews, Metrics for Process and Projects.</p> <p>Risk Management: Software Risks, Risk Identification, Risk Projection and Risk Refinement.</p>	10
Unit III	<p>Software Testing: White Box Testing, Black Box Testing, Alpha Testing, Beta Testing, Change Over.</p> <p>Case studies: College Admission system, Library system, Bank management System.</p>	10

Text books/Reference Books:

1. A.S.Tanenbaum, "Computer Networks", Pearson Education, Fourth Edition.
2. Software Engineering by Pressman.
3. Object Oriented Software Engineering by Ivar Jacobson.

**B. Sc. Part – III CBCS
Semester - V Paper- VI**

**Internet Technologies – I and Introduction to JAVA
(DSC -1006 E2)**

Theory: 72 Hours (90 lectures of 48 minutes) Credits -4 (100 Marks)

Expected Course Outcomes of this course

CO1: Students will be known the basics Java Programming Language.

CO2: Students will be known the basics Object Oriented Concepts.

CO3: Students will be known about java concepts like interfaces, exception handling.

CO4: Students will be known to design and develop small java applications.

Section-I : Internet Technologies – I

Unit	Syllabus	Lectures
Unit I	Introduction to Flask: Flask as Micro Framework, Characteristics, Who uses Flask, Setup tools and pip (Installing Python, Installing Flask), working with virtualenv (Creating new VE, Activating and Deactivating VE, Adding and Removing packages to-from VE), Introduction to IDE (PyCharm, PyDev), Application Structure (Initialization, Routes and View Functions, Server Startup, The Request-Response Cycle, Application and Request Contexts, Request Dispatching, Request Hooks, Responses, Command-Line Options with Flask-Script), First Simple Application	10
Unit II	Jinja Templating: The Jinja2 Template Engine, Rendering Templates, Comments, Variables, Control Structures, Filters, Templates with include and Inheritance, Twitter Bootstrap Integration with Flask- Bootstrap, Custom Error Pages, Links, Static Files	10
Unit III	Creating and Rendering Forms: Cross-Site Request Forgery (CSRF) Protection, Form Classes, HTML Rendering of Forms, Form Handling in View Functions, Redirects and User Sessions, Message Flashing, Validating Fields on the server side, Creating custom fields and validation.	10

Section-II: Introduction to JAVA

Unit	Syllabus	Lectures
Unit I	Introduction to Java and Java Fundamentals: History of Java , Features of Java , Comparison of Java and C++ , Java Environment, Java Tools – jdb, javap, javadoc ,Java IDE – Eclipse/NetBeans, Structure of java program, ,First java program, Types of Comments, Data types, Variables, Operators, Keywords, Naming Convention, Declaring 1D, 2D array, Decision Making (if, switch), Looping(for, while) ,Type Casting , Accepting input using Command line argument, Accepting input from console	10

Unit II	Object, Classes and Inheritance in Java: Defining Your Own Classes, Access Specifiers (public, protected, private, default), Array of Objects , Constructor, Overloading Constructors and use of ‘this’ Keyword, static block, static Fields and methods, Object class methods, String Class, Inner class, Packages, Wrapper Classes , Garbage Collection, Memory allocation for objects, Constructor, Implementation of Inheritance, use of super keyword, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes, Use of final keyword related to method and class, abstract class and abstract methods, Defining and Implementing Interfaces, Object Cloning	10
Unit III	Exception Handling, GUI components using AWT and Swing and Applets: Exception types, Using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions, Assertions, Basics of AWT and Swing, their Difference, Layout Manager, Layouts, Components: JButton, JLabel, JText, JTextArea, JCheckBox and JRadioButton, JList, JComboBox, JMenu and JPopupMenu Class, JMenuItem and JCheckBoxMenuItem, JRadioButtonMenuItem, JScrollBar, Dialogs (Message, confirmation, input), JFileChooser, JColorChooser, Event Handling: Event sources, Listeners Mouse and Keyboard Event Handling, Adapters, Applet Life Cycle , appletviewer tool, Applet HTML Tags, Passing parameters to Applet , repaint() and update() method	10

Text books/ Reference Books:

1. Learn Web Development with Python by Fabrizio Romano, Gaston C. Hillar, Arun Ravindran, Packt Publishing, ISBN: 9781789953299, 2018
2. Django for Beginners: Build websites with Python and Django Paperback – March 7, 2018 by William S. Vincent.
3. Core Java2 Volume I-Fundamentals by Cay S. Horstmann, Gary Cornell
4. Effective Java Programming Language Guide by Joshua Bloch
5. Herbert Schildt , Java 7, The Complete Reference, , 8th Edition, 2009
6. Java 2 programming black books, Steven Horlzner
7. Programming with Java , A primer ,Forth edition , By E. Balagurusamy

B. Sc. Part – III CBCS
Semester - V Paper- III
PHP Programming
(SEC -1006 C)
Credits -2 (50 Marks)

Expected Learning Outcomes of this course

1. Students will be knowing basics PHP programming Language.
2. Students will be getting the primer knowledge of web application development frameworks.
3. Students will be known about internet techniques.
4. Students should be able to design and develop web applications.

Unit	Syllabus
Unit I	<p>Introduction: PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.), PHP with other technologies, scope of PHP, Basic Syntax, PHP variables and constants ,Types of data in PHP , Expressions, scopes of a variable (local, global), Operators: Arithmetic, Assignment, Relational , Logical operators, Bitwise, ternary and MOD operator, PHP operator Precedence and associativity Control Structure: PHP IF Else conditional statements (Nested IF and Else), Switch case, while, For and Do While Loop, Goto, Break, Continue and exit</p>
Unit II	<p>String and Regular Expression: Creating and accessing String , Searching & Replacing String , Formatting, joining and splitting String , String Related Library functions , Use and advantage of regular expression over inbuilt function ,Use of preg_match(), preg_replace(), preg_split() functions in regular expression Arrays: Anatomy of an Array, Creating index based and Associative array, Accessing array, Looping with Index based array, with associative array using each() and foreach(). Functions: Need of Function, declaration and calling of a function , PHP Function with arguments, Default Arguments in Function, Function argument with call by value, call by reference, Scope of Function Global and Local. Files: Working with files and directories Directories: Getting File Information, Changing File Permissions, Splitting a Filename into Its Component Parts, Deleting, Copying or Moving a File, Processing All Files in a Directory, Getting a List of Filenames Matching a Pattern, Processing All Files in a Directory Recursively, Making, Removing a Directory and Its Contents</p>

Text book:

1. PHP Cookbook by David Sklar & Adam Trachtenberg

Additional References:

1. PHP & MySQL for Dummies by Janet Valade
2. PHP and MySQL Web Development by Luke Welling, Laura Thompson
3. Programming PHP by Rasmus Lerdorf, Kevin Tatroe

**B. Sc. Part – III CBCS
Semester - VI Paper- VII**

**Advanced Computer Network and Object Oriented Software Engineering
(DSC -1006F1)**

Theory: 72 Hours (90 lectures of 48 minutes) Credits -4 (100 Marks)

Expected Course Outcomes of this course

CO1: Students should be able to learn the basic Computer Network and Software engineering concepts.

CO2: Students should learn and understand various OOSE concepts along with their applicability contexts.

CO3: Students can learn the concepts, methods and techniques necessary to efficiently capture software requirements in use cases and transform them into detailed designs.

CO4: Students should be able to develop models using the UML notation

CO5: Students will analyze requirements with use cases and apply an iterative, agile process.

Section-I : Advanced Computer Network

Unit	Syllabus	Lectures
Unit I	Networking and Security: TCP/IP for System Administrators, basic network Configuration, Linux Firewall (Netfilter), System and network security	10
Unit II	Internet Services: Domain Name System (DNS), File Transfer Protocol (FTP), Apache web server, Simple Mail Transfer Protocol (SMTP), Post Office Protocol and Internet Mail Access Protocol (POP and IMAP), Secure Shell (SSH), Network Authentication, OpenLDAP Server, Samba and LDAP, Network authentication system (Kerberos), Domain Name Service (DNS), Security.	10
Unit III	Intranet Services: Network File System (NFS), Samba, Distributed File Systems (DFS), Network Information Service (NIS), Lightweight Directory Access Protocol (LDAP), Dynamic Host Configuration Protocol (DHCP), MySQL, LAMP Applications File Servers, Email Services, Chat Applications, Virtual Private Networking.	10

Section-II : Object Oriented Software Engineering

Unit	Syllabus	Lectures
Unit I	Introduction to OOAD: Object Oriented Concepts and Modelling: Introduction to class, Object, inheritance, polymorphism, Aggregation and Composition. Introduction to UML: Overview, Conceptual Model of UML, UML architecture.	10

Unit II	Unified Process Model Views, UML Diagrams: Class diagrams, Object diagrams, Statechart diagram. Static Modelling Notation: Package Diagrams, Composite Structures, Component Diagrams, Deployment Diagrams Dynamic Modelling Notation: Use Case Diagrams, Activity Diagrams, Interaction Diagrams	10
Unit III	Mapping Object Model to Database Schema: Object Oriented Design: System Design process, Partitioning the analysis model, Concurrency and subsystem allocation, Task, Data and Resource management. Object Oriented Analysis: Iterative Development, Unified process & UP Phases: Inception, Elaboration, Construction and Transition. Object Oriented Testing: Types of Testing, Object oriented Testing strategies, Test case design for OO software	10

Text books/ Reference Books:

1. Software Engineering by Pressman.
2. Object Oriented Software Engineering by Ivar Jacobson.
3. The Unified Modeling Language User Guide by Grady Booch, James Raumbaugh, Ivar Jacobson.
4. Applying UML and Patterns by Craig Larman

B. Sc. Part – III CBCS
Semester - VI Paper- VIII
Internet Technologies – II and Data Science using Python
(DSC -1006F2)

Theory: 72 Hours (90 lectures of 48 minutes) Credits -4 (100 Marks)

Expected Course Outcomes of this course

- CO1:** To demonstrate proficiency with statistical analysis of data.
CO2: To develop the ability to build and assess data-based models.
CO3: To apply data science concepts and methods to solve problems in real-world contexts and will communicate these solutions effectively.
CO4: Apply Machine Learning Algorithms to build machine intelligence.

Section-I : Internet Technologies – II

Unit	Syllabus	Lectures
Unit I	Working with Databases: SQL Databases, NoSQL Databases, SQL or NoSQL? Python Database Frameworks, Database Management with Flask-SQLAlchemy, Model Definition, Relationships, Database Operations ,Creating the Tables, Inserting Rows, Modifying Rows, Deleting Rows, Querying Rows, Database Use in View Functions, Integration with the Python Shell.	10
Unit II	User Authentication: Authentication Extensions for Flask ,Password Security ,Hashing Passwords with Werkzeug ,Creating an Authentication Blueprint, User Authentication with Flask-Login, Preparing the User Model for Logins, Protecting Routes, Adding a Login Form, Signing Users In, Signing Users Out, Understanding How Flask-Login Works, Testing Logins, New User Registration, Adding a User Registration Form, Registering New Users ,Account Confirmation , Generating Confirmation Tokens with itsdangerous, Sending Confirmation Emails, Account Management.	10
Unit III	Application Deployment: Deployment Workflow, Logging of Errors During Production, Cloud Deployment, The Heroku Platform, Preparing the Application, Testing with Heroku Local, Deploying with git push, Deploying an Upgrade, Docker Containers, Installing Docker, Building a Container Image, Running a Container.	10

Section-II : Data Science using Python

Unit	Syllabus	Lectures
Unit I	Introduction to Data Science: Definition, Big Data and Data Science hype, Getting past the hype, Datafication, History and Current landscape of perspectives, Drew Conway’s Venn diagram of data science, Roles and Skill sets of the Data Scientist in Data Science. Statistical Inference: Populations and samples of Big Data, Statistical Modeling, Probability Distributions, Fitting a Model. Introduction to Data Structures, Exploratory Data Analysis (EDA): The Data Science Process, Basic tools (plots, graphs and summary statistics) of EDA, Case Study: RealDirect (online real estate firm).	10

Unit II	Introduction to Machine Learning: Interpreting parameters, Confidence intervals, The role of explicit assumptions, Three basic Algorithms - Linear Regression: Fitting the model, Extending beyond least squares, Adding in modeling assumptions about the errors, Evaluation metrics(R-squared, p-values, Cross-validation), Transformations. k-Nearest Neighbors (k-NN): distance metrics(Cosine Similarity, Jaccard Distance, Mahalanobis Distance, Hamming Distance, Manhattan), Training and test sets, Choosing k, Binary Classes, Test Set in k-NN, modeling assumptions. k-means: Hierarchical modeling, 2D version, unsupervised learning.	10
Unit III	Advances in Data Science: Spam Filters, Naive Bayes, Bayes Law, Comparison between Naive Bayes to k-NN. Data Wrangling: APIs and other tools for scrapping the Web. Feature Selection (Extracting Meaning from Data), Feature Generation: (brainstorming, role of domain expertise and place for imagination), Feature Selection algorithms: (Filters, Wrappers, Decision Trees, Random Forests). Recommendation Systems: Problems with Nearest Neighbors, Sensitivity of distance metrics, The Dimensionality Problem, Singular Value Decomposition (SVD), Properties of SVD, Dimensionality Reduction, Singular Value Decomposition, Principal Component Analysis (PCA).	10

Text books/ Reference Books:

1. Python 3 Web Development Guide, Michel Anders, Beginners guide, PACKT Publishing, open source
2. Doing Data Science by Rachel Schutt, Cathy O'Neil, Publisher: O'Reilly Media, Inc. 2014.
3. An Introduction to Statistical Learning by Gareth James (2017) Publisher: Springer
4. The Data Science Handbook by FIELD CADY, ISBN: 978-1-119-09294-0(2017), Publisher: Wiley

B. Sc. Part – III CBCS
Semester - VI Paper- IV
Advanced PHP Programming
(SEC -1006 D)

Credits -2 (50 Marks)

Expected Learning Outcomes of this course

- 1) Students should to learn the basic tags used in HTML.
- 2) Student should develop their own Cascading Sheets in order to design web pages.
- 3) Students should be able to develop Static web pages.

Unit	Syllabus
Unit I	<p>Classes and Objects: Instantiating Objects, Defining Object Constructors, Defining Object Destructors, Implementing Access, Preventing Changes to Classes and Methods, Defining Object Stringification ,Requiring Multiple Classes to Behave Similarly , Creating Abstract Base Classes, Assigning Object References, Cloning Objects, Overriding Property Accesses, Calling Methods on an Object Returned by Another Method, Aggregating Objects, Accessing Overridden Methods, Creating Methods Dynamically, Using Method Polymorphism, Defining Class Constants, Defining Static Properties and Methods, Controlling Object Serialization, Introspecting Objects, Checking If an Object Is an Instance of a Specific Class, Auto loading Class Files upon Object Instantiation, Instantiating an Object Dynamically</p> <p>Working with Forms: Processing Form Input, Validating Form Input: Required Fields, Numbers, Email Addresses, Drop-Down Menus, Radio Buttons, Checkboxes ,Dates and Times, Credit Cards ,Preventing Cross-Site, Processing Uploaded Files, Working with Multipage Forms ,Redisplaying Forms with Inline Error Messages, Guarding Against Multiple Submissions of the Same Form, Preventing Global Variable Injection Using Form Elements with Multiple Options</p>
Unit II	<p>Database Access: Using DBM Databases, Using an MySQL Database, Connecting to an MySQL Database, Querying an MySQL Database, Retrieving Rows Without a Loop, Modifying Data in an MySQL Database, Repeating Queries Efficiently, Finding the Number of Rows Returned by a Query, Escaping Quotes, Logging Debugging Information and Errors, Creating Unique Identifiers, Building Queries Programmatically, Making Paginated Links for a Series of Records, Caching Queries and Results, Accessing a Database Connection Anywhere in Program.</p> <p>Web Techniques: Setting Cookies, Reading Cookie Values, Deleting Cookies, Building a Query String, Reading the POST Request Body, Using HTTP Basic or Digest Authentication, Using Cookie Authentication, Reading an HTTP Header, Writing an HTTP Header, Sending a Specific HTTP Status Code, Redirecting to a Different Location, Flushing Output to the Browser Buffering Output to the Browser, Compressing Web Output</p> <p>Introduction to Web Development Frameworks: Laravel, Codeigniter, Joomla</p> <p>Case Studies: Building User Authentication and Personalization, Building a Shopping Cart, e-learning, e-shop</p>

Reference/Text books:

1. PHP Cookbook by David Sklar & Adam Trachtenberg
2. PHP & MySQL for Dummies by Janet Valade
3. PHP and MySQL Web Development by Luke Welling, Laura Thompson
4. Programming PHP by Rasmus Lerdorf, Kevin Tatroe

Semester V – Practicals

Practical's based on DSE-1006E1, DSE-1006E2, SEC-1006C

(Credits: 2, Pract/Week: 4)

COMPUTER NETWORK

1. Study of different types of Network cables and practically implement the cross-wired cable and straight through cable using clamping tool.
2. Study of Network Devices in Detail (Switch, Hub, Router etc.)
3. Study of Network IP.
4. Connect the computers in Local Area Network.
5. Study of basic network commands and Network configuration.
6. Configure a Network topology using packet tracer software.
7. Configure a Network topology using Distance Vector Routing protocol.
8. Configure a Network topology using Link State Vector Routing protocol.

SOFTWARE ENGINEERING

1. Development of SRS document, Design document for the case studies.
2. Development of DFD, data dictionary, E-R diagram, structured chart for the case studies.

INTRODUCTION TO JAVA

1. WAP to find the largest of n natural numbers.
2. WAP to find whether a given number is prime or not.
3. Write a menu driven program for following:
 - a. to display a Fibonacci series
 - b. to compute Factorial of a number
 - c. to check whether a given number is odd or even.
 - d. to check whether a given string is palindrome or not.
4. WAP to print the sum and product of digits of an Integer and reverse the Integer.
5. Write a program to create an array of 10 integers. Accept values from the user in that array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.
6. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.
7. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set.
8. Write java program for the following matrix operations:
 - a. Addition of two matrices
 - b. Summation of two matrices
 - c. Transpose of a matrix
 - d. Input the elements of matrices from user.
9. Write a java program that computes the area of a circle, rectangle and a Cylinder using

function overloading.

10. Write a Java for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle.
11. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window.
12. Write a program that reads two integer numbers for the variables a and b. If any other character except number (0-9) is entered then the error is caught by NumberFormatException object. After that ex.getMessage() prints the information about the error occurring causes.
13. Write a program for the following string operations:
 - a. Compare two strings
 - b. Concatenate two strings
 - c. Compute length of a string
14. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.

Semester VI – Practicals

Practical's based on DSC-1006F1, DSC-1006F2, SEC-1006D

(Credits: 2, Pract/Week: 4)

OBJECT ORIENTED SOFTWARE ENGINEERING

1. To study and draw various UML diagrams.
2. To illustrate the use of class diagrams.
3. To draw an activity diagram and use case diagram for ATM and Library Management System.
4. Draw Object Diagram for ATM System.
5. Development of State Transition Diagram.
6. Draw ER Diagram for Hospital Management System.

INTERNET TECHNOLOGY

1. Internet Technology
2. Create a webpage to display text
3. Create webpages using templates.
4. Demonstrate database connection in django platform
5. Demonstrate thread with example.
6. Demonstrate menus, toolbars, Drawings with django platform.
7. Demonstrate GET and POST method.
8. Create a web application for your college.
9. Create a web application for e-commerce

DATA SCIENCE

1. Importing Data with read_csv() in python.
2. Tutorial on Probability Distributions in Python.
3. Tutorial on Exploratory data analysis in Python.
4. Tutorial to learn the k-Nearest Neighbors algorithm in Python.
5. Tutorial to learn Distance Metrics in Machine Learning.

Evaluation Scheme

I. Internal Exam - Marks – 20 Marks for each paper

(i) Test – 10 Marks

10 marks Test – Duration 20 mins

It will be conducted either using any open source learning management system such as Moodle (modular object-oriented dynamic learning environment) or a test based on an equivalent online course on the contents of the concerned course(subject) offered by or build using MOOC (Massive Open Online Course) platform.

(ii) 10 Marks – Active participation in routine class instructional deliveries, Overall conduct as a responsible student, Organizing co-curricular activities etc.

II. External Exam - Marks –80 Marks for each paper

1. Duration - 3 Hours.

2. Theory question paper pattern:-

All questions are compulsory.

Question Based on Marks

Section-I

Q.1 Unit I [10]

Q.2 Unit II [15]

Q.3 Unit III [15]

Section – II

Q.1 Unit I [10]

Q.2 Unit II [15]

Q.3 Unit III [15]

All questions shall be compulsory with internal choice within the questions. Each Question may be sub divided into sub questions as a, b, c, d & e, etc & the allocation of Marks depends on the weightage of the topic.

III. Practical Exam – 100 (50+50) marks

(Certified Journal is compulsory for appearing for practical exam)

Practical's based on DSE-1006E1, DSE-1006E2, SEC-1006C– 40 marks + 5 marks (journal) + 5 marks (viva)

Practical's based on DSE-1006F1, DSE-1006F2, SEC-1006D – 40 marks + 5 marks (journal) + 5 marks (viva)

IV. Major Project – 80 marks

V. Study Tour/Field Visit – 20 marks

Nature of Question Paper

Instructions:

- 1) All the questions are **compulsory**.
- 2) Answers to the two sections should be written in **same** answer book.
- 3) Figures to the right indicate **full** marks.
- 4) Draw neat labeled diagrams **wherever** necessary.
- 5) Use of log table/calculator is allowed.

Time : 3 hours

Total Marks: 80

SECTION-I

Q.1. Choose correct alternative.

8

i)

A) B) C) D)

ii)

A) B) C) D)

iii)

A) B) C) D)

iv)

A) B) C) D)

v)

A) B) C) D)

vi)

A) B) C) D)

vii)

A) B) C) D)

viii)

A) B) C) D)

Q.2. Attempt any two.

16

A)

B)

C)

Q.3. Attempt any four.

16

a)

b)

c)

d)

e)

SECTION-II

Q.1. Choose correct alternative.

8

- i)
A) B) C) D)
- ii)
A) B) C) D)
- iii)
A) B) C) D)
- iv)
A) B) C) D)
- v)
A) B) C) D)
- vi)
A) B) C) D)
- vii)
A) B) C) D)
- viii)
A) B) C) D)

Q.2. Attempt any two.

16

- A)
- B)
- C)

Q.3. Attempt any four.

16

- a)
- b)
- c)
- d)
- e)

“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur
(Autonomous)**



DEPARTMENT OF CHEMISTRY

**B.Sc. Part-III
(Semester V, VI)**

SYLLABUS

**Under Choice Based Credit System
Syllabus with effect from the Academic Year 2020-21**

Course Structure

Class	Semester	Course Name	Name of the paper	Credits
B.Sc.-III	V	Chemistry (DSC)	1002E1-Physical & Inorganic Chemistry	4
			1002E2-Organic & Analytical Chemistry	4
			Chemistry Lab-V Practical	2
			Chemistry Lab-VI Practical	2
		Chemistry (SEC-SE)	Basic Analytical Chemistry	2
	VI	Chemistry (DSC)-III	1002F1-Physical & Inorganic Chemistry	4
			1002F2-Organic Spectroscopic techniques & Industrial Chemistry	4
			Chemistry Lab-VII Practical	2
			Chemistry Lab-VIII Practical	2
		Chemistry (SEC)-SF	Project work & Industrial study tour	2
Total Credits				28

B. Sc. Part-III CBCS
Semester-V
Chemistry-DSC-1002E1: Physical and Inorganic Chemistry
Theory: 60 Hrs (75 Lectures) Credits-4

Course Outcomes: After the completion of the course, the student will be able to:

- CO1 Understand the wave mechanics of atomic structure.
- CO2 Know the phenomenon related to the micro particle like electrons.
- CO3 Acquire the fundamentals behinds the spectroscopic techniques like Raman, electronics and vibrational spectroscopy.
- CO4 Adopt the basics of photochemistry, structure, defects in crystals and theory of the reaction rates.
- CO5 Describe the synthesis and applications of the semiconductors and superconductors in electrical and electronic devices.
- CO6 Impart essential knowledge regarding classification, types, mechanism and applications of catalyst in industrial fields.
- CO7 Improve the level of understanding of structure, method of preparation and applications of organometallic compounds in various fields.
- CO8 Gain thorough knowledge of role of various metals and nonmetals in our health.

Section-I: Physical Chemistry (38 Periods)

Units	Content	Periods
I	Quantum Theory Introduction, Dual nature of matter and energy: De Broglie hypothesis, The Heisenberg's uncertainty principle, Concept of energy operators (Hamiltonian), Derivation of Schrodinger wave equation, Physical interpretation of ψ and ψ^2 , Particle in a one-dimensional box, Schrodinger wave equation for hydrogen atom, Concept of quantum numbers.	10
II	Molecular Spectroscopy	12

	<p>Introduction, Electromagnetic radiations, Electromagnetic spectrum, Energy level diagram.</p> <p>Rotational spectra of diatomic molecules: Rigid rotor model, Moment of inertia (derivation expected), Energy levels of rigid rotor, selection rules, spectral intensity, Maxwell-Boltzmann population distribution, Determination of bond length, isotopic effect, interaction of radiation with rotating molecules.</p> <p>Vibrational spectra of diatomic molecules: Simple Harmonic oscillator model, vibrational energies of diatomic molecules, determination of force constant, overtones. Interaction of radiation with vibrating molecules.</p> <p>Raman Spectra: concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules.</p> <p>Numerical problems.</p>	
III	<p>Photochemistry</p> <p>Introduction - Difference between thermal and photochemical processes.</p> <p>Laws of photochemistry:</p> <ul style="list-style-type: none"> i) Grothus-Draper law ii) Lambert law iii) Lambert-Beer's law(with derivations) iv) Stark-Einstein law <p>Quantum yield, reasons for high and low quantum yield, Factors affecting Quantum yield, Photosensitized reactions-dissociation of H₂, photosynthesis, Photo-dimerization of anthracene, decomposition of HI and HBr, Photophysical and photochemical processes, Jablonaski diagram depicting various processes occurring in the excited state: Qualitative description of fluorescence and hosphorescence, Chemiluminescence, Electroluminescence, Numerical problems.</p>	8
IV	<p>Chemical Kinetics</p> <p>Introduction, Third order reactions: derivation of rate</p>	10

constant, characteristics and examples of third order reaction. Theories of reaction rate as Collision theory and transition state theory (only quantitative aspect). Simultaneous reactions such as: Opposing reactions: (Derivations of rate equation for first order opposed by first order, expected Numerical problems), side reaction, Consecutive reactions: (Derivation of rate equation).
--

Reference Books:

1. P.W. Atkins, The Elements of Physical Chemistry: 4th ed. Oxford University Press, 2005.
2. G.M. Barrow, Physical Chemistry: 6th Ed, Tata McGraw Hill Publishing Co. Ltd., 2008.
3. G.K. Vemulapalli, Physical Chemistry: Prentice Hall of India Pvt. Ltd., 2009 .
4. G.W. Castellan, Physical Chemistry: 3rd ed., Narosa Publishing House, 2004.
5. S. Glasstone, Text Book of Physical Chemistry, 2nded, Affiliated East-West press Pvt. Ltd., New Delhi.
6. K. J. Laidler and J. H. Meiser, Physical Chemistry: 2nd ed. CBS, First Indian ed.1999.
7. Ira N. Levine, Physical Chemistry: 6th ed., Tata McGraw Hill, Inc., 2011.
8. C. N. Banwell, Fundamentals of Molecular Spectroscopy, 5th ed., Tata McGraw Hill Publishing Co. Ltd, New Delhi,

Section II: Inorganic Chemistry (37 Periods)

Units	Content	Periods
I	<p>Solid State Chemistry</p> <p>Structures of Solids, Importance of solid state chemistry, Crystals: size and shape of crystals, interfacial angles in crystals, Designation of planes in crystals: Miller indices, Classification of solids on the basis of bonding, Explanation of terms viz. crystal lattice, lattice points, unit cells and lattice constants, Closest packing of rigid spheres (hcp, ccp) packing density in simple cubic, bcc, fcc and hcp lattices</p>	12

	(numerical problems expected), Structures of metallic solids, Tetrahedral and octahedral interstitial voids in ccp lattice, tetrahedral holes, Defects in crystal structures; effects of Schottky and Frenkel defects.	
II	Metals, Semiconductors and Superconductors Introduction, Properties of metallic solids, Theories of bonding in metal: i) Free electron theory ii) Molecular orbital theory (Band theory), Classification of solids as conductor, insulators and semiconductors on the basis of band theory, Semiconductors, Types of semiconductors - intrinsic and extrinsic semiconductors, Applications of Semiconductors, Superconductors: Superconductivity, Meissner effect, Ceramic superconductors-Preparation and structures of mixed oxide $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$, Applications of superconductors	8
III	Catalysis General principles and properties of catalysts, homogenous catalysis (catalytic steps and examples) and heterogeneous catalysis (catalytic steps and examples) and their industrial applications, Deactivation or regeneration of catalysts, Phase transfer catalysts, application of zeolites as catalysts.	6
IV	Organometallic Compounds Definition nomenclature and Classification of organometallic compounds, EAN rule as applied to carbonyls, Structures of methyl lithium, Zeiss salt and ferrocene, Preparation, structure, bonding and properties of mononuclear and polynuclear carbonyls of 3d metals.	6
V	Bio-Inorganic Chemistry Introduction, Essential and trace elements in biological process, Metalloporphyrin's with special reference to haemoglobin and myoglobin, Role of metal ions present in biological systems with special reference to Na^+ , K^+ , Mg^{2+} and Ca^{2+} ions, Na/K pump, Role of Mg^{2+} ions in energy production and chlorophyll, Role of Ca^{2+} in blood clotting, stabilization of protein structures and structural role (bones).	5

Reference Books:

1. Concise Inorganic Chemistry by J.D. Lee-5th Edition.

2. Inorganic Chemistry, - D.F. Shiver & P.W. Atkins- C.H. Longford ELBS- 2ndEdition.
3. Basic Inorganic Chemistry, - F.A. Cotton and G. Wilkinson, Wiley Eastern Ltd 1992.
4. Concept and Model of Inorganic Chemistry by Douglas-Mc Daniels - 3rdEdition.
5. Co-ordination Compounds by Baselo and Pearson
6. Inorganic Chemistry by J.E. Huheey, 4th Edition, Pearson Education.
7. Theoretical Inorganic Chemistry by Day and Selbin
8. Inorganic Chemistry by A. G. Sharpe - 3rdEdition
9. Principles of Bioinorganic Chemistry by S. J. Lippard and J. M. Berg, 1stEdition.
10. Advanced Inorganic Chemistry (4th Edition) Cotton and Wilkinson
11. Theoretical Inorganic Chemistry by Day and Selbine.
12. Organometallic Chemistry by R. C. Mahrotra A. Sing, Wiley Eastern Ltd. New Delhi.
13. Principles of Inorganic Chemistry by Puri, Sharma and Kalia, Vallabh Publication.
Pitampur Delhi.
14. Text book of Inorganic Chemistry by K. N. UpadhyayaVikas Publishing House - New Delhi.
15. Inorganic Solids: An introduction to concepts in solid-state structural chemistry by Adam, D.M. John Wiley & Sons, 1974.
16. Inorganic and Solid State Chemistry by Rodger, G.E. Cengage Learning India Edition, 2002.
17. B. K. Sharma: Engineering Chemistry, Goel Publishing House, Meerut

B. Sc. Part-III (Chemistry) CBCS
Semester -V
Chemistry-DSC-1002E2: Organic and Analytical Chemistry
Theory: 60 Hrs (75 Lectures) Credits-4

Course Outcomes: After the completion of the course, the student will be able to:

- CO1** Learn mechanism of different organic name reactions and to become confident to solve the problems based on the reactions.
- CO2** Adopt the utility of reagents in organic synthesis.
- CO3** Understand the fundamentals of terpenoids and alkaloids.
- CO4** Describe the applications of nucleophilic substitution reactions of aromatic compounds.
- CO5** Acquire the knowledge of pharmaceuticals and its use.
- CO6** Discuss the basic concepts of qualitative and quantitative analysis.
- CO7** Develop the skills of potentiometric, titrimetric, gravimetric and colorimetric analysis.
- CO8** Illustrate the separation techniques such as paper and thin layer chromatography.

Section I: Organic Chemistry (38 Lectures)

Units	Content	Periods
I	Name Reactions Beckmann, Benzylic acid, Baeyer Villiger, Diels -Alder reaction, Mannich Reaction, Michael Reaction, Fries, Dienone-Phenol rearrangement, Problems based on reactions.	9
II	Synthetic Reagents DDQ, OsO ₄ , N-bromosuccinamide, Zn-Hg, DCC, LiAlH ₄ , CAN, Raney Ni, Diazomethane.	9
III	Natural product A) Terpenoid: Introduction, Occurrence, Isolation, General	5

	<p>Characteristics, Classification, General Methods for structure determinations, Isoprene rule, Analytical evidences and synthesis of Citral.</p> <p>B) Alkaloids: Introduction, Occurrence, Isolation, Classification, Properties, General Methods for structure determinations, Analytical evidences and synthesis of Nicotine.</p>	
IV	<p>A) Electrophilic and nucleophilic substitution reactions of Aromatic Compounds</p> <p>Chemical properties of the following compounds with reference to electrophilic and nucleophilic substitution: Naphthalene, Furan, Pyrrole, Thiophene, and Pyridine.</p> <p>B) Active methylene compounds</p> <p>Preparation: Claisen ester condensation. Keto-enol tautomerism, Knoevenagel Condensation, Reactions: Synthetic uses of ethylacetoacetate, Malenitrile preparation of nonheteromolecules having upto 6 carbon).</p>	7
V	<p>A) Pharmaceuticals</p> <p>Introduction, importance, qualities of good drug, Meaning of the terms: analgesic, antipyretic, anaesthetics, antibiotics, anti-inflammatory, tranquilizer, antiallergic and cardiovascular, anti-hypertensive, anti-neoplastic, sedative and hypnotics. Synthesis and uses: Isoniazid, benzocaine, ethambutol, phenobarbitone, chloramphenicol, paludrine.</p> <p>B) Green Chemistry</p> <p>Introduction, Principles and Significance of green chemistry, Applications of microwaves and ionic liquids in chemical reactions.</p>	8

Reference Books:

1. Organic Chemistry by Morrison and Boyd 6th Edition.
2. Organic Chemistry, Pearson Education, 7th Edition, Tata McGraw Hill, 2008. by Francis A Carey,

3. A guide to mechanism in Organic Chemistry, 6th Edition, Pearson Education, New Delhi-Peter Sykes.
4. Organic Reaction Mechanism, 4th Edition, Narosa Publications. By V. K. Ahluwalia and R. K. Parashar.
5. Mechanism and Structure in Organic Chemistry. April, 1963 By Edwin S. Gould
6. A text book of Organic Chemistry by Arun Bahl, B. S. Bhal
Eighteenth Revised edition 2006.
7. Green Chemistry by V. K. Ahluwalia.
8. Medicinal chemistry A. Kar.
9. Medicinal chemistry Alka Gupta

Section II: Analytical Chemistry

(37 Lectures)

Units	Content	Periods
I	<p>Qualitative and Quantitative Aspects of Analysis</p> <p>General introduction, Sampling techniques of solid, liquid and gases; Types of errors, determinate and indeterminate errors, constant and proportionate errors, Accuracy and precision, measures of dispersion and central tendency: mean, median, average deviation, relative average deviation, standard deviation, variance, coefficient of variation, Numerical problems.</p>	6
II	<p>Titrimetric Analysis</p> <p>General Introduction, types of titrations,</p> <p>Acid-Base titrations: Neutralization Indicators (Acid-Base Indicators), Theory of indicators w.r.t. Ostwald's colour change interval and Ostwald's Quinoid theory, Construction of titration curves and choice of indicators in the titration of: (i) strong acid and strong base (ii) strong acid and weak base (iii) weak acid and strong base (iv) weak acid and weak base.</p> <p>Complexometric titrations: General introduction, types of EDTA titrations, metallochromic indicators w.r.t. Eriochrome Black-T.</p> <p>Redox titrations: General introduction, theory of redox indicators, Use of diphenyl amine and ferroin as redox indicators.</p>	8
III	<p>Gravimetric Analysis</p> <p>General Introduction, Common ion effect and solubility product principles, Conditions for good precipitation, qualities of good precipitate, Factors affecting precipitation like acid, temperature, nature of solvent, Super saturation and precipitate formation, Precipitation from homogeneous solution and examples, Co-precipitation, post-precipitation and remedies for their minimization, Washing of precipitate and ignition of precipitate, Brief idea about method of filtration and drying of</p>	7

	precipitate.	
IV	<p>Potentiometric titrations: General Introduction, Potentiometric titrations- Classical and analytical methods for locating end points, Types of Potentiometric Titration: Acid-base titration, Redox titration, Precipitation titration, Advantages of potentiometric titrations, Basic circuit of direct reading potentiometer.</p> <p>Colorimetry: Introduction, Lambert-Beer's law, basic terms used- Transmittance, Optical Density, Opacity, Extinction coefficient, Deviation from Beer's law, Classification of methods of 'colour' measurement or comparison. Photoelectric Colorimeter method- Single beam photo-electric colorimeter, Determination of unknown concentration by using Concentration-Absorbance plot.</p>	8
V	<p>Chromatography</p> <p>General Introduction, Basic principle of chromatography, Classification of Chromatography.</p> <p>Paper Chromatography: Principle, methodology, types of Papers and treatment, sample loading, choice of solvent, development: ascending, descending, circular; location of spot, determination of R_f value, applications and Advantages and Disadvantages.</p> <p>Thin layer chromatography: principle, solvent system, stationary phases, preparation of TLC plates, detecting reagents, methodology- sample loading, development, detection of spot, determination of R_f value, preparative TLC, applications and Advantages and Disadvantages. Comparison of TLC and paper chromatography.</p>	8

Reference Books:

1. A. I. Vogel, Textbook of Quantitative Chemical Analysis, 6th ed, Pearson Education, 2002.
2. S. M. Khopkar, Analytical Chemistry Problems and Solutions, New Age International Publishers, 2002.

3. S. M. Khopkar, Basic Concepts of Analytical Chemistry, 3rd ed, New Age International Publishers, 2008.
4. D. A. Skoog, D.M.West, F.J. Holler, Fundamantals of Analytical Chemistry, 8th ed. Philadelphia, Saunders College Publishing, 1996.
5. D. A. Skoog, F.J.Holler, T.A.Nieman, Principles of Instrumental Analysis, 6th ed. Philadelphia, Saunders College Publishing, 1996.
6. G. R. Chatwal and S. K. Anand: Instrumental methods of Chemical Analysis, Himalaya Publishing House.
7. H. H. Willard, L. L. Merritt and J. A. Dean; Instrumental methods of Analysis, 7thed. CBS Publishers, 1986.
8. Instrumental methods of chemical analysis - H.Kaur
9. Instrumental methods of chemical analysis -Willard, Merit & Dean
10. Text Book of Quantitative inorganic analysis - A.I.Vogel
11. Analytical chemistry - Walton
12. Textbook of qualitative inorganic analysis - Kolthoff and Sandel

B. Sc. Part-III (Chemistry) CBCS
Semester -V
Chemistry-SEC-SE-Basic Analytical Chemistry
Periods- 30 Hrs (Credit-2)

A) Theory: (10)

Basics in Practical Chemistry

Introduction, Definition and Explanation of following terms- Solute, Solvent, Solution, Polar solvent, Non-Polar solvent, Saturated solution, Unsaturated solution, Super saturated solution, Normality, Equivalent weight, Molecular weight, Molarity, Acidity of base, Basicity of acid, Percentage solution, ppt, ppm, ppb solutions, Mole Fraction, Weight fraction, Percentage composition by W/W, W/V, V/V, Numerical problems.

B) Hands-on: (Any Four) (15)

- **Preparation of solution of different concentration:** Normal, Molar, Molal, ppm, ppb, ppt, percentage, etc.
- To compare organic compounds by TLC method.
- Identification of adulterants in some common food items like coffee, tea powder, chilli powder, turmeric powder, coriander powder, etc. **(Any one)**
- Determination of dissolved oxygen (DO) of a water sample.
- Determination of pH of soil samples.

C) Demonstrations (Any Two) (05)

- Estimation of macro nutrients: Potassium, Calcium, Magnesium in soil samples by flame photometry.
- Estimation of Nitrogen by Kjeldahl's method
- Analysis of Organic compound by NMR.
- Analysis of Organic compound by UV.
- Analysis of Organic compound by IR.

Reference Books:

1. Willard, H.H., Merritt, L.L., Dean, J. & Settoe, F.A. *Instrumental Methods of Analysis*. 7th Ed. Wadsworth Publishing Co. Ltd., Belmont, California, USA, 1988.
2. Skoog, D.A. Holler F.J. & Nieman, T.A. *Principles of Instrumental Analysis*, Cengage Learning India Ed.
3. Skoog, D.A.; West, D.M. & Holler, F.J. *Fundamentals of Analytical Chemistry 6th Ed.*, Saunders College Publishing, Fort Worth (1992).
4. Harris, D. C. *Quantitative Chemical Analysis*, W. H. Freeman.
5. Dean, J. A. *Analytical Chemistry Notebook*, McGraw Hill.
6. Day, R. A. & Underwood, A. L. *Quantitative Analysis*, Prentice Hall of India.
7. Freifelder, D. *Physical Biochemistry 2nd Ed.*, W.H. Freeman and Co., N.Y. USA (1982).
8. Cooper, T.G. *The Tools of Biochemistry*, John Wiley and Sons, N.Y. USA. 16 (1977).
9. Vogel, A. I. *Vogel's Qualitative Inorganic Analysis 7th Ed.*, Prentice Hall.
10. Vogel, A. I. *Vogel's Quantitative Chemical Analysis 6th Ed.*, Prentice Hall.
11. Robinson, J.W. *Undergraduate Instrumental Analysis 5th Ed.*, Marcel Dekker, Inc., New York (1995).

B. Sc. Part-III (Chemistry) CBCS
Semester -VI
Chemistry-DSC-1002F1: Physical and Inorganic Chemistry
Theory: 60 Hrs (75 Lectures) Credits-4

Course Outcomes: After the completion of the course, the student will be able to:

- CO1** Understand the theoretical aspect of chemical transformation.
- CO2** Recognize about surface phenomenon and isotherms of surface reactions.
- CO3** Describe the methods of detections of radioactivity of the samples, the working principle of cells and batteries.
- CO4** Explain the chemistry behind the ethanol fermentation by anaerobic bacteria.
- CO5** Get idea about theories, factors and knowledge of prevention from corrosion.
- CO6** Gain the knowledge about ligands, chelates, classification and applications of chelating agents in analytical chemistry.
- CO7** Develop interest in various nuclear reactions and role of radio isotopes in medicinal, industrial and archaeology fields.
- CO8** Study the important aspects of the mechanism of the reactions involved in inorganic complexes of transition metals. Also acquire a basic understanding of nanochemistry, nanotechnology and its fascinating aspects.

Section-I: Physical Chemistry (38 Periods)

Units	Content	Periods
I	Thermodynamics Introduction, Recapitulation of all four laws of thermodynamics, Free energy: Gibbs function(G) and Helmholtz	12

	function(A), Criteria for thermodynamic equilibrium and spontaneity, Relation between G and H: Gibbs Helmholtz equation, Phase equilibria: Clapeyron-Clausius equation and its applications, Thermodynamic derivation of law of mass action, van't-Hoff isotherm and isochore, Fugacity and activity concept, Partial molar quantities, partial molar volume, Concept of chemical potential, Numerical problems.	
II	Adsorption Introduction, Adsorption as a surface phenomenon (mechanism), Definition of important basic terms: absorption, adsorption, adsorbant, adsorbate, interface etc., Distinction between adsorption and absorption, Characteristics of adsorption, Factors affecting adsorption, Types of adsorption, Distinction between physical adsorption and chemical adsorption, Adsorption isotherms: Freundlich, Langmuir adsorption isotherm, BET equation (derivation not expected), determination of surface area using Langmuir method and BET equations.	8
III	Radioactivity and its Detection Introduction, Detection and measurement of nuclear reactions by scintillation and Geiger Muller counter methods, Decay constant, half life and average life of radioactive elements, Radioactive equilibrium and range of α -particles, Geiger Nuttal relation, determination of radioactive constant (Decay constant), Numerical problems.	9
IV	Renewable Energy Sources Introduction, Batteries -Primary, Secondary cells, Lithium Ion Cell Fuel Cells- Types of fuel cells, Hydrogen- Oxygen fuel cell, Hydrocarbon - Oxygen fuel cell, Coal fired fuel cell. Biomass Energy - Introduction, Origin of biomass, conversion of biomass into energy by alcohol fermentation and anaerobic digestion method.	10

Reference Books:

1. P.W. Atkins, The Elements of Physical Chemistry: 4th ed. Oxford University Press, 2005.

2. G.M. Barrow, Physical Chemistry: 6th Ed, Tata McGraw Hill Publishing Co. Ltd., 2008.
3. G.K. Vemulapalli, Physical Chemistry: Prentice Hall of India Pvt. Ltd., 2009 .
4. G.W. Castellan, Physical Chemistry: 3rd ed., Narosa Publishing House, 2004.
5. S. Glasstone, Text Book of Physical Chemistry, 2nded, Affiliated East-West press Pvt. Ltd., New Delhi.
6. K.J. Laidler and J.H. Meiser, Physical Chemistry: 2nd ed. CBS, First Indian ed.1999.
7. S. Glasstone, Thermodynamics for Chemist: Affiliated East-West Press Pvt. Ltd., New Delhi.
8. Ira N. Levine, Physical Chemistry: 6th ed., Tata McGraw Hill, Inc., 2011.
9. Reisman Arnold, Phase equilibria -Edited by Ernest M. Loebe, New York and London Academic Press.
10. F.D. Ferguson and P.K. Jones, Phase Rule: (Butterworth Publisher).
11. J.N. Murrell and E.A. Boucher, Properties of Liquids and Solution: Wiley, 1982.
12. D.K. Chakravarty, Adsorption and Catalysis, Oxford Publishers.
13. D.J. Shaw, Introduction to Colloid and Interface Science: Butterworth and Co., 1981.
14. D.H. Everett, Basic Principles of Colloid Science: Royal Society of Chemistry, 1988.
15. Thomas J.M. and Thomas W.J. Introduction to Principles of Heterogeneous Catalysis: VCH Publishers, New York, 2008.
16. Friedlander, Kennedy and Joseph W., Nuclear and Radiochemistry -John Wiley & Sons, New York, 1955.
17. Arnikaar H.J., Essentials of Nuclear Chemistry: 4th ed, New Age International Ltd., Publishers, New Delhi.1955.

Section II: Inorganic Chemistry (37 Periods)

Units	Content	Periods
I	<p>Corrosion and Passivity</p> <p>Introduction of corrosion, Electrochemical theory of corrosion, Factors affecting on corrosion: i. Position of metals in the electrochemical series on the basis of standard reduction potential ii. Purity of metal iii. Effect of moisture iv. Effect of oxygen (differential aeration principle) v. Hydrogen overvoltage, Methods of protections of metals from corrosion, Passivity: i. Definition ii. Types of passivity iii. Oxide film theory and evidences iv. Applications of passivity.</p>	8
II	<p>Chelation</p> <p>A brief introduction with respect to ligands, chelating agent, chelation and metal chelates, Structural requirements of chelate formation, Difference between metal chelate and metal complex, Classification of chelating agents (with specific illustration of bidentate chelating agents), Application of chelation with respect to chelating agents - EDTA and DMG.</p>	7
III	<p>Nuclear Chemistry</p> <p>Nuclear reactions and energetic of nuclear reactions, Types of nuclear reactions: i) Artificial transmutation ii) Artificial radioactivity iii) Nuclear fission and its application in Heavy water nuclear reactor iv) Nuclear fusion, Applications of radio-isotopes as tracers: i) Chemical investigation-Esterification ii) Structural determination-Phosphorus pentachloride iii) Analytical Chemistry-Isotopic dilution method for determination of volume of blood iv) Age determination-Dating by C¹⁴.</p>	10
IV	<p>Inorganic Reaction mechanism</p> <p>Introduction, Classification of Mechanism Association, dissociation, interchange and the rate determining steps, SN¹ and SN² reaction for inert and labile complexes, Mechanism of substitution in cobalt (III) octahedral complexes, Trans effect and its theories, Applications of trans effect in synthesis of Pt (II) complexes.</p>	6

V	Nanomaterials Introduction and Importance of nanomaterials, Properties (Comparison between bulk and nanomaterials): i) Optical properties ii) Electrical conductivity and iii) Mechanical properties, Methods of preparation: Top-down, bottom-up fabrication a) Co precipitation method b) Sol-gel method c) Chemical reduction method d) Hydrothermal method, Applications of Nanomaterials.	6
---	--	---

Reference Books:

1. Concise Inorganic Chemistry by J.D. Lee - 5th Edition.
2. Inorganic Chemistry, - D.F. Shriver & P.W. Atkins- C. H. Longford ELBS - 2nd Edition.
3. Basic Inorganic Chemistry, - F.A. Cotton and G. Wilkinson, Wiley Eastern Ltd 1992.
4. Concept and Model of Inorganic Chemistry by Douglas - Mc Daniels - 3rd Edition.
5. Co-ordination Compounds by Baselo and Pearson
6. Inorganic Chemistry by J.E. Huheey, 4th Edition, Pearson Education.
7. Theoretical Inorganic Chemistry by Day and Selbin.
8. Inorganic Chemistry by A. G. Sharpe - 3rd Edition
9. Principles of Bioinorganic Chemistry by S. J. Lippard and J. M. Berg, 1st Ed
10. Advanced Inorganic Chemistry (4th Edn.) Cotton and Wilkinson
11. Essentials of Nuclear Chemistry by H. J. Arnikar.
12. Nuclear Chemistry by M. N. Sastri.
13. Organometallic Chemistry by R. C. Mahrotra A. Sing, Wiley Eastern Ltd. New Delhi.
14. Principles of Inorganic Chemistry by Puri, Sharma and Kalia, Vallabh Publication. Pitampur Delhi.
15. Text book of Inorganic Chemistry by K. N. Upadhyaya Vikas Publishing House - New Delhi.
16. Nanotechnology: Principles and Practices- Sulbha Kulkarni
17. Introduction to Nanotechnology by Poole, C.P. & Owens, F.J. John Wiley & Sons, 2003.

B. Sc. Part-III (Chemistry) CBCS
Semester -VI
Chemistry-DSC-1002F2: Organic Spectroscopic Techniques &
Industrial Chemistry
Theory: 60 Hrs (75 Lectures) Credits-4

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Understand the basic concepts of spectroscopy.
- CO2:** Acquire the knowledge of various spectroscopic techniques such as UV, IR, NMR and Mass Spectroscopy.
- CO3:** Interpret molecular structures by using spectroscopic techniques.
- CO4:** Understand the basics of industrial chemistry.
- CO5:** Learn the manufacturing processes of heavy chemicals.
- CO6:** Adopt the knowledge of sugar and jaggery industry.
- CO7:** Learn and understand fermentation processes involved in manufacturing of alcohol.
- CO8:** Illustrate the overall information regarding manufacture of fertilizers.

Section-I: Organic Spectroscopic technique (38 Periods)

Units	Content	Periods
I	Introduction to Spectroscopy Meaning of spectroscopy, Nature of electromagnetic radiation -wave length, frequency, energy, amplitude, wave number, and their relationship, different units of measurement of wavelength frequency, different regions of electromagnetic radiations, Interaction of radiation with matter-absorption, emission, florescence and scattering, Types of spectroscopy and advantages of spectroscopic methods. Energy types and energy levels of atoms and molecules.	3
II	Ultra-Violet (UV) Spectroscopy Introduction, Beer-Lamberts law, absorption of U.V. radiation by organic molecule leading to different excitation, Terms used in U.V. Spectroscopy- Chromophore, Auxochrome,	5

	Bathochromic shift, hypsochromic shift, hyperchromic and hypochromic effect, Modes of electromagnetic transitions. Effect of conjugation on position of U.V. band, Calculation of λ -max by Woodward and Fisher rules for dienes and enones systems, Colour and visible spectrum, Applications of U.V. Spectroscopy.	
III	Infra-Red (IR) Spectroscopy Introduction, Principle of IR Spectroscopy, IR Instrumentation, schematic diagram, Fundamental modes of vibrations, Condition for absorption of IR radiations, Regions of I.R. Spectrum, fundamental group region, finger print region, Hooks Law for Calculation of vibrational frequency, IR Sampling, Factors affecting on IR absorption frequency, Characteristic of I.R. absorption of following functional groups Alkanes, alkenes, alkynes, Alcohol and phenols, Ethers, Carbonyl compounds, Amines, Nitro com, Aromatic Compounds.	8
IV	Nuclear Magnetic Resonance (NMR) Spectroscopy Introduction, Principles of PMR Spectroscopy, NMR-Instrumentation, Schematic diagram, Magnetic and nonmagnetic nuclei, Chemical shift- definition, measurement, calculation, Factors affecting Chemical shift, Shielding, & deshielding, Peak Integration, Merits of TMS as PMR reference compounds, Coupling Constant, Types of Coupling Constant, Spin-spin splitting (n+1 rule), Applications	9
V	Mass spectroscopy Introduction, Principle of mass spectroscopy, Mass spectrometer - schematic diagram, Types of ions produced in mass spectrum, Fragmentation patterns of- alkanes, alkenes, aromatic hydrocarbons, alcohols, phenols, amines and carbonyl compounds, McLaffrey rearrangement, Applications.	8
VI	Combined Problems based on UV, IR, NMR and Mass Spectral data.	5

Reference Books:

1. Absorption Spectroscopy of Organic Molecules by V. M. Parikh.
2. Spectroscopy of Organic compounds by P. S. Kalsi.
3. Elementary Organic Absorption Spectroscopy by Y. R. Sharma.
4. Instrumental Methods of Analysis (7th edition) by Willard, Merritt, Dean, Settle.
5. Spectroscopy by G. R. Chatwal and S. K. Anand
6. Spectroscopy by Pavia, Lampman, Kriz
7. Organic Spectroscopy (2nd edition) by Jag Mohan
8. Organic Spectroscopy (3rd edition) by William Kemp
9. Instrumental Methods of Chemical Analysis by H. Kaur.

Section-II: Industrial Chemistry (37 Periods)

Units	Content	Periods
I	Introduction to Industrial Chemistry General introduction, Indian Scenario of chemical industries, types of chemical industry, basic requirements of chemical industries, chemical production and raw materials; unit processes and unit operations and its types; modes of manufacturing-batch, semi-batch and continuous process; Introduction to various departments in industry: Quality control, Quality assurance, process development, Research and Development, Analytical development, Environmental health and safety, Industrial legislations-copy right act, patent act, trademarks; MSDS of hazardous chemicals.	7
II	Manufacturing of Heavy Chemicals General introduction and Indian Scenario of Heavy chemicals, Manufacture of NH_3 by modified Haber-Bosch process, Physico-chemical principles and uses of NH_3 . Manufacture of H_2SO_4 by contact process, Physicochemical principles, and uses of H_2SO_4 . Manufacture of HNO_3 by Ostwald's process, Physicochemical principles involved and uses of HNO_3 .	6

III	<p>Manufacturing of Sugar and Jaggery</p> <p>Sugar: Introduction, importance of sugar industry, Manufacture of cane sugar: raw material, Extraction, Clarification and Concentration of cane juice, Crystallization of sucrose, Centrifugation, Refining of cane sugar, Utilization of by-products of sugar industries.</p> <p>Jaggery: Composition of Jaggery, forms of jaggery, Production process of jaggery, analysis of Jaggery- Moisture content, pH, reducing and non- reducing sugar, colour, total viable bacterial count, yeast count, Mold count.</p>	8
IV	<p>Fermentation Industry</p> <p>Introduction, importance, Basic requirement of fermentation process, Factors favouring fermentation, fermentation operations. Manufacture of Industrial alcohol (Ethyl alcohol) from a) Molasses b) Food grains, c) manufacture of alcohol from fruits (wine). Grades of alcohols: Silence spirit, rectified spirit, absolute alcohol, proof spirit, denatured spirit, duty and duty free alcohol. Importance of power alcohol as fuel.</p>	8
V	<p>Fertilizers</p> <p>General introduction, Classification of fertilizers, Necessity and requirements of good fertilizers, Manufacture of the following fertilizers: Urea, calcium ammonium nitrate, ammonium phosphates, polyphosphate, triple superphosphate, compound and mixed fertilizers. Introduction to biofertilizers.</p>	8

Reference Books:

1. Industrial Chemistry-B.K. Sharma, Goyal publishing house, Mirut
2. Shreeve's Chemical Process Industries 5th Edition- G.T. Oustin, McGraw Hill
3. Riegel's hand book of Industrial Chemistry, 9th Edition- Jems A. Kent

4. Industrial chemistry-R.K. Das, 2nd Edition, 1976.
5. Hazards in the Chemical Laboratory, 2nd Edition- G. D. Muir, The Chemical Society, London
6. Industrial chemistry-Kent
7. Industrial chemistry-Rogers

B. Sc. III

Syllabus for Practical Chemistry DSC-1002E and DSC-1002F

Physical Chemistry Practical's

I. Non instrumental Experiments:

i) Partition Law

To determine the partition coefficient of CH_3COOH between H_2O and CCl_4 .

ii) Viscosity

To determine the viscosity average molecular weight of a polymer.

iii) Adsorption

To investigate the adsorption of oxalic acid by activated charcoal and test the validity of Freundlich & Langmuir isotherms.

iv) Solubility

To study the effect of addition of electrolyte (NaCl or KCl) on the solubility of Benzoic acid at room temperature.

B. Chemical Kinetics. (Any four)

1. The study of energy of activation of first order reaction i.e. hydrolysis of methyl acetate in presence of $0.5 \text{ N HCl} / 0.5 \text{ N H}_2\text{SO}_4$.
2. The study of energy of activation of second order reaction i.e. reaction between $\text{K}_2\text{S}_2\text{O}_8$ and KI (Equal concentrations).
3. The study of energy of activation of second order reaction i.e. reaction between $\text{K}_2\text{S}_2\text{O}_8$ and KI (Unequal concentrations).
4. To study the hydrolysis of methyl acetate by using its two concentrations in presence of 0.5 N HCl and hence find velocity constant of the reaction.
5. To study the effect of addition of electrolyte (KCl) on the reaction between $\text{K}_2\text{S}_2\text{O}_8$ and KI (Equal concentrations).

C. Partial molar volume.

1. To determine the partial molar volume of ethyl alcohol in a mixture of ethyl alcohol and water (Any seven mixtures be given).

II. Instrumental experiments

A. Potentiometry (Any four)

1. Titration of strong acid with strong alkali.
N.B. i) 8 to 10 ml of 1N acid solution to be given by examiner in 100 ml volumetric flask & student should dilute it to 100 ml and 10ml of this solution is taken for titration.
ii) Experiment is carried out by taking pilot run from 1 to 10 ml and then final run taking 0.2 ml reading in the range of end point.
2. Preparation of buffer solution and determination of their pH (Any five buffer solutions), Theoretical calculation of pH values by using Henderson's equation.
3. Determination of standard electrode potential of Zn/Zn⁺⁺, Cu/Cu⁺⁺, Ag/Ag⁺ (Any two).
4. Estimate the amount of Cl⁻, Br⁻ and I⁻ in given unknown halide mixture by titrating it against standard AgNO₃ solution.
5. Titration of ferrous ammonium sulphate using K₂Cr₂O₇ solution and to calculate redox potential of Fe⁺⁺, Fe⁺⁺⁺ system.

B. Conductometry (Any three).

- N.B. i) 8 to 10 ml of 1N acid solution to be given by examiner in 100 ml volumetric flask & student should dilute it to 100 ml and 10ml of this solution is taken for titration.
1. Titration of a mixture of weak acid and strong acid with strong alkali
 2. To study the effect of substituent on dissociation constant of weak acid with respect to acetic acid and monochloroacetic acid (cell constant to be given).
N.B. Calculate K by using formula $K = \frac{\alpha^2 C}{1 - \alpha}$
 3. To determine the velocity constant of hydrolysis of ethyl acetate by NaOH solution by conductometric method.
 4. To determine the normality of citric acid in lemon by titrating it against standard 0.2 N NaOH solution by conductometric method.
 5. To determine λ_{∞} of strong electrolyte (NaCl or KCl) and to verify Onsager equation.

C. Refractometry (Any One)

1. To determine the percentage composition of unknown mixture by (i) graphical method and (ii) by composition law (Densities of pure liquids A & B be given).
2. To determine the molar refractivity of methyl acetate, ethyl acetate, n-hexane and carbon tetrachloride and calculate the refraction equivalents of C, H and Cl atoms.

D. Colorimetry (Any Two).

1. To verify Lambert - Beer's law using CuSO_4 solution.
2. To estimate of Fe^{+++} ions by thiocyanate method.
3. To estimate Fe^{+++} ions using salicylic acid by colorimetric titration.
4. To determine the order of reaction for the oxidation of alcohol by potassium dichromate and potassium permanganate in acidic medium colorimetrically.

E. pHmetry (Any One).

1. To determine the dissociation constant of monobasic acid (Acetic acid).
2. To determine the dissociation constant of dibasic acid (Malonic acid).
3. To determine hydrolysis constant of aniline hydrochloride.

Reference Books:

1. Findlay's Practical Physical Chemistry (Longman)
2. Advanced Practical Physical Chemistry by J. B. Yadav, Goel publishing house.
3. Practical Physical Chemistry by B. D. Khosla, V. C. Garg (R. Chand and Co.)
4. Systematic experimental Physical Chemistry by Rajbhoj, Chandekar (Anjali Publication) Aurangabad.
5. Practical Physical Chemistry: Nandkumari, Kothari and Lavande.
6. Practical Physical Chemistry by Gurtu (S. Chand).
7. Text Book of Qualitative Inorganic Analysis by A. I. Vogel (ELBS Longman).

Inorganic Chemistry Practical's

Gravimetric Estimation: (G). N. B.: Any two experiments from G1 to G3 and any one experiment from G4 & G5.

1. G1: Gravimetric estimation of iron as ferric oxide from the given solution containing ferrous ammonium sulphate, copper sulphate and free sulphuric acid.
2. G2: Gravimetric estimation of aluminium as aluminium oxide from the given solution containing potash alum, copper sulphate and free sulphuric acid.
3. G3: Gravimetric estimation of barium as barium sulphate from the given solution containing barium chloride, ferric chloride and free hydrochloric acid.
4. G4: Gravimetric estimation of manganese as ammonium manganese phosphate from the given solution containing manganese sulphate, copper sulphate and free sulphuric acid.
5. G5: Gravimetric estimation of nickel as bis(dimethyl glyoximate) nickel (II) from the given solution containing nickel sulphate, ferrous ammonium sulphate and free Sulphuric acid.

Inorganic Preparations (P) (Any six):

- P1. Preparation of sodium cuprous thiosulphate
- P2. Preparation of potassium trioxalato aluminate(III).
- P3. Preparation of tris (ethylene diamine) nickel(II) thiosulphate.
- P4. Preparation of tetra aminecopper(II) sulphate.
- P5. Preparation of ammonium diammine tetrathiocyanatochromate (III)
- P6. Preparation of tris(thiourea) cuprous sulphate.
- P7. Synthesis of CuO nanoparticles.
- P8. Preparation of pigment (Zinc Oxide).
- P9. Preparation of Urea formaldehyde resin.
- P10. Preparation of Phenol formaldehyde resin.

Titrimetric Estimations:

A) Percentage Purity (Any two):

- V1. Determination of percentage purity of tetrammine copper (II) sulphate.
- V2. Determination of percentage purity of ferrous ammonium sulphate.
- V3. Determination of percentage purity of potassium trioxalato aluminate.

B) Analysis of Commercial Sample. (Any five):

- V4. Determination of percentage of magnesium in the given sample of talcum powder.
- V5. Determination of amount of aluminum in the given solution of potash alum.
- V6. Determination of titrable acidity in the given sample of milk or lassi.
- V7. Determination of Fe in cement.
- V8. Determination of chlorine in bleaching powder.
- V9. Determination of Free acidity in ammonium sulphate fertilizer.
- V10. Determination of percentage of CaCO_3 in chalk.
- V11. Determination of COD.

C) Ion exchange method (Any two):

- V11. Determination of amount of sodium present in the given solution of common salt using cation exchange resin (By Acid Base titration)
- V12. Determination of amount of magnesium in the given solution containing (Mg^{2+} and Zn^{2+}) using anion exchange resin and standard solution of EDTA.
- V13. Determination of amount of zinc in the given solution containing (Mg^{2+} and Zn^{2+}) using anion exchange resin and standard solution of EDTA.

Organic Chemistry Practical's

1. Separation and identification of Binary Organic Mixtures:

2. Organic Estimations (Any four):

- 1) Estimation of Sucrose. /Glucose
- 2) Estimation of Nitro group
- 3) Estimation of acid and ester present in given mixture of acid and ester.
- 4) Estimation of Sulphur in thiourea (Messanger's method.)
- 5) Estimation of glycine (amino acid).
- 6) Saponification value of Oil.
- 7) Determination of number of $-OCH_3$ group.
- 8) Determination of Purity of Phenol.

3. Organic Preparations (Any four):

Preparation of,

- 1) Dihydropyrimidone.
- 2) Dibenzalpropanone.
- 3) Benzilic acid.
- 4) m- Nitroaniline from m- Dinitrobenzene.
- 5) Hippuric acid from glycine.
- 6) Ethylbenzene from acetophenone.
- 7) Adipic acid from cyclohexene.

4. Preparation of Derivatives(Any five):

- 1) Picrate derivative of β - Naphthol and anthracene.
- 2) Urea oxalate derivative of Urea.
- 3) Iodoform derivative of Acetone.
- 4) 2:4 DNP derivative of Acetaldehyde.
- 5) m-Dinitrobenzene from Nitrobenzene.
- 6) Phenylhydrazone derivative of Aldehyde and Ketone.
- 7) Preparation of oxime derivative of Benzophenone.

Nature of Theory and Practical Examinations

N. B. The question paper should cover the entire syllabus. Marks allotted to questions should be in proportion to the lectures allotted to respective units.

Nature of Discipline Specific Elective (DSE) Question Paper

Total Marks: 80 Theory + 20

Internal Marks: (Section-I: 40+10, Section-II: 40+10)

Que. No.	Particulars	Marks	Marks of options
Section-I			
1	Multiple choice questions (One mark for each question)	08	00
2	Long answer type questions (2 out of 3)	16	08
3	Short answer type questions (4 out of 6)	16	08
Section-II			
4	Multiple choice questions (One mark for each question)	08	00
5	Long answer type questions (2 out of 3)	16	08
6	Short answer type questions (4 out of 6)	16	08
Total		80	32

- The duration of each theory paper for examination will be of 3 hours
- Internal examination (Oral/Seminar/test/ assignment) will be conducted for 10 marks for each paper.

Nature of Skill Enhancement Course (SEC) Question Paper

The nature of SEC exam for

Sem-V will be multiple choice questions for 50 marks

Sem-VI project work and industrial study tour for 50 marks.

Nature of Practical Examination

Practical examination will be of 200 marks. The distribution of marks will be as follows:

1. Physical Section: 65 marks
2. Inorganic Section: 70 marks
3. Organic Section: 65 marks

Total: 200 marks

The duration of practical examination will be of three days- six and half hours per day.

“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharashi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha’s
Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF BIOTECHNOLOGY OPTIONAL

B.Sc. Part - III
Semester-V & VI

SYLLABUS

Under Choice Based Credit System

to be implemented from Academic Year 2020

B.Sc. III (Sem -V and VI) Biotechnology Optional**Course Structure**

Semester	Course code	Course title	Credits	Marks
V	DSE-1009 E1	Plant & environment biotechnology	4	100
	DSE-1009 E2	Large scale manufacturing process	4	100
	SEC	Entrepreneurship development	2	50
	AECC -E-1501	English	4	50
VI	DSE-1009 F1	Advance in Biotechnology	4	100
	DSE1009 F2	ATC & cell metabolism	4	100
	SEC	Ecology	2	50
	AECC-F-1501	English	4	50
	Practical	III & IV	8	100
	Practical	V & VI	8	100
		Total credits (SEM V+VI) Including SEC ,AECC	44	800

B.Sc. III CBCS
Semester V Paper V
DSE-1009-E1 Plant and Environmental Biotechnology

Course Outcomes: On completion of the course student will be able to:

CO1. Formulate media to produce plantlets on an industrial scale

CO2. Produce transgenic plants with high quality.

CO 3. Describe the concept of toxicity.

CO4. Discover different ways of Bioremediation.

Sr. no.	CREDIT-I	15
1	Conventional and Non conventional fuel and environmental impact Modern fuel-Biogas , Bioethanol ,Biodiesel production Global environmental problems-Green house effect, ozone depletion, acid rain Waste- Define, Types- solid and liquid waste Solid waste management Waste water treatment- Primary treatment- Screening, grinding, grit removal, flocculation, sedimentation, coagulation Secondary treatment- aerobic (Trickling filter, activated sludge, stabilization pond) and anaerobic (Up flow anaerobic sludge digestion) Tertiary treatment- chemical, precipitation	
	CREDIT-II	15
2	Bioremediation- Define, Types, Example- hydrocarbon , dye, heavy metal, pesticides Bioremediation in Agriculture (Composting and vermicompost) Concept of Biopesticides, Biosorbption, Phytoremediation Bioremediation- Types, Chemistry and examples- Copper and Uranium Introduction to Biofertilizer- Inoculants of Rhizobium, Azotobacter, , Frankia, Cyanobacteria, Phosphate solubilizer with method of application	

	Section II	
	Credit III	15
3	<p>Concept & Historical Background Conventional and Non conventional methods for crop improvement Landmarks in plant tissue culture Concept of cell theory, Cellular totipotency, Differentiation, Dedifferentiation, Redifferentiation, Regeneration.</p> <p>Scope, recent advance & applications of PTC Infrastructure & organization of Lab Different work areas Equipments & Instruments required</p> <p>Media & culture preparation Role of micro & macro nutrients, Vitamins, amino acid, Hormones, activated charcoal, Solidifying agents. Culture Conditions- pH, Temperature, Humidity.</p> <p>Aseptic Techniques Sterilization of Media, Reagent & Glassware Surface sterilization of explants</p> <p>Practical applications of tissue and organ culture - Application in agriculture, application in horticulture and forestry, pharmaceutical ,research,paliobotany applications in industries, transgenic plants.</p>	
	Credit IV	15
4	<p>Callus Culture Introduction, principle, morphology & internal structure, protocol, factors affecting.</p> <p>Somatic embryogenesis Introduction, principle, protocol, factors affecting, applications.</p> <p>Suspension Culture Introduction, principle, protocol, growth measurement, synchronization, applications.</p> <p>Pathways for clonal propagation</p> <p>Organogenesis Introduction, principle, protocol, factors affecting, applications.</p> <p>Haploid culture Introduction, principle, protocol, applications, advantages of pollen culture over anther culture</p> <p>Concept of Somaclonal Variation</p>	

	Concept Protoplast culture	
--	-----------------------------------	--

Reference book:

1. Environmental biotechnology- InduShekhar Thakur.
2. Environmental biotechnology-Chattergy.
3. Environmental biology-Verma& Agarwal.
4. Environmental chemistry-B.K.Sharma.
5. Environmental Pollution- Peavy& Rowe.
6. Environmental problems & solutions- Asthana & Asthana.
7. Environmental science-SiagoCanninhham.
8. Environmental biotechnology-S.N.Jogdand.
9. Water engineering- Treatment dispose & reuse-Metcalf & Eddy.
10. Environmental Biotechnology-C.S.K Mishra &Juwarkar
- 11.Introduction to plant tissue culture-M.K.Razdan
12. Plant tissue culture – Theory & practice- S.S.Bhojwani&M.K.Razdan
13. Crop improvement in biotechnology-H.S.Chawala
14. Plant tissue culture-Kalyankumardey
15. Textbook of biotechnology- R.C.Dubey
16. Plant tissue culture- U .Kumar.
17. Biotechnology- B.D.Singh

**B.Sc. III CBCS
Semester V Paper VI**

DSE-1009-E2- Large scale manufacturing process

Course Outcomes: On completion of the course student will be able to:

CO 1. Discriminate various types of fermentation medium with respect to product formation.

CO2. Design a Fermenter for appropriate fermentation.

CO3. Enumerate steps of downstream processing to purify industrially important product.

CO4. Choose the correct method for qualitative & quantitative analysis of end product.

	Credit I	15
1	<p>Concept of Bioprocess engineering and fermentation technology</p> <p>Basic design of fermentator , its construction material and accessories associated with Fermenter, Fermentation media</p> <p>Types of Fermenter- Tube tower Fermenter, bubble cap Fermenter, fluidized bed Fermenter, Air lift Fermenter</p> <p>Concept of sterilization of fermentation media, equipment and air</p> <p>Screening of industrially important microorganism- Primary and Secondary screening, Pure culture techniques</p> <p>Stain improvement by mutation, Genetic engineering, Genetic recombination</p> <p>Maintenance of industrially important microorganism. culture collection centre in India Examples</p>	
2	<p align="center">Credit II</p> <p>Scale up-Bench studies, pilot studies, industrial scale</p> <p>Use of computer in fermentation, Building of inoculums, pitching Types of fermentation-Continues, Batch, Solid state fermentation Downstream processing- Centrifugation, Distillation, Solvent extraction, Filtration, Ultra filtration, Precipitation, Ion Precipitation, Ion exchange chromatography, Gel filtration , Affinity chromatography, crystallization and drying</p> <p>Assay -</p> <p>Physico chemical assay- Gravimetric, Spectrophotometric, Chromatographic</p> <p>Microbiological assay-Diffusion assay, Turbidometric assay, Metabolic assay, end point determination assay, enzymatic assay</p> <p>Introduction to Quality control</p>	15

	Section II	
	Credit III	15
3	Specific fermentation: Citric acid Fermentation Penicillin fermentation L-Lysine fermentation L-Asparaginase fermentation Single cell protein- Spirulina Amylase production Vinegar production Bread fermentation Xanthan gum fermentation Vitamin B12 Lactic acid fermentation	
	Credit IV	15
4	Alcoholic fermentation- Red wine and Beer fermentation Cheese fermentation. Fermentation economics Intellectual property rights- Introduction Patents- Introduction , Criteria and process of patenting Trademarks, Trade secrets Copyrights	

Reference books-

1. Comprehensive Biotechnology volume 3 – Murray Moo- Young
2. Basic Biotechnology- Colin Ratledge&BijonKritinsen, cambridge university press ,UK
3. Industrial Microbiology –casida
4. Principles of Fermentation technology-Whittekarr
5. Industrial Microbiology- Prescott &duns
6. Industrial Microbiology- A.H.Patel
7. Industrial Microbiology-Pepler& Perlma

**B.Sc. III CBCS
Semester VI Paper VII
DSE- 1009 F1 Advances in Biotechnology**

Course Outcomes: On completion of the course student will be able to:

CO 1. Generate new strategies of gene therapies

CO2. Construct a drug molecule.

CO3. Illustrate various biochemical techniques.

CO 4. Understand various tracer techniques & and their applications

	Credit I	15
1	<p>Cell disruption methods-Grinding, abrasive presses, Enzymatic method, sonication.</p> <p>Centrifugation Introduction and basic principle of sedimentations Types of centrifuges, Types of Centrifugation- Differential centrifugation, density Gradient centrifugation .</p> <p>Separation of proteins by precipitation-Salt precipitation - procedure and methodology of Salting out by Ammonium sulphate. Organic solvent precipitation</p> <p>Dialysis</p> <p>Chromatographic methods - Principle, methodology and applications of Gel Filtration method 2 Ion exchange chromatography 3 Affinity chromatography 4 Gas liquid chromatography (GLC) 5 High Performance Liquid chromatography</p>	
	Credit II	15

2	<p>Electrophoresis. Introduction, types and general principle Supporting media - (Agarose. poly acryl amide gel) Electrophoresis of protein SDS-PAGE electrophoresis- Methodology and Applications. Isoelectric focusing Tracer technique;- Introduction - Radioactivity, radioisotopes, types of radiation (α, β, γ), half-life period of radioisotope. Methods of measurement of radioactivity Gas ionization, Solvent excitation- Liquid scintillation counter Autoradiography Applications of radioisotopes in biological system Spectroscopic method - Principle. Instrumentation and applications 1. Infra red spectroscopy 2. Florescence spectroscopy 3. Atomic spectroscopy</p>	
---	---	--

	Section II	
	Credit III	15
3	<p>Techniques in gene biotechnology- DNA fingerprinting -Introduction, Genetic marker Use of minisatellite and microsatellite, Multilocus and single locus probes. Scheme for DNA fingerprinting and applications</p> <p>Concept of Chromosome walking and jumping, Gene targeting Human gene therapy- Types of gene therapy- 1.Somatic gene 2.Germ line Methods of gene transfer-(Virus vector , non viral approach Limitations)</p> <p>Antisense therapy- Introduction, Principle, Application</p>	
	Credit IV	15

4	<p>BIOINFORMATICS Computer use in Biology- Internet, Networking- HTTP, HTML,WAN,LAN,MAN</p> <p>Information resource- National Center for Biotechnology Information(NCBI) , European Bioinformatics Institute (EBI), Sequence retrieval system- Entrez, DBGet</p> <p>Genomics- Human Genome Project- Goal, Application, Introduction to nucleic acid database- Gene Bank, EMBL , DDBJ Introduction to Proteomics, Primary protein sequence database - SWISS-PROT, PIR, MIPS, NRL-3D, Tr EMBL</p> <p>Introduction to secondary protein sequence database- PROSITE, PROFILE, PRINT,Pfam, BLOCK, IDENTIFY Other database- Literature database, Pub Med</p> <p>Introduction to structural database- Protein databank (PDB) ,</p> <p>Introduction to Molecular docking , Homology modelling</p>	
---	--	--

References: -

1. Practical Biochemistry principles and techniques – Wilson and Walkar
2. Protein purification –Robert Scoop
3. Biophysical Chemistry –Nath Upadhyay
4. Textbook of Biotechnology- R.C.Dubey
5. Textbook of Biotechnology- B.D.Singh
6. Gene Biotechnology -S.N.Jogdand
7. Gene Manipulation – Old and Primrose
8. Introduction to Bioinformatics – Rastogi.
9. Introduction to Bioinformatics- T. K. Attwood

B.Sc. III CBCS
Semester VI Paper VIII
DSE- 1009 F2 Animal tissue culture and cell metabolism

Course Outcomes: On completion of the course, students will be able to:

CO 1. Compare various pathways in Cell.

CO2. Elaborate virus reproduction cycles to develop strategies for antiviral therapies

CO 3. Produce transgenic animals for economic importance

CO 4. Become a good entrepreneur to set up ATC-based industries.

Section I		
Credit I		15
1	<p>Historical Background Landmarks in Animal tissue culture Scope, recent advances & applications of ATC Requirements of Animal cell culture Overview of ATC Lab Infrastructure, Substrate for cell growth, Equipments required for animal cell culture (Laminar air flow, CO2 incubator, Centrifuge, Inverted microscope). Sterilization of Glassware's, Equipments & culture media Glassware sterilization, reagent and media sterilization, sterility testing. Culture media Natural media, synthetic media (serum containing media, serum free media, balanced salt solution, media constituent, complete culture media, physicochemical properties of media).</p>	
Credit II		15
2	<p>Conceptual Background Biology and Characterization- Characteristics of cultured cells, cell adhesion, cell proliferation, cell differentiation, metabolism of cultured cells, Initiation of cell culture, Evolution and development of cell lines. Basic technique of mammalian cell culture Isolation of tissue, disaggregation of tissue, measurement of viability, primary cell culture, Cell lines, Maintenance of cell culture, Subculture, Stem cell cultures. Scale up in monolayer- Roller bottle culture, Spinner Culture, Microcarrier culture Organ and Histotypic culture Types and maintenance of organ culture, Histotypic culture</p>	
Section II		
Credit III		15

3	<p>General Metabolism- Introduction, Definition, Reactions of Metabolic Pathways. Methods for study of Metabolic Pathways by using radioisotopes, by using mutants, in vitro studies.</p> <p>- Metabolism of Carbohydrates</p> <p>1- Carbohydrate metabolism- Reactions, Energetics Significance, of-Glycolysis</p> <p>2- Reactions, significance of Pentose Phosphate Pathway</p> <p>3- Reactions & Energetics of TCA Cycle.</p> <p>Lipid Metabolism</p> <p>1 Biosynthesis of Saturated Fatty acid- Palmitic Acid</p> <p>2 β-Oxidation of Fatty acid - Palmitic Acid</p> <p>Respiratory Electron Transport Chain</p> <p>1 Components of ETC</p> <p>2.Mechanism of ATP generation – Chemical coupling hypothesis , Chemiosmotic hypothesis.</p>	
Credit IV		
	<p>Protein and Nucleotide Metabolism.</p> <p>1. Urea cycle</p> <p>2. Purine biosynthesis (Denovo and Salvage pathway)</p> <p>3. Purine degradation</p> <p>4. Pyrimidine biosynthesis</p> <p>5. Pyrimidine degradation</p> <p>Regulation of purine and pyrimidine metabolism</p> <p>Virology-</p> <p>Introduction.</p> <p>Types of viruses on the basis of Host & type of Nucleic acid</p> <p>General Characteristics of Viruses.</p> <p>General Structures of Viruses- TMV, Adeno virus, T4 Bacteriophage-</p> <p>Reproduction of Viruses- .1- Adeno virus .2- Bacteriophages- T4, 3. λ- Phage</p> <p>Isolation & Cultivation of Plant & Animal Viruses- Tissue culture & Embryonated Eggs</p>	15

Reference books :

1. Animal cell culture- Fresheny.
2. Biotechnology – B.D.Singh.
3. Biotechnology- R.C.Dubey.
4. Gene Biotechnology- S.N.Jogdand
5. Biochemistry – Lubert Strayer.
6. Principles of Biochemistry- Lehninger.
7. Virology- Luria & Delbruck. 4. Fundamentals of Biochemistry- J.L.Jain S.Chand
8. Animal cell culture- Fresheny.

Practical III.IV.V.VI	
S.N.	Practical titles
	Techniques in plant and animal tissue culture
1	Laboratory organization and general techniques in PTC
2	Preparation of MS media , stock solution and medium
3	Aseptic seed germination
4	Micro propagation stage I- Initiation of micropropagation Shoot tip culture ,auxiliary bud culture
5	Micro propagation stage II- structure and multiplication of culture
6	Callus culture techniques- Initiation of culture and callus morphology
7	Suspension culture technique- Initiation of culture, growth requirement
8	Anther Culture technique
9	ATC laboratory design and equipment used in ATC
10	Animal cell culture media preparation sterilization, washing, packing
	Techniques in Environmental biotechnology
11	Determination of BOD
12	Determination of COD
13	Isolation of <i>Rhizobium</i> from root nodules
14	Isolation of <i>Azotobacter</i> from soil
15	Isolation of PSB from soil
16	Determination of hardness of water
17	Determination of oligodynamic effect of copper on pathogen
	Techniques from microbiology Bioprocess
18	Screening of Amylase Producers from Soil
19	Production of amylase by submerged culture method. Estimation of amylase activity by DNSA method
20	Isolation of vitamin B12 mutant
21	Bioassay of antibiotic
22	Bioassay of vitamin B12
23	Estimation of citric acid from lemon juice
24	production of ethanol by using immobilized yeast cells and determination of alcohol content by specific gravity method
25	Production of xanthan gum from xanthomonas

	Techniques from advanced biotechnology
26	Purification of protein by gel filtration chromatography
27	Purification of protein by ion exchange chromatography
28	Immobilization of invertase by using sodium alginate ,study of invertase activity by DNSA method
29	Estimation of alcohol by potassium dichromate method
30	Demonstration of SDS -PAGE of protein
31	Demonstration of thermocycler
32	Isolation of coli phages
33	Transformation of E.Coli
34	Determination of molecular weight of DNA
35	Browsing and understanding of NCBI web page Introduction of literature database -Pubmed
36	Protein structure exploring database - Protein Data Bank (PDB) and use of Rasmol to three dimensional structure of protein
37	Exploring nucleic acid databases
38	Separation of plant pigments by adsorption chromatography
39	Study of Human genome project
40	Determination of total dissolved solid from waste water sample
	Practical VI
	Project

B.Sc III CBCS
Semester -V SEC Paper III
Entrepreneurship Development (Sec -Sc)

COS: On completion of the course, students will be able to:

CO:1. students get knowledge about business organizations by completing the course students can incubate their business idea

CO:2. Students can understand concepts of business finance. Students can become successful entrepreneurs.

Credit I	INTRODUCTION	10
	Meaning, Needs and Importance of Entrepreneurship, Promotion of entrepreneurship, Factors influencing entrepreneurship, Features of a successful Entrepreneurship.	
	ESTABLISHING AN ENTERPRISE	12
	Forms of Business Organization, Project Identification, Selection of the product, Project formulation, Assessment of project feasibility.	
Credit II	FINANCING THE ENTERPRISE	15
	Importance of finance / loans and repayments, Characteristics of Business finance, Fixed capital management: Sources of fixed capital, working capital its sources and how to move for loans, Inventory direct and indirect raw materials and its management.	
	MARKETING MANAGEMENT	10
	Meaning and Importance, Marketing-mix, product management - Product line, Product mix, stages of product like cycle, marketing Research and Importance of survey, Physical Distribution and Stock Management.	
SUGGESTED READINGS:		
1. Holt DH. Entrepreneurship: New Venture Creation.		
2. Kaplan JM Patterns of Entrepreneurship.		
3. Gupta CB, Khanka SS. Entrepreneurship and Small Business Management, Sultan Chand & Sons.		

B.Sc. III CBCS
Semester VI SEC Paper IV

Ecology And Environment Management (SEC - SF)

COs : On completion of the course, students will be able to:

CO1:Energy transfer in the ecosystem, To understand different industrial indicators of pollution

CO2:Able to understand concepts of ecosystem and able to illustrate bioremediation to abatement of pollution

	Credit I	
	<p>Our Environment: Geological consideration of Atmosphere, Hydrosphere, Lithosphere. Scope of Ecology. Development & Evolution of Ecosystem. Principles & Concepts of Ecosystem.</p> <p>Structure of ecosystem. Strata of an ecosystem. Types of ecosystem including habitats.</p> <p>Biological control of chemical environment.</p> <p>Energy transfer in an Ecosystem. Food chain, food web, Energy budget, Production & decomposition in a system.</p> <p>Ecological efficiencies, trophic structure & energy pyramids, Ecological energetic, Bio-geochemical cycles (N,C,P cycles)</p>	15
	Credit II	
	<p>Pollution & environmental Health related to Soil, Water, Air, Food, Pesticides, Metals, Solvents, Radiations ,Carcinogen, Poisons. Detection of Environmental pollutant. Indicators & detection systems. Bio-transformation, Plastic, Aromatics, Hazardous wastes Environmental cleanup</p> <p>Environmental biotechnologies, Biotechnologies in protection and preservation of environment.</p> <p>Bioremediation, Waste disposal</p>	15
	Practical	
1	Study of all the biotic and abiotic components of any simple ecosystem natural pond or terrestrial ecosystem or human modified ecosystem.	
2	Study of the types of soil, their texture by sieve method and rapid tests for pH, chlorides, nitrates, carbonates and organic carbon	
3	Principle of GPS (Global Positioning System).	
4	Study any five endangered/ threatened species- one from each classes	

Evaluation Pattern
SCHEME OF MARKING FOR (THEORY)

Sem	Core Course	Marks	Evaluation	Sections	Answer Books	Standard of passing
5	DSE-1009-E1	80	Semester wise	Two sections each of 40 marks	As per instruction	35% (28 marks)
5	DSE-1009-E2	80	Semester wise	Two sections each of 40 marks	As per instruction	35% (28 marks)
6	DSE- 1009 F1	80	Semester wise	Two sections each of 40 marks	As per instruction	35% (28 marks)
6	DSE- 1009 F2	80	Semester wise	Two sections each of 40 marks	As per instruction	35% (28 marks)

SCHEME OF MARKING (CIE) Continues Internal Evaluation

Sem	Core Course	Marks	Evaluation	Sections	Answer Books	Standard of passing
5	DSE-1009-E1	20	Semester wise	One	As per instruction	35% (7marks)
5	DSE-1009-E2	20	Semester wise	One	As per instruction	35% (7marks)
6	DSE- 1009 F1	20	Semester wise	One	As per instruction	35% (7marks)
6	DSE- 1009 F2	20	Semester wise	One	As per instruction	35% (7marks)

SCHEME OF MARKING (PRACTICAL)

Sem	Course	Marks	Evaluation	Section	Standard of passing
V and VI	Practical III,IV,V,VI	200	Annual	As per instruction	35% (72marks)

*A separate passing is mandatory

Nature of Question Paper (Theory)

Instructions

1. All the questions are compulsory.
2. Figures to the right indicates full marks.
3. Draw neat labelled diagram wherever necessary.

Time: 3Hrs

Total Marks: 80

SECTION -I

Q.1. Choose the correct alternative and rewrite the sentences. (8 Marks)

- | | | | | |
|-------|----|----|----|----|
| i. | a) | b) | c) | d) |
| ii. | a) | b) | c) | d) |
| iii. | a) | b) | c) | d) |
| iv. | a) | b) | c) | d) |
| v. | a) | b) | c) | d) |
| vi. | a) | b) | c) | d) |
| vii. | a) | b) | c) | d) |
| viii. | a) | b) | c) | d) |

Q. 2. Attempt any two. (16 Marks)

- i.
- ii.
- iii.
- iv.

Q. 3. Attempt any four.

(16 Marks)

i.

ii.

iii..

iv.

v.

vi.

SECTION II

Q. 4. Choose the correct alternative and rewrite the sentences. (8 Marks)

i.

a)

b)

c)

d)

ii.

a)

b)

c)

d)

iii.

a)

b)

c)

d)

iv.

a)

b)

c)

d)

v.

a)

b)

c)

d)

vi.

a)

b)

c)

d)

vii.

a)

b)

c)

d)

viii.

a)

b)

c)

d)

Q. 5. Attempt any two.

(16 Marks)

i.

ii.

iii..

Q. 6. Attempt any four.

(16 Marks)

- i.
- ii.
- iii.
- iv.
- v.
- vi.

Instructions to paper setters : Equal weight age should be given to all units

For Continues Internal Evaluation : (20 Marks)

Mandatory 1) Presenty----- (5 marks)

Select any one for B.Sc.III----- (15 marks)

- 1) Unit test
- 2) Home assignment
- 3) **Project**
- 4) Seminar

*Yet it is not finalized

NATURE OF QUESTION PAPER AND DISTRIBUTION OF MARKS

PRACTICAL EXAMINATION

Practical III, IV, V,VI

First day

Q.1 Major experiment 20

Q.2 Minor experiment 10

Q.3 Spotting 10

Q.4 Viva-voce 10

Second day

Q.5 Major experiment 20

Q.6 Minor experiment 10

Q.7 Minor experiment 10

Q.8 Journal 10

Third day

Q.1 Major experiment 20

Q.2 Minor experiment 10

Q.3 Spotting 10

Q.4 Viva-voce 10

Practical VI -Project presentation for50M

- | | |
|-------------------------|-----|
| 1. Project report | 25M |
| 2. Project Presentation | 15M |
| 3. Oral | 10M |

TOTAL MARKS

**“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe**

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)**



DEPARTMENT OF MICROBIOLOGY

**B.Sc. Part - III
Semester-V&VI**

SYLLABUS

Under Choice Based Credit System

To be implemented from Academic Year 2020-2021

B.Sc.-III (Sem -V and VI) Microbiology

Course Structure

Paper No.	Course code	Title of Old Paper	Title of New Paper	Percentage of Change (%)	No. of Credits
Semester V					
V	DSE-1010E1	Immunology and Clinical Microbiology	Immunology and Medical Microbiology	20	4
VI	DSE-1010E2	Industrial Microbiology and Microbial Biochemistry	Industrial Microbiology and Microbial Biochemistry	15	4
SEC	SEC	-	Management of Human Microbial Diseases		
		English	English	-	
Semester VI					
VII	DSE-1010F1	Virology and Microbial Genetics	Virology and Microbial Genetics	20	4
VIII	DSE-1010F2	Agricultural and Environmental Microbiology	Agricultural and Environmental Microbiology	15	4
			Food Fermentation Techniques		
		English	English		

B. Sc. Part – III CBCS
Semester – V Paper- V
Immunology and Medical Microbiology (DSE 1010E1)
Theory: 60 Hours **Credits- 4**

Section I and II

Course Outcomes: Upon successful completion of course, students are expected to be able to –

CO1: Understand the overall organization of the Immune system.

CO2: Understand the salient features of antigen antibody reaction & its use in diagnostics and in various other studies.

CO3: Understand various viral, bacterial & fungal diseases, their causative agent , mode of infection , epidemiology lab diagnosis , treatment and prophylaxis.

CO4: Explain different antimicrobial agents with respect to their mode of action uses.

Unit	SECTION I: IMMUNOLOGY	Lectures/ Teaching Hours	Credits
Module 1	1.Cells of Immune system – a.Hematapoiesis-characteristics & types of stem cells. b.Classification of cells of immune system – lymphoid & myeloid cells. c. Structure & function of lymphoid cells – T cell & T cell subsets,NK cells,B cells & dendritic cells. d. Structure & function of myeloid cells- Granulocytes, monocytes & macrophages. 2. Membrane receptors for antigen and their role in antigen recognition a. B cell surface receptor for antigen (BCR) b. T cell surface receptor for antigen (TCR) c. NK receptors 3. Molecular mechanism of antibody production. a. Processing and presentation of antigen by Antigen presenting cell.	15	2

	<ul style="list-style-type: none"> b. Interaction of APC with T_H Cell. c. Interaction of B cell and T_H Cell d. Clonal proliferation and differentiation of activated B cell. e. Role of follicular dendritic cells in selection of high affinity B cell. f. Role of cytokines in proliferation and differentiation. <p>4. Cytokines -</p> <ul style="list-style-type: none"> a. Properties , types and function of cytokines produced by TH cell and Macrophages <p>5. Immunological tolerance :</p> <ul style="list-style-type: none"> a.Tolerance induction in adults and neonates by drug and monoclonal antibody b. Cellular mechanism of immunological tolerance. c. Termination of tolerance. <p>6. Interferon -</p> <ul style="list-style-type: none"> a.Nature and types of Interferons b.Induction of Interferon c.Mechanism of action. 		
Module2	<p>1. Complement -</p> <ul style="list-style-type: none"> a.Nature and Properties of Complement b.Complement activation by classical and alternate pathway. c. Biological consequences of complement activation. <p>2.Monoclonal antibodies -</p> <ul style="list-style-type: none"> a. Basic concepts - Mouse, Human and Humanized antibodies. b. Production of monoclonal antibodies by 	15	2

	<p>hybridoma technology.</p> <p>c. Production of Humanized Monoclonal antibodies by recombinant DNA technology.</p> <p>d. Applications of monoclonal antibodies in diagnosis, treatment and research.</p> <p>3. New diagnostic techniques :-</p> <p>a. RIA</p> <p>b. Dot Blot Technique</p> <p>4. Hypersensitivity -</p> <p>a. Basic concept, Gell and Coombs classification</p> <p>b. Type I - Anaphylaxis</p> <p>c. Type II - Blood transfusion reactions</p> <p>d. Type III - Serum sickness</p> <p>e. Type IV - Delayed type hypersensitivity - Allograft rejection.</p> <p>5. Autoimmune disease:</p> <p>a. Types of autoimmune diseases.</p> <p>b. Treatment of autoimmune diseases.</p>		
	SECTION II: MEDICAL MICROBIOLOGY		
Module 1	<p>1. Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by -</p> <p>a. <i>Mycobacterium leprae</i></p> <p>b. <i>Clostridium perfringens</i>,</p> <p>c. <i>Treponema pallidum</i></p> <p>2. Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by -</p>		

	<p>a. <i>Pseudomonas aeruginosa</i></p> <p>b. <i>Vibrio cholera</i></p> <p>c. <i>Leptospira interrogans</i></p> <p>d. <i>Helicobacter pylori</i></p>		
Module 2	<p>1. Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by -</p> <p>a. Protozoa : <i>Plasmodium falciparum</i> (malaria)</p> <p>b. Viruses : i) Hepatitis A & B virus</p> <p>ii) Rabies virus</p> <p>iii) Dengue virus</p> <p>iv) SARS</p> <p>c Fungi : <i>Candida albicans</i></p> <p>2. Chemotherapy</p> <p>a. General principles of chemotherapy</p> <p>b. Mode of action of Penicillin, Streptomycin, Bacitracin, Piperacillin, cycloserine, Tetracycline, sulphonamide and Quinolones on microorganisms.</p> <p>c. Antiviral drug : AZT</p> <p>d . Antifungal drugs : Ketoconazole, Griesofulvin, Nystatin.</p> <p>e. Antiprotozoal drugs : Metronidazole , Mepacrine</p> <p>f. Mechanism of drug resistance</p> <p>g. Chemoprophylaxis</p> <p>3 . Gene therapy – Concept, advantages & disadvantages.</p> <p>4 . Immunoprophylaxis – Vaccines and Immune Sera</p> <p>a. Vaccines - live attenuated , heat killed , subunit, conjugate and DNA vaccines</p>		

Reference Books:**A. For Immunology**

- 1) Immunology - 6th edition - Kubay ,Kindt, Goldsby & Osborne.
- 2) Essential Immunology - 11th edition - Delves, Martin, Burton and Roitt.
- 3) Immunology - An Introduction, 4th edition – Tizzard.
- 4) Basic and Clinical Immunology 5th edition- Stites, Stobo, H. H. Fudenberg.
- 5) Essentials of Immunology - S. K. Gupta
- 6) Immunology – M. P. Arora

B. For Medical Microbiology

- 1) Microbiology - Davis
- 2) Immunology & serology - Ashim Chakravarty
- 3) Medical Microbiology 16th edition by David Greenwood, Richard C B Slack, John Peutherer
- 4) Medical Bacteriology - Dey & Dey
- 5) Medical Bacteriology including Medical Mycology & AIDS - NC Dey & T. K. Dey
- 6) Principals and Practice of Clinical Bacteriology – A.M. Emmerson

B. Sc. Part – III CBCS
Semester – V Paper- VI
Industrial Microbiology and Microbial Biochemistry (DSE 1010E2)

Theory: 60 Hours

Credits-4

Section I and II

Course Outcomes:- Upon successful completion of the course, the students will be able to:

CO1: Understand metabolic pathways and Bioenergetics

CO2: Describe various downstream processing

CO3: Explain basic concept related to enzyme

CO4: Understand enzyme production and determination of its activity

Unit	SECTION I	Lectures/ Teaching Hours	Credits
Module 1	<p>1 .Food Microbiology</p> <p>a. Food as a substrate for microorganisms.</p> <p>b. Food born diseases – I. Role of microorganisms in food born diseases</p> <p style="padding-left: 40px;">II. Food poisoning - i)</p> <p style="padding-left: 80px;">Staphylococcal</p> <p style="padding-left: 80px;">ii) Fungal (aflatoxin)</p> <p style="padding-left: 40px;">III. Food infections –</p> <p>Salmonellosis.</p> <p>2. Industrial Microbiology</p> <p>a. Strain Improvement</p> <p>b. Scale up of fermentations</p> <p>c. Microbiological assays</p> <p>d. Preservation of industrially important microorganisms - Methods, Culture collection centers</p>	15	2
Module2	<p>1. Industrial production of -</p> <p>a. Amylase - Organisms used, Inoculum preparation, Fermentation media, Fermentation conditions, Extraction and</p>	15	2

	<p>Recovery.</p> <p>b. Grape wine - Definition, types, production of table wine (Red and White), microbial defects of wine</p> <p>c. Penicillin - Organisms used, Inoculum preparation, Fermentation media, Fermentation conditions, Extraction and Recovery. Concept of semi synthetic penicillin</p> <p>d. Citric acid - Organisms used, Inoculum preparation, Fermentation media, Fermentation conditions, Extraction and Recovery.</p> <p>e. SCP by using yeast</p> <p>2. Microbial Production of -</p> <p>a. Vitamins - Vit. B₁₂</p> <p>b. Amino acids - Lysine</p> <p>3. Probiotics- Concept, Production by using <i>Lactobacillus</i> and applications</p> <p>4. Downstream processing & product recovery-</p> <p>a. Centrifugation</p> <p>b. Flocculation</p> <p>c. Filtration</p> <p>d. Solvent extraction</p> <p>e. Distillation</p> <p>f. Precipitation</p> <p>g. Crystallization</p> <p>h. Chromatography.</p> <p>5. Testing of sterility, pyrogen, carcinogenicity, toxicity and allergens</p>		
SECTION II: MICROBIAL BIOCHEMISTRY			
Module 1	1. Enzymes -		

- a. Definition, properties, structure, specificity, classification and mechanism of action (Lock & Key, Induced fit hypothesis)
- b. Allosteric enzymes - Definition, properties, models explaining mechanism of action.
- c. Ribozymes -concept ,significance.
- d. Isozymes- definition, properties,example.
- e. Factors affecting catalytic efficiency of enzymes
 - i. Proximity and orientation
 - ii. Strain and distortion.
 - iii. Acid base catalysis
 - iv. Covalent catalysis
- f. Enzyme kinetics - Derivation of Michaelis-Menten equation, Lineweaver Burk Plot, Significance of K_m and V_{max} .
- g. Regulation of enzyme synthesis.
 - i. Positive control -Ara operon
 - ii. Negative control -Lac operon
 - iii. Catabolite repression

2. Extraction & purification of enzymes.

- a. Methods of extraction of intracellular and extracellular enzymes.
 - i. Choice of source and biomass development
 - ii. Methods of homogenization - cell disruption methods
 - iii. Purification of enzymes on the basis of -
 - Molecular size
 - Solubility differences
 - Electrical charge
 - Adsorption characteristic differences

	<p>3. Assay of enzymes - Based on substrate and product estimation.</p> <p>4. Immobilization of enzymes - Methods & applications</p> <p>5. Confirmation of purified enzymes</p>		
Module 2	<p>1. Basic concepts of -</p> <p>a. Glyoxylate bypass</p> <p>b. Phosphoketolase pathway</p> <p>c. Bioluminescence – Occurrence, mechanism & applications.</p> <p>2. Assimilation of -</p> <p>a. Carbon</p> <p>b. Nitrogen with respect to N₂ and NH₃ (GOGAT)</p> <p>c. Sulphur</p> <p>3. Prokaryotic Biosynthesis of -</p> <p>a. RNA</p> <p>b. DNA</p> <p>c. Proteins</p> <p>d. Peptidoglycan</p>		

Reference Books:

A. For Food microbiology and industrial microbiology

1. Principles of fermentation technology- Peter F. Stanbury & Allan Whitaker (Pergamon Press).
2. Principles of Microbial technology - Pepler, Vol. I & II.
3. Industrial Microbiology - Casida
4. Industrial Microbiology - A. H. Patel
5. Industrial Microbiology - Prescott & Dunn
6. Industrial Microbiology - Miller
7. Pharmaceutical Microbiology - Huggo & Russel
8. Food Microbiology – Frazier

B. For Microbial Biochemistry

1. Enzymology - Prise & Stevens

2. Enzymes - Biochemistry, Biotechnology, clinical chemistry - Trevor Palmer.
3. Enzymes - Dixon and Webb
4. Lehnigers Principles of Biochemistry by David Nelson & Michale Cox, Fifth edition.
5. General Microbiology - Stanier
6. Principles & techniques of Biochemistry - Wilson & Walker, 6th edition.
7. Biochemistry - Lubert Stryer

SEC-SE	<p style="text-align: center;">Management of Human Microbial Diseases Theory :30 Hours (Credits -2)</p>	<p style="text-align: center;">No. of Hours per unit/ credit</p>
<p style="text-align: center;">Expected course outcome -</p> <p style="text-align: center;">Upon successful completion of course, students are expected to be able to -</p> <ul style="list-style-type: none"> ▪ Explain the causes of immune deficiency diseases. ▪ Understand the cause and transmission of diseases. ▪ Design the diagnostic test and therapeutic agents. ▪ Apply their knowledge to prevent diseases. 		
<p>UNIT I</p>	<p>a. Human Diseases</p> <p>Infectious and non infectious diseases, microbial and non microbial diseases, Deficiency diseases, occupational diseases, Incubation period, mortality rate, nosocomial infections</p> <p>b. Microbial diseases</p> <p>Respiratory microbial diseases, gastrointestinal microbial diseases, Nervous system diseases, skin diseases, eye diseases, urinary tract diseases, Sexually transmitted diseases: Types, route of infection, clinical systems and general prevention methods, study of recent outbreaks of human diseases (SARS/ Swine flu/Ebola) – causes, spread and control, Mosquito borne disease – Types and prevention.</p>	<p style="text-align: center;">15</p>
<p>UNIT II</p>	<p>a. Therapeutics of Microbial diseases</p> <p>Judicious use of antibiotics, importance of completing antibiotic regimen, Concept of DOTS, emergence of antibiotic resistance, current issues of MDR/XDR microbial strains.</p> <p>Treatment using antiviral agents: Amantadine, Acyclovir, Azidothymidine. Concept of HAART.</p> <p>b. Prevention of Microbial Diseases</p> <p>General preventive measures, Importance of personal hygiene, environmental sanitation and methods to prevent the spread of infectious agents transmitted by direct contact, food, water and insect</p>	<p style="text-align: center;">15</p>

	vectors.	
	Reference Books - 1. Ananthanarayan R. and Paniker C.K.J. (2009) Textbook of Microbiology. 8th edition, University Press Publication 2. Willey JM, Sherwood LM, and Woolverton CJ. (2013) Prescott, Harley and Klein's Microbiology. 9th edition. McGraw Hill Higher Education	

B. Sc. Part - III CBCS
Semester - VI Paper- VI
Virology and Microbial Genetics (DSE 1010F1)
Theory: 60 Hours

Credits-4

Section I and II

Course Outcomes: After the completion of the course the student will be able to -

CO1: Describe various stages involved in multiplication cycle of viruses

CO2: Understand methodological approaches in isolation, cultivation & purification of viruses.

CO3: Understand molecular mechanism involved in gene regulation

CO4: Explain techniques used to manipulate genes & formation of clones.

Unit	SECTION I: VIROLOGY	Lectures/ Teaching Hours	Credits
Module 1	<p>1. a. The Structural properties of viruses: Capsids, Nucleic acids and envelope.</p> <p style="padding-left: 20px;">b. Structure of T4 bacteriophage, TMV and HIV, Viroids & prions.</p> <p style="padding-left: 20px;">c. One step growth experiment.</p> <p>2. Isolation, cultivation and Purification of viruses</p> <p style="padding-left: 20px;">a. Isolation and cultivation of viruses -</p> <p style="padding-left: 40px;">i. Animal virus - Tissue culture, chick embryo and live animals.</p> <p style="padding-left: 40px;">ii. Plant virus - Protoplasts, Insect tissue culture</p> <p style="padding-left: 40px;">iii. Bacteriophages - Plaque method.</p> <p style="padding-left: 20px;">b. Purification of viruses using physico-chemical properties</p> <p style="padding-left: 40px;">i. Density gradient centrifugation</p> <p style="padding-left: 40px;">ii. Precipitation</p> <p>3. Methods of Enumeration of viruses</p> <p style="padding-left: 20px;">i. Latex droplet method (Direct microscopic count)</p> <p style="padding-left: 20px;">ii. Plaque and pock method.</p>	15	2

Module2	<p>1. a) Lysogeny - Definition of lysogeny and temperate phage, types, lysogeny by lambda phage - adsorption & penetration, genetic map for lysogenic interaction, expression of λ genes, establishment of repression, maintenance of repression, integration of λ genome in host chromosome.</p> <p>b. Reproduction of animal viruses - Adenovirus.</p> <p>c. Reproduction of plant viruses - TMV</p> <p>d. Reproduction of T4 phage.</p> <p>2. Oncogenesis :</p> <p>a. Definition of oncogenesis</p> <p>b. Types of cancer</p> <p>c. Characteristics of cancer cells.</p> <p>d. Hypothesis about cancer.</p> <p style="padding-left: 40px;">I . Somatic mutation hypothesis</p> <p style="padding-left: 40px;">II . Viral gene hypothesis</p> <p style="padding-left: 80px;">i.Role of DNA viruses with special emphasis on Papova viruses.</p> <p style="padding-left: 80px;">ii.Role of RNA tumor viruses</p> <p style="padding-left: 80px;">iii. Provirus theory, Protovirus theory, Oncogene theory.</p> <p style="padding-left: 40px;">III . Defective immunity hypothesis.</p>	15	2
---------	--	----	---

Unit	SECTION II: MICROBIAL GENETICS	Lectures/ Teaching Hours	Credits
Module 1	<p>1. One cistron - one polypeptide hypothesis.</p> <p>2. Molecular mechanism of gene expression</p> <p style="padding-left: 40px;">a. Concept of operon</p>	15	2

	<ul style="list-style-type: none"> b. Pribnow box c. Genetic regulation in tryptophan operon <p>3. Mutations</p> <ul style="list-style-type: none"> a. Expression of mutations - <ul style="list-style-type: none"> i. Time course of phenotypic expression. ii. Conditional expression of mutation. b. Suppressor mutations (with examples) - Genetic and non-genetic. <p>4. Methods of isolation and detection of mutants based on -</p> <ul style="list-style-type: none"> a. Relative survival b. Relative growth c. Visual detection 		
Module2	<p>1. Genetic complementation - Cis-trans test</p> <p>2. Extrachromosomal inheritance:</p> <ul style="list-style-type: none"> a. Kappa particles. b. Transposable elements - general properties and types. <p>3. Techniques in Molecular Biology -</p> <ul style="list-style-type: none"> a. DNA sequencing (Sanger's method) b. DNA Finger printing c. PCR d. Blotting techniques- Southern, Western, Northern <p>4. Genetic engineering</p> <ul style="list-style-type: none"> a. Introduction b. Tools of genetic engineering - <ul style="list-style-type: none"> i. Enzymes ii. Vectors-phage, plasmid and cosmid iii. DNA probe - methods of preparation and detection. 	15	2

	<ul style="list-style-type: none"> iv. Linkers and adaptors v. Cloning organisms - (Bacteria and Yeasts) vi. Genomic library and cDNA library c. Techniques - <ul style="list-style-type: none"> i. Isolation of desired DNA segment- Shotgun Method, cDNA synthesis, Chemical synthesis ii. Construction of r-DNA using appropriate vector- Use of restriction enzymes, Linkers, Adaptors Homopolymer tails iii. Transfer to cloning organisms (Bacteria and Yeasts) iv. Selection of recombinant bacteria and yeasts - Blue and white screening, Colony hybridization technique. d. Application of genetic engineering in - <ul style="list-style-type: none"> i. Medicine- ii. Agriculture iii. Industry iv. Environment v. Understanding biology 		
--	--	--	--

Reference Books:

A. For Virology

1. General Microbiology - Stanier
2. Microbiology - Prescott, Klein
3. Microbiology - Davis
4. General Virology - Luria
5. Genetics of Bacteria and their Viruses - William Hayes.
6. General Microbiology Vol. II - Powar and Daginawala
7. Virology - Biswas and Biswas

B. For Genetics

1. Genetics - Stickberger.
2. Genes - Benjamin Lewin IX ed.
3. Principles of gene manipulation - Primrose and Old
4. Genetic Engineering - Second Ed. Desmond S. T. Nicholl
5. Recombinant DNA - J. D. Watson
6. Biochemistry - Lehninger
7. Molecular Biology of Gene - J. D. Watson

**B. Sc. Part - III CBCS
Semester - VI Paper- VI**

Agricultural and Environmental Microbiology (DSE 1010F2)

Theory: 60 Hours

Credits-4

Section I and II

Course Outcomes: After the completion of the course the student will be able to -

CO1: Understand various plant microbe interactions especially rhizosphere , phyllosphere and mychorrhizae and their applications especially the biofertilizers and their production techniques

CO2: Understand various biogeochemical cycles - C,N,P cycle and microbes involved

CO3: Understand the basic principle of environment microbiology and be able to apply these principles to understanding and solving environmental problems - waste water treatment and bioremediation.

CO4: Know the Microorganisms responsible for water pollution and their transmission.

Unit	SECTION I: AGRICULTURAL MICROBIOLOGY	Lectures/ Teaching Hours	Credits
Module 1	<p>1. Soil Microbiology.</p> <ul style="list-style-type: none"> a. Physical characters. b. Chemical characters. c. Types of microorganisms in soil and their role in soil fertility. d. Microbiological interactions - Symbiosis, Commensalism, Amensalism, Parasitism, Predation. <p>2. Role of microorganisms in elemental cycle</p> <ul style="list-style-type: none"> e. Carbon cycle. f. Nitrogen cycle g. Phosphorous cycle h. Sulfur cycle <p>3. Manure and Compost</p> <ul style="list-style-type: none"> a. Methods of Production - 	15	2

	<ul style="list-style-type: none"> i. Green manure and farm yard manure ii. City compost- Windrow and pit method. iii Vermicompost <p>b. Optimal conditions for composting with reference to - Composition of organic waste, Availability of microorganisms, Aeration, C:N:P ratio, Moisture content, Temperature, pH, Time.</p> <p>C. Standards of City Compost and Vermicompost as per Fertilizer Control order.</p>		
Module2	<p>1. Types, production, methods of application and uses of -</p> <ul style="list-style-type: none"> a. Biofertilizers <ul style="list-style-type: none"> i. Nitrogen fixing - Azotobacter, Rhizobium, Azospirillum. ii. Phosphate Solubilizing Microorganisms. b. Biopesticides <ul style="list-style-type: none"> i. <i>Bacillus thuringiensis</i> ii. <i>Trichoderma spp.</i> <p>2. Biodegradation by bacteria & fungi-</p> <ul style="list-style-type: none"> a. Cellulose b. Pesticides <p>3. Plant Pathology</p> <ul style="list-style-type: none"> a. Common symptoms produced by plant pathogens b. Modes of transmission of plant diseases. c. Plant diseases- <ul style="list-style-type: none"> i. Citrus Canker ii. Tikka disease of groundnut iii. Bacterial Blight of Pomegranate. iv. Control of plant disease caused by bacteria. 	15	2

Unit	SECTION II: ENVIRONMENTAL MICROBIOLOGY	Lectures/ Teaching Hours	Credits
Module 1	<p>1.General characteristics of waste-</p> <ul style="list-style-type: none"> a. Liquid waste - pH, electrical conductivity, COD, BOD, total solids, total dissolved solids, total suspended solids, total volatile solids, chlorides, sulphates, oil & grease. b. Solid waste- pH, electrical conductivity, total volatile solids, ash. c. Standards as per MPCB <p>2. Sewage Microbiology</p> <ul style="list-style-type: none"> a. Physico-chemical and Biological characteristics b. Treatment methods- <ul style="list-style-type: none"> i. Physical treatment: Screening, Sedimentation ii. Biological treatment: Trickling filter, Activated sludge process, Oxidation ponds, Anaerobic digestion (Biomethanation), Septic tank. iii. Chemical treatment - Chlorination <p>3.Characteristics and treatment of waste generated by</p> <ul style="list-style-type: none"> a. Sugar Industry b. Dairy Industry <p>4.Eutrophication</p> <ul style="list-style-type: none"> a. Classification of lakes b. Sources c. Consequences d. Control 	15	2

Module2	<p>1. Biological safety in laboratory</p> <ul style="list-style-type: none"> a. Good Laboratory Practices b. Bio safety levels (BSL) <p>2. Environmental monitoring</p> <ul style="list-style-type: none"> a. Definition and purpose b. Cleanroom- Concept, classification, prevention of contamination in clean rooms c. Routine Environmental monitoring programme in pharmaceutical industries- Air monitoring, Surface monitoring and Personnel monitoring. d. Bioburden test <p>3. Environmental Impact Assessment- Concept and Brief introduction</p> <p>4. Bioremediation and Bioleaching</p> <ul style="list-style-type: none"> a. Bioremediation <ul style="list-style-type: none"> i. Definition ii. Types iii. Applications. b. Bioleaching <ul style="list-style-type: none"> i. Introduction ii. Microorganisms involved iii. Chemistry of Microbial leaching iv. Laboratory scale and pilot scale leaching v. In situ leaching - Slope, heap vi. Leaching of Copper and Uranium 	15	2
---------	--	----	---

Reference books:

A. For Agricultural Microbiology

1. Soil Microbiology - An exploratory approach - Mark Coyne.
2. Agricultural Microbiology - N. Mukherjee and J. Ghosh.
3. Introduction to Soil Microbiology - Martin Alexander IInd Edition.
4. Agricultural Microbiology - Rangaswamy and Bhagyaraj IInd Edition

5. Plant diseases - R. S. Singh.
6. Diseases of crop plants in India - G. Rangaswamy.
7. Soils and Soils Fertility- 6th dition-ederick R.Troeh (Blackwell publishing Co.) 8. Soil Microbiology- Singh, Purohit, Parihar. (Agrobios India , 2010)
- 9. Soil Microbiology and Biochemistry - Ghulam Hassan Dar (New India Publishing Agency, 2010)**

B. For Environmental Microbiology

1. Environmental Pollution by Chemicals - Walker, Hulchiason.
2. Biochemistry and Microbiology of Pollution - Higgins and Burns.
3. Environmental Pollution - Laurent Hodge, Holt.
4. Waste Water Treatment - Datta and Rao (Oxford and IBH)
5. Sewage and waste treatment - Hammer
6. Environment Chemical Hazards - Ram Kumar (Swarup and Sons, New Delhi).
7. Environment Pollution - Timmy Katyal (Satke Anmol Pub. New Delhi).
8. Ecology of Polluted Water - Vol. II - Anand Kumar (Aph Pub. Co. New Delhi).
9. Environment Pollution and Management of waste waters by
Microbial Techniques - Pathade and Goel (ABD Pub. Jaipur).
10. Current Topics in Environmental Sciences - Tripathi and Pandey (ABD Pub. Jaipur).
11. Environmental Impact Assessment - R. K. Trivedy
12. Microbial Limit and Bioburden Tests, 2nd edition - Lucia Clontz (CRCpress

SEC-SF	<p style="text-align: center;">FOOD FERMENTATION TECHNIQUES</p> <p style="text-align: center;">Theory :30 Hours (Credits -2)</p>	<p style="text-align: center;">No. of Hours per unit/ credit</p>
<p style="text-align: center;">Expected course outcome -</p> <p style="text-align: center;">Upon successful completion of course ,students are expected to be able to -</p> <ul style="list-style-type: none"> ▪ Understand the role of microorganisms in fermentation process ▪ Start small scale food industry ▪ Apply their knowledge in designing techniques for food processing ▪ Explain the role and health benefits of microorganism in probiotic food. 		
<p>UNIT I</p>	<p>1. Fermented Foods Definition, types, advantages and health benefits</p> <p>2. Milk Based Fermented Foods Dahi, Yogurt, Buttermilk (Chach) and cheese: Preparation of inoculums, types of microorganisms and production process</p> <p>3. Grain Based Fermented Foods Soy sauce, Bread, Idli and Dosa: Microorganisms and production process</p>	<p style="text-align: center;">15</p>
<p>UNIT II</p>	<p>1. Vegetable Based Fermented Foods Pickles, Sauerkraut: Microorganisms and production process</p> <p>2. Fermented Meat and Fish Types, microorganisms involved, fermentation process</p> <p>3. Probiotic Foods Definition, types, microorganisms and health benefits</p>	<p style="text-align: center;">15</p>
<p>Reference Books -</p> <p>1.Yadav JS, Grover, S and Batish VK (1993) A comprehensive dairy microbiology, Metropolitan</p> <p>2.Jay JM, Loessner MJ, Golden DA (2005) Modern Food Microbiology, 7th edition. Springer</p>		

B. Sc. Part - III CBCS
Semester - V
MICROBIOLOGY LAB (II): Course Code (Practical)
Name of the Practical Course
60 Hours (...lectures of...minutes)-Credits- 4.

ATLEAST.....EXPERIMENTSEACHFROMSECTIONA, B

PRACTICAL I: IMMUNOLOGY AND MEDICAL MICROBIOLOGY

Major :

1. Isolation of following pathogens from clinical samples (wherever possible) and identification of the same by morphological, cultural and biochemical characteristics.
 - a. *Pseudomonas aeruginosa*
 - b. *Klebsiella pneumoniae*
 - c. *Candida albicans*
2. Determination of MIC of streptomycin against *E.coli* by broth method

Minor :

1. Determination of sensitivity of common pathogens to antibiotics by paper disc method.
2. Serological tests:
 - a. Widal test - Quantitative
 - b. Demonstration of Enzyme Linked Immunosorbent Assay (ELISA)
3. Haematology :
 - a. Estimation of haemoglobin by Sahli's method.
 - b. Determination of ESR of the blood sample (Westergren method)
 - c. Determination of PCV
 - d. Total and differential blood cells count.
4. Urine analysis
 - a. Physical and chemical examination of urine.
 - b. Test for protein (Acetic acid test)
 - c. Test for ketone bodies (Rothra's test)
 - d. Test for bile salt.

PRACTICAL II: FOOD AND INDUSTRIAL MICROBIOLOGY

Major :

1. Assay of amylase by DNSA method (graphical estimation)
2. Bio-assay of Vitamin B12
3. Bio-assay of Penicillin.
4. Microbial testing of Water:
 - a. Presumptive, confirmed and completed test.
 - b. MPN
 - c. **SPC of tomato sauce.**
5. **Production of wine and examination for pH, colour and alcohol content.**

Minor:

1. Citric acid fermentation, recovery and estimation by titration.
2. Amylase production by using *Bacillus* species.
3. Isolation of lactic acid bacteria from fermented food.
4. Examination of milk by Direct microscopic count (DMC)
5. Sauerkraut production.

B. Sc. Part - III CBCS
Semester - VI
MICROBIOLOGY LAB (II): Course Code (Practical)
Name of the Practical Course
60 Hours (...lectures of...minutes)-Credits- 4.

ATLEAST.....EXPERIMENTSEACHFROMSECTIONA, B

PRACTICAL III: VIROLOGY AND MICROBIAL GENETICS

Major :

1. Isolation of coliphages from sewage.
2. Effect of U.V. light on bacteria and graphical presentation of result.
3. Isolation of auxotrophic mutants by replica plate technique
4. Transfer of genetic material by transformation in *E.coli*
5. Isolation of chromosomal DNA from bacteria (J. Marmurs method)

Minor :

1. Electrophoretic separation of DNA.
2. Isolation of streptomycin - resistant mutants (gradient plate technique)
3. Egg inoculation technique.

PRACTICAL IV: AGRICULTURAL AND ENVIRONMENTAL MICROBIOLOGY

Major :

1. Isolation of Azotobacter from soil.
2. Isolation of Xanthomonas from infected citrus fruit.
3. Isolation of Rhizobium from root nodules.
4. Isolation of phosphate solubilising bacteria from soil.
5. Determination of BOD of sewage

Minor :

1. Determination of texture, color, pH of soil.
2. Estimation of Calcium and Magnesium from soil (EDTA method)
3. Determination of organic carbon content of soil (Walkley and Black method)
4. Determination of COD of sewage.

Reference Books:

1. Medical Lab Technology- Ramnikand Sood, Jaypee brothers(Medical pub. New Delhi)
2. Practical Biochemistry -Plummer
3. APHA(American Public Health Association)Handbook
4. Soil, Plant and Water Analysis-P. C. Jaiswal
5. Biochemical methods-S. Sadasivam, A. Manickam
6. Practical Biochemistry-J. Jayraman
7. Practical Microbiology – R.C. Dubey , D. K. Maheshwari , S. Chand & Co. Ltd.

EVALUATION PATTERN
Scheme of Marking: Theory

Sem.	Core Course	Marks	Evaluation	Sections	Answer Books	Standard of passing
V	DSE E 1	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28 marks)
V	DSE E 2	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28marks)
VI	DSE F1	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28marks)
VI	DSE F2	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28marks)

SCHEME OF MARKING (CIE) Continuous Internal Evaluation

Sem.	Core Course	Marks	Evaluation	Sections	Answer Books	Standard of passing
V	DSE E 1	20	Semester wise	one	As per Instruction	35% (7 marks)
	DSE E 2	20	Semester wise	one	As per Instruction	35% (7 marks)
VI	DSE F1	20	Semester wise	one	As per Instruction	35% (7 marks)
	DSE F2	20	Semester wise	one	As per Instruction	35% (7 marks)

SCHEME OF MARKING (PRACTICAL)

Sem.	Course	Marks	Evaluation	Sections	Standard of passing
V AND VI	Practical I,II,III&IV	200	Annual	As per Instruction	35%

***A separate passing is mandatory**

Nature of Question Paper

- Instructions:** 1) All the questions are **compulsory**.
2) Figures to the right indicate **full** marks.
3) Draw neat labeled diagrams **wherever** necessary.
4) Use of calculator is allowed.

Time : 2 hours

Total Marks: 40

SECTION-I/ SECTION-II

Q.1. Select correct alternative.

(8)

- i) a) b) c) d)
- ii) a) b) c) d)
- iii) a) b) c) d)
- iv) a) b) c) d)
- v) a) b) c) d)
- vi) a) b) c) d)
- vii) a) b) c) d)
- viii) a) b) c) d)

Q.2. Attempt any Two.

(16)

- i)
- ii)
- iii)

Q.3. Attempt any Four

(16)

- i)
- ii)
- iii)
- iv)
- v)

Instruction to paper setters: Equal weight age should be given to all units.

For Continuous Internal Examination: (20 marks)

Mandatory 1) Presenty ---- (5 marks)

***Select any one for B.Sc.II ---- (15 marks)**

- 1) Unit test
 - 2) Home assignment
 - 3) Project
 - 4) Seminar
- *Yet it is not finalized



SHIVAJI UNIVERISTY, KOLHAPUR-416 004. MAHARASHTRA

PHONE : EPABX-2609000 website- www.unishivaji.ac.in

FAX 0091-0231-2691533 & 0091-0231-2692333 – BOS - 2609094

शिवाजी विद्यापीठ, कोल्हापूर – 416004.

दुरध्वनी (ईपीएवीएक्स) २६०९००० (अभ्यास मंडळे विभाग- २६०९०९४)

फॅक्स : ००९१-०२३१-२६९१५३३ व २६९२३३३.e-mail:bos@unishivaji.ac.in

SU/BOS/6060

Date:- 19/06/2019

To,

The Principal,
All Affiliated Colleges/Institutes,
Shivaji University,
Kolhapur

Subject: Regarding syllabi of **Environmental Studies for all under graduate degree Programme Part – II** of all faculties.

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the University authorities have accepted and granted approval to the syllabi of **Environmental Studies for all under graduate degree programme Part – II** of all faculties.

The concerned syllabi shall be implemented from the academic year 2019-20 (i.e. from June, 2019) onwards. All these syllabi are also made available on University website www.unishivaji.ac.in.

You are therefore requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully,

Dy Registrar

Copy to:

1) I/c Dean, All Faculty	6) B.Sc. Section
2) Chairman, Ad-hoc Board of Environmental Studies	7) Computer Centre
3) Appointment Section	8) P.G.Admission
4) Affiliation Section	9) P.G.Seminar.
5) Eligibility Section

SHIVAJI UNIVERSITY, KOLHAPUR.



Accredited By NAAC with 'A' Grade

Syllabus of Environmental Studies

**As a Compulsory Paper for all
Undergraduate Programme**

(To be implemented from academic year 2019)

Shivaji University, Kolhapur
Syllabus of Environmental Studies
as a Compulsory Paper for all Undergraduate Courses
2019-20

- Unit 1. Nature of Environmental Studies :** **(3 lectures)**
 Definition, scope and importance.
 Multidisciplinary nature of environmental studies
 Need for public awareness.
 Concept of sustainability. Sustainable development and it's goals with Indian context.
- Unit 2. Ecosystems :** **(9 lectures)**
 Concept of an ecosystem.
 Structure and function of an ecosystem.
 Producers, consumers and decomposers.
 Energy flow in the ecosystem.
 Ecological succession.
 Food chains, food webs and ecological pyramids.
 Introduction, types, characteristics features, structure and function of the following ecosystem :-
 a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem,
 d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)
 Degradation of the ecosystems and it's impacts.
- Unit 3. Natural Resources and Associated Problems :** **(8 lectures)**
 a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people.
 b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
 c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources.
 d) Food resources: World food problem, changes caused by agriculture ,effect of modern agriculture, fertilizer-pesticide problems.
 e) Energy resources: Growing energy needs, renewable and non- renewable energy resources, use of alternate energy sources. Solar energy , Biomass energy, Nuclear energy,
 f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Consumerism ,ecological foot prints, carbon foot prints, carbon credits.
 Role of an individuals in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

Unit 4. Biodiversity and its conservation : (8 lectures)

Introduction- Definition: genetic, species and ecosystem diversity.
 Bio-geographical classification of India.
 Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
 India as a mega- diversity nation.
 Western Ghat as a biodiversity region. Hot-spots of biodiversity.
 Threats to biodiversity: habitat loss, poaching of wildlife, man- wildlife conflicts,
 Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Convention on Biological Diversity.

Unit 5. Environmental Pollution : (8 lectures)

Definition: Causes, effects and control measures of: Air pollution,
 Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution,
 Nuclear hazards.
 Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.
 Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Solid waste management control rules.
 Role of an individual in prevention of pollution.

Unit 6. Social Issues and the Environment : (9 lectures)

Human population growth, impact on environment. Human Health and welfare.
 Environmental ethics: Role of Indian religious traditions and culture in conservation of the environment.
 Environmental movements- Chipko Movement, Appiko Movement, Silent Valley.
 Resettlement and rehabilitation of people; its problems and concerns.
 Water conservation, rain water harvesting, watershed management. water conservation by Dr.Rajendra Singh, Anna Hazare etc.
 Disaster management: floods, earthquake, cyclone, tsunami and landslides.
 Wasteland reclamation.
 Environmental communication and public awareness, case studies.

Unit 7. Environmental Protection- Policies and practises : (5 lectures)

Environmental Protection Act.
 Air (Prevention and Control of Pollution) Act.
 Water (Prevention and control of Pollution) Act
 Wildlife Protection Act
 Forest Conservation Act
 National and International conventions and agreements on environment.

Unit 8. Field Work :**(10 lectures)**

Visit to a local area to document environmental assets-

River/forest/grassland/hill/mountain.

or

Visit to a local polluted site – Urban/Rural/Industrial/Agricultural

or

Study of common plants, insects, birds.

or

Study of simple ecosystems - ponds, river, hill slopes, etc.

(Field work is equal to 10 lecture hours)

References :

- 1) Agarwal, K.C.2001, Environmental Biology, Nidi Pubi. Ltd., Bikaner.
- 2) Bharucha Erach, The Biodiversity of India, Mapin Publishing pvt. Ltd.,Ahmedabad 380013, India, Email:mapin@icenet.net (R)
- 3) Brunner R.C.,1989, Hazardous Waste Incineration, McGraw Hill Inc., 480p
- 4) Clank R.S. Marine Pollution, Clanderson Press Oxford (TB)
- 5) Cunningham, W.P. Cooper, T.H.Gorhani, E. & Hepworth, M.T.2001,
- 6) Environmental Encyclopedia, Jaico Publ. Hpise, Mumbai, 1196p
- 7) De A.K., Environmental Chemistry, Wiley Wastern Ltd.
- 8) Down to Earth , Cebtre fir Scuebce and Environment (R)
- 9) Gleick, H.,1993, Water in crisis, Pacific Institute for studies in Dev.,Environment & Security. Stockholm Env. Institute. Oxford Univ. Press 473p
- 10) Hawkins R.e., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
- 11) Heywood, V.H.& Watson, R.T.1995, Global Biodiversity Assessment,Cambridge Univ. Press 1140p.
- 12) Jadhav, H.& Bhosale, V.M.1995, Environmental Protection and Laws, Himalaya Pub. Hcuse, Delhi 284p.
- 13) Mickinney, M.L.& School. R.M.1196, Environmental Science Systems & Solutions, Web enhanced edition, 639p.
- 14) Mhaskar A.K., Mastter Hazardous, Techno-Science Publications (TB)
- 15) Miller T.G.Jr., Environmental Science. Wadsworth Publications Co. (TB)
- 16) Odum, E.P.1971, Fundamentals of Ecology, W.B.Saunders Co. USA, 574p.
- 17) Rao M.N.& Datta, A.K.1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd., 345p
- 18) Sharma B.K., 2001, Environmental Chemistry, Gokel Publ. Hkouse, Meerut
- 19) Survey of the Environment, The Hindu (M)
- 20) Townsend C., Harper, J. and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
- 21) Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, vol. I anfd II, Environmental Media (R)
- 22) Trivedi R.K. and P.K. Gokel, Intriduction to air pollution, Tecgbi-Science Publications (TB)
- 23) Wagner K.D.,1998, Environmental management, W.B. Saunders Co.Philadelphia, USA 499p.
- 24) Paryavaran shastra – Gholap T.N.
- 25) Paryavaran Sahastra – Gharapure
M) Magazine (R) Reference (TB) Textbook

“Dissemination of Education for Knowledge, Science and Culture”

- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur
(Autonomous)**



DEPARTMENT OF STATISTICS

B. C. A.III

Semester V & VI

SYLLABUS

Under Choice Based Credit System

To be implemented from Academic Year 2020 - 21

CHOICE BASED CREDIT SYSTEM
B.C.A. - III (Sem -V and VI)
Course Structure to be
implemented from 2021-22

Sr. No.		Course Name	Course Code	Credits	CA	CIE	Marks
Semester V							
1	CGPA	Cost Accounting	BCA-1419E	4	80	20	100
2		E-Commerce	BCA-1420E	4	80	20	100
3		Computer Network	BCA-1421E	4	80	20	100
4		RDBMS with Oracle	BCA-1422E	4	80	20	100
5		Visual Programming	BCA-1423E	4	80	20	100
6		RDBMS with Oracle and Visual Programming Practical	BCA-1424E	2	50		50
7		Mini Project	BCA-1425E	2	50		50
8		Python-I	SEC-BCA-E	2			
Semester VI							
9	CGPA	Strategic Management	BCA-1426F	4	80	20	100
10		Data Mining and Data Warehousing	BCA-1427F	4	80	20	100
11		Linux Operating System	BCA-1428F	4	80	20	100
12		Java Programming	BCA-1429F	4	80	20	100
13		Linux Operating System Practical	BCA-1430F	2	50		50
14		Java Programming Practical	BCA-1431F	2	50		50
15		Major Project	BCA-1432F	4	80	20	100
16		Python-II	SEC-BCA-F	2	100		100
Total				52			1300

B.C.A. Part - III
Part- III Semester - V
Cost Accounting (BCA 1419E)

Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO1: To inculcate knowledge on cost sheet, material issues and labor cost.

CO2: To provide adequate knowledge of cost accounting practice.

CO3: To interpret cost accounting statements.

CO4: To enhance knowledge of cost accounting principles and method.

Unit	Contents	Hours Allocated
1	Introduction to cost Accounting: Concept of cost, costing, Cost Accounting and Cost Accountancy, Objectives, Advantages and Limitations of Cost Accounting, Difference between cost Accounting & Financial Accounting, Cost Unit and cost centre. Elements of Cost, Preparation of cost sheet.	15
2	Cost Accounting of Material, Labour and Overheads : Methods of pricing of material issues FIFO, LIFO, Simple Average, weighted Average. Methods of Wages- Time basis, Piece Basis, Labour Turn over(Theory) Classification, Allocation, Absorption and Apportionment of Overheads (Theory)	15
3	Methods of Costing - Process: Costing excluding calculation of Equivalent production, contract costing, service costing (Transport Costing).	15
4	Reconciliation of Cost and Financial Accounts: Reconciliation of Cost and Financial Accounts.	15

References:

1. JawaharLal, Cost Accounting - Tata-McGraw Hill Publishing Co, New Delhi.
2. B.M. Lall Nigam and I.C.Jain, Cost Accounting, Principles, Methods and Techniques, K.L. Malik &sons Pvt. Ltd., Daryaganj, New Delhi.
3. M.C. Shukla, T.S. Grewal and M.P.Gupta, Cost Accounting, Text and problems, S. Chand and Co. Ltd.New Delhi.
- 4.S.P. Jain and K.L. Narang, Cost Accounting, Principles and Methods, Kalyani Publishers,Jalandhar.
5. S.N. Maheshwari& S.N. Mittal, Cost Accounting, Theory and Problems. ShreMahabir Book Depot,New Delhi.

B.C.A. Part - III
Part- III Semester - V
E-Commerce (BCA 1420E)

Theory: 60 Teaching Hours Credits - 4

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO1: To understand the basic concepts and technologies used in the field of management information systems.

CO2: To understanding on how internet can help business grow.

CO3: To understanding on the importance of security, privacy, and ethical issues as they relate to E-Commerce.

CO4: To understanding on how innovative use of the E-Commerce can help developing competitive advantage.

Unit	Contents	Hours Allocated
1	Introduction to E-Commerce: Defining Commerce; Main Activities of Electronic Commerce; Benefits of E-Commerce; Broad Goals of Electronic Commerce; Main Components of E-Commerce; Functions of Electronic Commerce – Communication, Process Management, Service Management, Transaction Capabilities; Limitations, Challenges and opportunities, Process of E-Commerce; Types of E-Commerce; Role of Internet and Web in E-Commerce; Technologies Used; E-Commerce Systems; Pre-requisites of E-Commerce; Scope of E-Commerce; E-Business Models. EDI- Concept, Components, working mechanism of EDI, Advantages and disadvantages of EDI. Difference between E-Business and E-Commerce, Introduction to M-Commerce	15
2	Electronic payment System Concept of e-payment, Difference between traditional and electronics payment system, UPI, NCPI, Digital cash, Credit and Debit card system, Smart Card, E Wallet, Prepaid, post-paid and instant payment system, Electronic funds transfer, Concept of e-banking	15
3	E-Security Concept of E-security, Security threats- concept and types, Malicious code, Phishing and identity theft, Hacking and cyber vandalism, Credit card fraud/Theft, Spoofing, Denial of service (DoS), Firewall and proxy server.	15
4	Security Solutions Concept of encryption and decryption, Symmetric and asymmetric key encryption, Cipher text, Digital Envelopes, Digital certificates, Security socket layer (SSL), Limitations of encryption solutions.	15

References:

1. E-Commerce- Kenneth C.Laudon and Carol GuercioTraver
2. Internet marketing and E-commerce-Ward Hanson and KirthiKalyanam
3. E-Commerce Concepts , Models , Strategies by -- G.S.VMurthy
4. E-Commerce by --Kamlesh K Bajaj and DebjaniNag
5. Electronic Commerce by --Gary P.SchneiderE-Commerce A Managers Guide, RaviKalk

B.C.A. Part - III
Part- III Semester - V
Computer Network (BCA 1421E)

Theory: 60 Teaching Hours Credits - 4

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO1: Define, use and implement Computer Networks and the basic components of a Network system.

CO2: Know and Apply pieces of hardware and software to make networks more efficient, faster, more secure, easier to use,

CO3: Able to transmit several simultaneous messages, and able to interconnect with other networks.

CO4: Apply channel allocation, framing, error and flow control techniques.

Unit	Contents	Hours Allotted
1	1 Basics of Data communication 1.1. Data Communication concept 1.1.1 Components-sender, receiver, message, transmission media 1.1.2 Data Flow- simplex, half-duplex, or full-duplex 1.2 Networks 1.2.1 Definition, Advantages and disadvantages 1.2.2 Categories of Networks- LAN, WAN. MAN 1.2.3 Network Architecture-Client-Server and Peer to peer 1.3 Multiplexing and switching 1.3.1 Frequency-Division Multiplexing, Wavelength-Division Multiplexing, Time-Division Multiplexing 1.3.2 Circuit switching, Packet Switching, Message Switching	15
2	Transmission media and Reference Models 2.1 Transmission Media 2.1.1 Guided Media - Twisted-Pair Cable, Coaxial Cable, Fiber-Optic Cable 2.1.2 Unguided Media: Radio Waves, Microwaves, Infrared, satellite communication 2.2 Transmission Modes- Parallel and Serial -(Asynchronous, Synchronous) 2.3 Reference Models 2.3.1 OSI reference model 2.3.2 TCP/IP reference model 2.3.3 Comparison of OSI and TCP/IP reference model 2.4 Protocol Standards 2.5 IP address scheme and characteristics of IP address	15
3	Data link, Network and Transport layer 12 3.1 Data link Layer- 3.1.1 Design issues 3.1.2 Framing, error detection and correction 3.2 Network layer 3.2. 1 design issues of network layer 3.2.2 Routing algorithm (shortest path, Flooding, distance	15

	vector,) 3.2.3 Congestion control 3.3 Transport layer 3.3.1 Transport Layer Primitives: listen, connect, send, receive, disconnect 3.3.2 Protocols: TCP, UDP	
4	4 Session, Presentation and Application layer 12 4.1 Session layer: 4.1.1 Services: dialog management, synchronization, activity management, exception handling 4.1.2 Remote procedure calls 4.2 Presentation layer: 4.2.1 Services: Translation, compression, encryption 4.2.2 Cryptography: concept, symmetric key & asymmetric key cryptography 4.3 Application layer: 4.3.1 Function4.3.2 Domain name system (DNS),Hypertext Transfer Protocol (HTTP),Simple Mail Transfer Protocol (SMTP) ,Telnet, File Transfer Protocol (FTP)	15

References:

1. Behrouz A. Forouzan- Data Communications And Networking - (4th edition) McGraw-Hill
2. Tanenbaum A.S. "Computer Network", 3rd Edition, Prentice Hall of India
3. Stalling W, "Computer Communication Network".(4th edition). Prentice hall of India 1993
4. Computer Networking: A Top Down Approach Featuring in Internet by James F.I.Kurose & K. W. Ross

B.C.A. Part - III
Part- III Semester - V
RDBMS with Oracle (BCA 1422E)
Theory: 60 Teaching Hours Credits - 4

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO1: Enhance the knowledge and understanding of database analysis and design

CO2: Enhance programming skills and techniques using SQL and PL/SQL

CO3: Use the relational Model and how it is supported by SQL and PL/SQL

CO4: To solve database problems using SQL and PL/SQL by using Cursors and Triggers.

Unit	Contents	Hours Allotted
1	Relational Database Management System: 12 1.1 Concept of RDBMS, Difference between DBMS and RDBMS, Features of RDBMS. 1.2 Introduction of Oracle, Role and responsibilities of DBA. 1.3 RDBMS Terminology- Relation, Tuple, Cardinality, Attribute, Degree, Primary Key, Domain, Codd's Rules 1.4 Relational Model, Functional Dependencies, Normalization and its types.	15
2	INTRODUCTION TO SQL: 12 2.1 Features of SQL, Data types, 2.2 Classification of SQL Commands - DDL (create, alter, drop), DML (insert, update, delete), DCL (grant, revoke), TCL (rollback, commit). 2.3 SQL Integrity Constraints-(Primary key, Foreign key, unique key, not null, default, check) 2.4 Select statement with group by and order by clause 2.5 SQL Operators-arithmetic, relational, Logical, Like, Between, IN operator 2.6 SQL Functions- Arithmetic functions, Conversion Functions, Date function, Aggregate functions, String functions.	15
3	JOIN AND SUB QUERIES: 12 3.1 Join types - Inner Join, Outer Join, Cross Join and self-Join 3.2 Sub-queries, Multiple sub queries, nesting of sub queries, sub queries in DML commands. 3.3 Correlated queries, Indexes, Sequences. Views-Create View, Drop, View and its Advantages. , Denial of service (DoS), Firewall and proxy server.	15
4	INTRODUCTION TO PL/SQL: 12 4.1 Introduction to PL/SQL, Block Structure 4.2 Data types in PL-SQL 4.3 Control Structures-Branching statements, Iterative Control statements.	15

	4.4 Cursors -Concept, Types- Implicit, Explicit, Procedure to create explicit cursors, Cursor Attributes. 4.5 TRIGGERS: Concept and types.	
--	---	--

References:

- 1) SQL, PL/SQL: The Programming Language- Ivan Bayross- (BPB)
- 2) Structured Query Language- by Osborne
- 3) SQL by Scott Ullman.
- 4) SQL & PL/SQL Black Book for Oracle by Dr,P.S.Deshpande

B.C.A. Part - III
Part- III Semester - V
Visual Programming (BCA 1423E)
Theory: 60 Teaching Hours Credits - 4

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO 1: Design, create, build, and debug Visual Basic applications.

CO 2: Explore Visual Basic's Integrated Development Environment (IDE).

CO 3: Implement syntax rules in Visual Basic programs.

CO 4: Explain variables and data types used in program development.

Unit	Contents	Hours Allotted
1	Introduction 12 1.1 overview, Architecture, Features of .NET , 1.2 Meta data, CLR, Managed and unmanaged code 1.3 CTS, CLS, .NET base classes 1.4 Introduction to Visual Studio .NET IDE 1.5 Types of JIT compiler	15
2	Introduction To C# 12 2.1 Introduction to C#, Entry point method, command line arguments 2.2 Compiling and building projects, Compiling a C# program using command line utility, CSC.EXE, Different valid forms of main. 2.3 Global stack and heap memory, reference type and data type, casting implicit and explicit 2.4 Boxing and unboxing, pass by value and pass by reference and out parameters 2.5 Partial class, DLL, Difference between DLL and EXE	15
3	Introduction to Web Programming 12 3.1 Understanding role of WEB server and WEB browser, HTTP request and response structure. 3.2 Introduction to ASP, Types of path, FORM tag 3.3 Types of server controls 3.4 Validation controls-Base validator, compare validator, range validator, grouping control validator 3.5 Web forms life cycle 3.6 Event handling in WEB forms, response.redirect, server.response, cross page post back property of button 3.7 ASP.NET state management 3.8 WEB.config, globalization and localization, AppDomain	16
4	ADO .NET 12 4.1 Introduction to ADO.Net 4.2 ADO.NET Architecture- Connction, command, dat reader, data adapter,	15

	data set 4.3 Understanding connected layer of ADO.NET and disconnected layer of ADO.NET	
--	--	--

References:

1. Inside C# - By Tom Archer, Andrew Whitechapel (Microsoft Pub)
2. ASP.NET Black Book- By Steven Holzner
3. Professional ASP.NET 2 -Wrox Series- Wallace B. McClure

B.C.A. Part - III CBCS
Part- III Semester - V
Lab Course based on 1422E and 1423E (BCA 1424E)
Hours Credits - 2

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

- CO1: Translate an information model into a relational database schema and to implement the schema using RDBMS.
- CO2: Apply relational database theory to create database tables for SQL queries.
- CO3: Design, create, build, and debug Visual Basic applications.
- CO4: Explore Visual Basic's Integrated Development Environment (IDE).

Lab exercise based on paper1422E - RDBMS with Oracle

1. SQL queries on DDL statements.
2. SQL queries on DML statements.
3. SQL queries on Operators-relational, Logical, Like, Between, IN operator
4. SQL queries on Oracle Functions and clauses
5. SQL queries on Join
6. Creating Views and index
7. PL-SQL block on branching statement.
8. PL-SQL block on looping statement.
9. PL-SQL blocks to create explicit cursor.
10. PL-SQL blocks to study attributes of explicit cursor.
11. PL-SQL blocks to create Trigger.

B.C.A. Part - III
Part- III Semester - V
Mini Project (BCA 1425E)
Hours Credits - 2

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO1: Understand how to identify the issues and challenges of industry.

CO2: Prepare report on the application of emerging technologies in the selected industry.

CO3: Implement hardware and / or software techniques for identified problems.

CO4: Test and analyse the modules of planned project.

Mini Project

The group of students may undertake a software project in consultation with the internal guide. The group size should not exceed four students. The student is expected to do project in any language studied in 5th or earlier Semesters. The mini Project will be evaluated by the external examiners appointed by University.

B.C.A. Part - III
Part- III Semester - VI
Strategic Management (BCA 1426F)
Theory: 60 Teaching Hours Credits - 4

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO 1: To develop their capacity to think and execute strategically.

CO 2: To demonstrate a clear understanding of the concepts, tools and techniques used by executives in developing and executing strategies.

CO 3: To demonstrate the capability of making their own decisions in dynamic business landscape.

CO 4: To analyses and implement strategy at the single business unit level.

Unit	Contents	Hours Allotted
1	Introduction to Strategic Management Concept of Mission, Vision, Objectives, Concept of Strategy, Importance of Strategy, Levels of Strategy, Strategic Management Process - Different Phases.	15
2	Environment Analysis Concept and Characteristics of environment, components of internal environment, SWOC, Components of external environment, PESTEL Framework - Porter's Five Forces Model.	15
3	Strategies Types and Analysis Corporate strategies: stability strategy, expansion strategy, retrenchment strategy.-adv/disadv. Competitive strategy: cost leadership, Differentiation and Focus Strategy - Types - adv/disadv. BCG Matrix, TOWS Matrix, ANSOFF Matrix.	15
4	Strategic Evaluation and Control Strategic evaluation: imp, problems -Benchmarking for strategy evaluation. Strategic Control : Types and techniques of strategic control, - operational control-managing strategic change-types, mechanism and process of managing strategic change-strategy in global environment-Social & environmental sustainability issues in strategic management, Triple bottom line- Role of Different Strategists- Contemporary practices of strategic management.	15

Reference:

1. AzarKazmi - Business Policy - Tata McGraw Hill
2. R. M. Srivastava - Management Policy and Strategic Management - Himalaya Publishing House
3. R. Srinivasan - Strategic Management - Indian Context - Prentice Hall of India Pvt. Ltd.
4. Srinivasan, Strategic Management - Indian Context, Prentice Hall Of India
5. Fraed R. David - Strategic Management Concepts and Cases (Person)
6. P SubbaRao- Business Policy and Strategic Management (Himalaya)

B.C.A. Part - III
Part- III Semester - VI
Data Mining and Data Warehousing (BCA 1427F)
Theory: 60 Teaching Hours Credits - 4

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:
CO 1: To apply knowledge of mathematics, science, and engineering
CO 2: To design and conduct experiments, as well as to analyze and interpret data.
CO 3: To remove redundancy and incomplete data from the dataset using data preprocessing methods.
CO4: To understand warehousing architectures and tools for systematically organizing large database and use their data to make strategic decisions.

Module	Content	Hours Allotted
I	Introduction to Data Mining 12 1.1 Basic Data mining Task 1.2 DM versus Knowledge Discovery in Databases 1.3 Data Mining Issues 1.4 Data Mining Metrics 1.5 Social implementation of Data Mining 1.6 Overview of Application of Data mining 1.6.1 Architecture of DW 1.6.2 OLAP and Data Cubes 1.6.3 Dimensional Data Modeling - star , snowflake schemas 1.6.4 Data processing - Need Data cleaning. Data integration and Transformation, Data reduction 1.6.5 machine learning 1.6.6 pattern matching	18
II	Data Mining techniques 14 2.1 Frequent item - set and association rule mining: apriori algorithm, use of sampling for frequent item- set tree algorithm 2.2 graph sampling : frequent sub graph mining . tree mining ,sequence mining 2.3 Classification and prediction: 2.3.1 Decision tree [3 hrs] 2.3.2 Construction, performance, attribute selection 2.3.3 Issues : Over fitting tree pruning methods, missing values, continuous classes 2.3.4 Classification and regression tree(CART) 2.3.5 Bayesians Classification [6 hrs] 2.3.6 Bayesians theorem , Narvee Bayes classifier 2.3.7 Bayesian networks 2.3.8 Inference 2.3.9 Parameter and structure learning	16

	2.3.10 Linear classification [4 hrs] 2.3.11 Least squares, logistics, perception and SVM classifiers 2.3.12 Prediction [3 hrs] 2.3.13 Linear regression 2.3.14 Non-linear regression	
III	Clustering 12 3.1 K-means 3.2 expectation maximization (EM) algorithm 3.3 Hierarchical clustering, Carrolton clustering	14
IV	Software for Data mining and application of Data mining 10 4.1 R 4.2 Weka 4.3 Sample applications of data mining	12

References:

1. Data Mining : Concept and Techniques Han Elsevier ISBN : 978938031913
2. Margaret H. Dunham, S. Shridhar Data Mining- Introductory and advanced topics Pearson education
3. Tom Mitchell- machine learning McGraw hill 1997

B.C.A. Part - III
Part- III Semester - VI
Linux Operating System (BCA 1428F)
Theory: 60 Teaching Hours Credits - 4

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO 1: Get knowledge of Operating System functions

CO 2: Execute different commands in Linux

CO 3: Develop various shell script programs using VI editor.

CO4: Explain the structure and functions of operating systems along with their components, types and working.

Module	Content	Hours Allotted
I	Introduction 12 1.1 Operating system 1.2 Types of operating system 1.3 Functions of operating system 1.4 History and development of Linux 1.5 Features of Linux 1.6 Login , logout procedure, Concept of shell, kernel, Kernel-shell relationship	15
II	Handling files and directory's 12 2.1 Concept of file, types, file system tree 2.2 Different GPU (clear ,cal , date, wc, who) 2.3 file handling- ls ,cat ,cp, mv , rm commands , listing file names, using meta characters (* , ? , []). 2.4 Concept of directory , home directory , directory handling commands- cd , mkdir, rmdir,pwd. 2.5 Basic file attributes, change file/ directory, chmod command 2.6 Filters-cut, paste, sort, unique, head, tail, grep commands. 2.7 Command linking using pipe () operator, command substitution.	15
III	VI editor 12 3.1 Vi Editor, use of VI , features of VI 3.3 Different modes and working with VI editor 3.4 Command mode -cursor movements(k,j,h,l), delete(character, line, word), Screen up , down, use of repeat factor , joining lines (J), searching for	15

	pattern (/ and ?) 3.5 Input mode- switching with (I,o,r,s,a,I,O,R,S,A) 3.6 ex mode - saving (w, x, q)	
IV	Simple Shell programming 12 4.1 Concept of Shell Script, running a shell script 4.2 Statements – read , echo , test , if, case , exit. 4.3 Loops- while, until, for 4.4 Command line arguments 4.5 Exit status of a command	15

References:

1. Unix concept and applications ----- Sumitabha Das
2. Unix shell programming- YashwantKanetkar
3. Linux programming- Foreword By- Alan Cox
4. RedHalt Linux 718 By Bill Ball , David Pitts

B.C.A. Part - III
Part- III Semester - VI
Java Programming (BCA 1429F)
Theory: 60 Teaching Hours Credits - 4

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO 1: Understanding of the principles and practice of object oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements;

CO 2: Ability to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.

CO 3: Demonstrate the principles of object oriented programming.

.CO4: Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.

Module	Content	Hours Allotted
I	Introduction To Java 1.1 History and features of Java Programming 1.2 Difference between Java & C++ 1.3 Java Environment 1.4 Java tokens, constants, variables, data types, type casting 1.5 Operators and Expressions 1.6 Implementing Java Program 1.7 Branching and looping statements 1.8 Class, objects, methods 1.9 Constructors and destructor	15
II	Inheritance and Packages 2.1 Defining sub class, subclass constructor 2.2 Inheritance-Multiple and hierarchical 2.3 Defining packages, system packages 2.4 Creating & accessing packages 2.5 Adding a class to package 2.6 Polymorphism- function overloading and over ridding, its difference	15
III	Multithreading and Exception Handling 3.1 Creating threads, extending a thread class- declaring the class, run() method 3.2 Stopping and blocking threads 3.3 Life cycle of thread 3.4 Using thread method 3.5 Thread priority 3.6 Introduction to exception 3.7 Syntax of exception handling code 3.8 Multiple catch statement 3.9 Using finally statement 3.10 Throwing exception	15

IV	Applets Programming & Introduction to AWT 4.1 Introduction to applets 4.2 Building applet code 4.3 Applet life cycle 4.4 Adding applet code to HTML file 4.5 Introduction to Abstract Window Toolkit (AWT)	15
----	--	----

References:

1. Programming with JAVA, A Primer, 2nd Editions, E Balagurusamy
2. Java Programming- RajendraSalokhe (Aruta Pub)
3. Core Java an integrated approach – Dr R. Nageshwara

B.C.A. Part - III
Part- III Semester - VI
Lab Course based on 1428F (BCA 1430F)
Hours Credits - 2

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO 1: The course objectives ensure the development of students applied skills in operating systems related areas.

CO 2: Students will gain knowledge in writing software routines modules or implementing various concepts of operating system

CO 3: Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.

CO4: Able to implement C programs using Unix system calls.

Practicals-

1. Login , logout procedure (user/ login name and password)
2. Copy, move, delete files form different directories.
3. Change file access permissions using chmod and confirm using ls -l command
4. Use of filter commands
5. Creating text files using VI editor.

Shell scripts-

1. Shell script to get any number and display its square , cube sum of its digits
2. Use of command line arguments in a script.
3. Script using if statement.
4. Script handling use of case structure.
5. Scripts with command substitution such as to count number of files, number of users working on Linux network etc,

B.C.A. Part - III
Part- III Semester - VI
Lab Course based on 1429F (BCA 1431F)
Hours Credits - 2

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO 1: To introduce students to the java programming language.

CO2: To create java programs that leverage the object oriented features of java language such as encapsulation, inheritance and polymorphism.

CO3: Use data types, arrays and other data collections.

CO4: To implement I/O functionality to read from and write to text files.

Sample programs

1. Java programs based on command line arguments
2. Java programs based Type Casting
3. Java programs based on branching and looping statements
4. Java programs based on constructors
5. Java programs based on method overloading
6. Java programs based on interfaces
7. Java programs based on inheritance
8. Java programs based on packages
9. Java programs based on multithreading
10. Java programs based on exception handling
11. Java programs with applets.

B.C.A. Part - III
Part- III Semester - VI
Major Project (BCA 1432F)
Hours Credits - 2

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO1: Students should be able to design and construct a hardware and software system, components or process to meet desired needs.

CO2: Students are provided to work on multidisciplinary problems.

CO3: Students should be able to work as professionals, with portfolio ranging from data management, network configuration, designing hardware, database and software design to management and administration of entire system.

CO4: Identify, analyze, and solve problems creatively through sustained critical investigation.

A group of maximum four students prepare a major project under the guidance of internal teacher. Project report will be evaluated by the internal teacher out of 20 marks and there will be viva-voce examination for 80 marks. (Documentation - 20 Marks, Online Presentation-- 30 Marks, Viva-Voce -- 30 Marks.)

The panel for viva-voce examination will be appointed by university. The student should prepare the project report on the work carried out as a project in semester VI.

Guidelines for Project:

Number of Copies: The student should submit two Hard-bound copies of the Project Report. Acceptance/Rejection of Project Report:

The student must submit an outline of the project report to the college for approval.

The college holds the right to accept the project or suggest modifications for resubmission. Only on acceptance of draft project report, the student should make the final copies.

Format of the Project Report:

The student must adhere strictly to the following format for the submission of the Project Report.

a. Paper:

The Report shall be typed on white paper, A4 size, for the final submission. The Report to be submitted to the must be original and subsequent copies may be photocopied on any paper.

b. Typing:

The typing shall be of standard letter size, 1.5 spaced and on one side of the paper only. (Normal text should have Arial Font size 11 or 12. Headings can have bigger size)

c. Margins:

The typing must be done in the following margins:

Left -----1.5 inch, Right ----- 1 inch

Top ----- 1 inch, Bottom ----- 1 inch

d. Front Cover:

The front cover should contain the following details:

TOP : The title in block capitals of 6mm to 15mm letters.

CENTRE: Full name in block capitals of 6mm to 10mm letters.

BOTTOM: Name of the University, Course, Year of submission -all in block capitals of 6mm to 10mm letters on separate lines with proper spacing and centering.

f. Blank Sheets:

At the beginning and end of the report, two white blank bound papers should be provided, one for the purpose of binding and other to be left blank.

Documentation Format

- a) Cover Page
- b) Institute/College Recommendation
- c) Guide Certificate
- d) Declaration
- e) Acknowledgement
- f) Index
- g) Chapter Scheme
 - 1) Introduction to Project
 - Introduction
 - Existing System
 - Need and scope of Computer System
 - Organization Profile
 - 2) Proposed System
 - Objectives
 - Requirement Engg.
 - Requirement Gathering
 - SRS
 - 3) System Analysis
 - System Diagram
 - DFD
 - ERD
 - UML(if applicable)
 - 4) System Design
 - Database Design
 - Input Design
 - Output Design
 - 5) Implementation
 - System Requirement
 - Hardware
 - Software
 - Installation process
 - User Guideline
 - 6) Output(with valid Data)
(Minimum 6 reports)
 - 7) Conclusion and Suggestions
 - Conclusion

- Limitations
- Suggestion

8) References:-

- Books:-
- Journals:-
- Periodicals and Newspapers:-
- Web
- Questioner/Schedule(if used)
- Source code(Include Main Logic source code)

Evaluation Pattern

Sr. No.	Type	Particular	Marks	Total
1	Internal	Assignment	06	20
		Seminar	08	
		Oral	06	
2	External	Theory paper	80	80
Total				100

Nature of Question Paper (Theory)

B.C.A. III

Marks 80

Instructions:-

- All Questions carry equal marks.
- Attempt any five Questions out of seven.
- Question No. 8 is Compulsory

Q.1	Long Answer	16Marks
Q.2	Long Answer	16Marks
Q.3	Long Answer	16Marks
Q.4	Long Answer	16Marks
Q.5	Long Answer	16Marks
Q.6	Long Answer	16Marks
Q.7	Long Answer	16Marks
Q.8	Write Short Notes (Attempt any four out of Six)	16Marks

Note: Question of 16 Marks can be distributed in 8 + 8 marks sub questions.

“Dissemination of Education for Knowledge, Science and Culture”

Shikshan Maharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)**



DEPARTMENT OF B. B. A

B.B.A. Part - III

Semester-V & VI

SYLLABUS

Under Choice Based Credit System

To be implemented from Academic Year 2020-21

B.B.A. Part I Sem-V
CBCS Syllabus with effect from 2020

CC-1377E - Financial Management Paper I (Credit-4)

Course Outcome : At the end of this course students will able to.....

CO 1 : Understand the concepts in Financial Management

CO 2 : Prepare statement of Working Capital

CO 3 : Demonstrate calculations of Leverage.

CO 4 : Understand the concepts Capitalization..

Module	Content	Teaching hours
I	Nature of Financial Management: Meaning and Significance, Nature: Finance and related disciplines, Scope: Traditional and Modern approaches, Objectives: Profit maximization versus wealth maximization, Functions of Financial Management: Recurring and non - recurring.	15
II	Financial Planning: Meaning, Objectives, Characteristics, Steps, And Types of financial plans, Capitalization: Concept, Theories of capitalization, Over - capitalization and under - capitalization.	15
III	Management of Working Capital : Meaning and Concept, Importance of adequate working capital, Types of working capital, Determinants of working capital, Computation of working capital (Practical Problems) Operating and Financial Leverage : Meaning, Concept, EBIT &EPS ,Measurement of leverages,	15
IV	Mutual Funds: Concept, importance, Types of Mutual Funds open ended and close ended-Money Market Funds, Income Funds, Bond Funds, Balanced Funds, Equity Funds, International Funds, Specialty Funds, Index Funds, Exchange-Traded Funds Present position of Mutual Funds in India.	15

Reference Books :

1. Financial Management : Prasanna Chandra
2. Financial Management : Text and Problems : M. Y. Khan and P. K. Jain
3. Financial Management : I. M. Pandey
4. Taxman's Financial Management : Ravi M. Kishore
5. Financial Management : Principles and Practice : S. N. Maheshwari

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020

CC-1377F - Financial Management Paper I (Credit-4)

Course Outcome : At the end of this course students will able to.....

CO1 : Understand the concepts in Cost of Capital.

CO2 : Understand the Techniques of evaluation of capital budgeting proposals

CO3 : Demonstrate calculations of Cost of Capital

CO4 : Understand the concepts Corporate Restructuring

Module	Content	Teaching hours
I	Capital Structure: Meaning , Factors to be considered while framing capital structure, capital structure theories: Net income approach, net operating income approach, Traditional theory, Modigliani and Miller approach.	15
II	Cost Of Capital: Meaning, Importance, Measurement of cost of capital (i) specific cost: Cost of debt, Cost of equity shares, Cost of preference shares; (ii) Overall cost: Weighted averages cost of capital. (Practical Problems)	15
III	Capital Budgeting Decision : Meaning, Importance, Techniques of evaluation of capital budgeting proposals - Payback period, Accounting rate of return, Net present value, Internal rate of return, Profitability index (practical problems)	15
IV	Corporate Restructuring Merger & acquisition- motives & benefits ,merger negotiations ,significance of P/E Ratio & EPS Analysis	15

Reference Books :

1. Financial Management : Prasanna Chandra
2. Financial Management : Text and Problems : M. Y. Khan and P. K. Jain
3. Financial Management : I. M. Pandey
4. Taxman's Financial Management : Ravi M. Kishore
5. Financial Management : Principles and Practice : S. N. Maheshwari

B.B.A. Part I Sem-V
CBCS Syllabus with effect from 2020

CC-1376E - Recent Trends in Marketing – I (Credit-4)

Course Outcome : At the end of this course students will able to.....

CO1: To understand importance of marketing information.

CO2: To describe marketing communication and future medium of Communications

CO3: To find out reasons of customer dissatisfaction and delight

CO4: To distinguish between rural marketing and agro marketing

MODULE	CONTENT	Teaching Hours
I	Marketing Information System - Meaning and Characteristics, Elements or Components of MIS, Need for MIS, Benefits of MIS.	15
II	Marketing Communication and Direct Marketing - Meaning and Concept of Marketing Communication, Process of Integrated Marketing Communication, Factors determining - Marketing Communication Mix, Future Medium of Communication - WEBS & INTERNET. Direct Marketing - Meaning, Forms of Direct Marketing	15
III	Customer Relationship Management (CRM) - Meaning, Changing, Nature of Customer relationship, Customer relation, Customer dissatisfaction and delight, e-CRM, Customer strategy for building customer relationship.	15
IV	Rural Marketing - Meaning, Definition, Concept, Characteristics of Rural Market, Reasons for growth of Rural Market, Segmenting & Targeting Rural Markets, Problems in Rural Marketing. Agro Marketing – Objectives and challenges in agricultural marketing.	15

Reference Books :

1. Principles of Marketing - Philip Kotler Gavy Armstrong - Pearson-Prentice Hall Ltd., D e l h i .
2. Marketing Management (Text & cases in Indian context) - Dr. Karunakaran - Himalaya Publishing House, Mumbai
3. Rural Marketing - Pradeep Kashap - Pearson-Prentice Hall Ltd., Delhi.
4. Rural Marketing - CSG Krishna - Marharyulud, Lalita Rama - Krishanan - Pearson

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020

CC-1376F - Recent Trends in Marketing – II (Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: To understand the concepts of online and digital marketing

CO2: To elaborate about retailing

CO3: To understand need have study of global marketing

CO4: To understand emerging payment modes

MODULE	TITLE	Teaching Hours
I	Online Marketing - Meaning and Concepts, Merits of online marketing, Demerits of online marketing, Online Marketing Domains, Setting up an online marketing Presence. Digital Marketing- Mobile marketing	15
II	Retail Marketing - Meaning and Functions of retailing, Characteristics of retailing, types of retailing, Retail marketing strategy, Retail Management Activities, Retail Organization Structure, Retailing Scene in India.	15
III	Global Marketing / International Marketing - Meaning, Definition, Objectives / reasons for global marketing, difference between domestic and global marketing, global marketing environment, Marketing -mix strategy for global marketing (i.e. Product, Price, Promotion, Distribution, Strategies.)	15
IV	Emerging payment modes- QR, online And other-advantages and disadvantages News In Marketing - Holistic Marketing, Emotional Marketing experiential marketing, Event Marketing, Consumerism, Marketing Ethics.	15

B.B.A. Part I Sem-V
CBCS Syllabus with effect from 2020

CC-1381- Research Methodology – II (Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: To understand the basic idea of research

CO2: To choose proper sample design

CO3: To analyze data

CO4: To write research report

Module	Title	Teaching Hours
I	Introduction to Research Methodology - Meaning, definition, objective and types of research, significance of research, selection of research problem. Research Design: Meaning, steps in research design, characteristics of good research design.	15
II	Sampling Design and Data Collection - Meaning of sampling, characteristics of good sample design, Types of sample design. Data collection-Meaning, types, of data, methods of collecting primary data- observation, interview questionnaire and schedules, Sources of secondary data.	15
III	Processing and Analysis of data - Classification of data, types of classification, Tabulation, parts of table, types of tables, Graphical presentation of data- Bar – diagram, pie-chart and curves. Analysis and Interpretation of data-meaning, methods of data analysis, techniques of interpretation. Practical- preparing questionnaire, collection of data, use of MS-excel and introduction to SPSS	15
IV	Report Writing Meaning, significance, steps in writing report, logout of the research report, Types of report, mechanics of writing a research report, Precautions for writing research report, Uses of computer in research. Practical- writing a research paper	15

Reference Books :

1. Principles of Marketing - Philip Kotler Gavy Armstrong - Pearson-Prentice Hall Ltd., Delhi.
2. Marketing Management (Text & cases in Indian context) - Dr. Karunakaran - Himalaya Publishing House, Mumbai
3. Rural Marketing - Pradeep Kashap - Pearson-Prentice Hall Ltd., Delhi.
4. Rural Marketing - CSG Krishna - Marharyulud, Lalita Rama - Krishanan - Pearson

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020

CC-1378E- Fundamentals of Business Laws and Tax Laws Paper I
(Credit-4)

Course Outcome: At the end of this course students will able to.....

C01: To understand the Philosophy of Law

C02: To understand Sale of goods

C03: To analyze Tax Laws

C04: To describe Classification of Taxes

Module	Syllabus	Teaching Hours
I	Introduction to Business Law - Meaning and Philosophy of Law - Object of Law - Classification of Law - Justice Delivery System in India - Classification of Courts in India - Meaning and Sources - Business Law.	15
II	The Indian Contract Act 1872 - Definition of Contract - Essentials of Valid Contract - Consideration - Free Consent - Void Contracts - Performance of Contract - Termination and Discharge of Contract - Breach of contract and remedies for breach of contact	15
III	Sale of Goods Act 1930 - Definition of Contract of Sale of goods - Agreement to sell - Essentials of Contract of Sale - Condition and Warranty - Transfer of Property - Transfer of Title - Performance of Contract of Sale - Unpaid Seller and his rights.	15
IV	Tax Laws - Sources of Government revenue - Meaning of Tax - Objectives of Taxes - Classification of Taxes - Tax Laws applicable to Business. (10 Periods)	15

Reference Books:

1. Elements of Mercantile Law - By N. D. Kapoor - Sultanchand & Sons
2. Indian Contract Act - By Avtar Singh - Eastern Book Company
3. Business Law for Managers - Prof. (cmde) P. K. Goel, Biztantra
4. Business Law - By M. C. Kuchal Vikas Publication

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020

GEC-1378F- Fundamentals of Business Laws and Tax Law- II

(Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: To understand the Tax Laws

CO2: To understand Negotiable Instrument Act

CO3: To describe Intellectual Property Rights

CO4: To study Consumer Protection Act

Module	Syllabus	Teaching Hours
I	Indian Companies Act 1956 - Definition and Characteristics of Company - Classification of Company - Procedure of Incorporation - Memorandum of Association - Articles of Association - Prospectus - Share Capital - Management of Companies - Qualifications - Appointments - Removal of directors - Company Meetings - Winding up of a Company.	15
II	Negotiable Instrument Act 1881 - Definition - Features of Negotiable Instruments - Types of Negotiable Instruments - Holder and Holder in due Course- Negotiation - Assignment - Endorsement of Negotiable Instrument Crossing of Cheque - its Kind - Dishonour and Discharge of Negotiable Instruments.	15
III	The Consumer Protection Act 1986 - Definitions - Consumer - Service - Complaint - Complainant - Fair and Unfair Trade - Practices - Consumer dispute - Consumers dispute redressal agencies.	15
IV	Intellectual Property Rights and Right to Information Act - Intellectual Property Rights - Trade Marks - Patents - Copy Rights - Industrial Design (Only Concepts) Right to Information Act -Nature and Scope - Right to Information Act	15

Reference Books:

1. Elements of Mercantile Law - By N. D. Kapoor - Sultanchand & Sons
2. Indian Contract Act - By Avtar Singh - Eastern Book Company
3. Business Law for Managers - Prof. (cmde) P. K. Goel, Biztantra
4. Business Law - By M. C. Kuchal Vikas Publication

B.B.A. Part I Sem-V
CBCS Syllabus with effect from 2020

GEC-1375E- Practices in Modern Management (Credit-4)

Course Outcome: At the end of this course students will able to.....

C01: To knowledge about various modern management thoughts.

C02: To understand the application of management techniques to solve various Management problems.

C03: To Interpret concept of internal and external organizational environment.

C04: To Understand the concept of Future manager and its challenges.

Module	Content	Teaching Hours
I	Development of Management Thought: Different Approaches to Management- Classical, Functional, Behavioral, Human relation, Contingency and System Approach. Management by Objectives	15
II	Contribution of Michel Porter: Competitive Advantage- Cost leadership, differentiation – and Focus. Contribution of C.k.Pralhad- Core competency	15
III	Organizational Environment: Internal and External Environment, Environment Analysis- SWOT Analysis, Applicability of SWOT to individual and organization Corporate Governance-concept and importance	15
IV	Management in future: management: Challenges and tasks, skills needed by manager in future, changes in managerial functions and evolving new managerial systems.	15

Reference Books:

1. Management: Concept and Strategies by J. S. Chandan, Vikas Publishing
2. Business Environment and Policy – A book on Strategic Management/Corporate Planning By Francis Cherunilam Himalaya Publishing House 2001Edition
3. Principles & practice of management - Dr. L.M.Parasad, Sultan Chand & Sons - New Delhi
4. Business Environment and Policy – A book on Strategic Management/Corporate Planning By Francis Cherunilam Himalaya Publishing House 2001Edition
5. Principles & practice of management - Dr. L.M.Parasad, Sultan Chand & Sons - New Delhi
6. Principles and Practices of management by shejwalkar Essential of management by Koontz H and Weitrich
7. Principles and practices of Management by T. N.Chabra Management theory and practice,
8. Dr.C.B.Gupta Sultan Chand and sons Publication New Delhi

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020
GEC-1375F- Practices in Modern Management (Credit-4)

Course Outcome: At the end of this course students will able to.....

C01: To Get knowledge about Social responsibility and Ethical Issues.

C02: To Describe the concept of Time and event management.

C03: To Interpret concept Stress and Disaster management.

C04: To Understand the concept of Strategic management.

Module	Title of the Topic	Lectures
I	Social Responsibilities and Business Ethics: Concept of Social Responsibility – Areas of Social Responsibility. Concept of Ethics, Ethical issues in business.	15
II	Time and Event Management: Meaning, Importance and Techniques of Time Management, Concept and Importance of Event Management, Types of Events. (Case Study)	15
III	Stress and Disaster Management: Definition, causes, types of Stress, Management of stress. Meaning of Disaster, Types of Disaster and managing Disaster. (Case Study)	15
IV	Strategic Management: Introduction, Definition, Meaning Nature, Scope and Importance of Strategic Management, Levels of Strategies, Process of strategic management, Different phases of strategic management	15

Reference Books:

- 1) Management: Concept and Strategies by J. S. Chandan, Vikas Publishing
- 2) Business Environment and Policy – A book on Strategic Management/Corporate Planning By Francis Cherunilam Himalaya Publishing House 2001Edition
- 3) Principles & practice of management - Dr. L.M.Parasad, Sultan Chand & Sons - New Delhi
- 4) Business Environment and Policy – A book on Strategic Management/Corporate Planning By Francis Cherunilam Himalaya Publishing House 2001Edition
- 5) Principles & practice of management - Dr. L.M.Parasad, Sultan Chand & Sons - New Delhi
- 6) Principles and Practices of management byshejwalkar Essential of management by Koontz H and Weitrich Principles and practices of Management by T. N.Chabra Management theory and practice,
- 7) Dr.C.B.Gupta Sultan Chand and sons Publication New Delhi

B.B.A. Part I Sem-V
CBCS Syllabus with effect from 2020

GEC-1379E- Foundation of Human Skills (Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: To develops different human skills among

CO2: To enhance quality behavior.

CO3: To increase Emotional Quotient by learning values.

CO4: To Understand communication skills and personal ability.

Module	New syllabus	Teaching Hours
I	<p>Basics Of Human Skills Introduction to Human skills, Types of human skills – Reading, Writing, Listening, Speaking. Basic abilities – Muscular, sensor, mental, social and conceptual. Use of basic abilities in organizational life.</p>	15
II	<p>Understanding Self And Others Understanding self and others through Johari Window. Journey of self discovery. Analysis of strength and weakness. Goal settings to overcome weakness. Learning – Concepts, Principles of learning, learning through reinforcement, learning through feedback's, learning by observations, learning through experience.</p>	15
III	<p>Human Attitudes And Values Attitudes – concept, components of attitudes. The attitude formation process. Values- Importance of values, sources of values, five universal values (Truth, Righteous conducts, Peace, Love, Non-violence) & sub values.</p>	15
IV	<p>Communication Meaning- Four functions of communication-control, Motivation, Emotional expression, Information, Characteristics of communication. Written communication- preparation of Resume. Oral communication- Facing an Interview.</p>	15

Reference Books:

1. Basic Managerial Skills For All- E.H. McGrath (Prentice Hall of India Ltd.)
2. Human Values For Managers- Chakraborty
3. Organizational Behavior Through - M.N. Mishra (Himalaya Publishing House)
4. Indian Philosophy- S.D. Bagade (Himalaya Publishing House)
5. Total Quality Management - Luthans Fred
6. Organizational Behavior- Tilak Raj Bhardwaj (A Mittal Publication)
7. Education to Human Values - Edwin Flippo

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020

GEC-1379E- Foundation of Human Skills (Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: Describe new skills in management.

CO2: Elaborate the concept of personality and different Theory of personality.

CO3: Understand skill development method and interpersonal skill.

CO4: Understand the concept of career management.

Module	New syllabus	Teaching Hours
I	<p>New Skills In Management Creative style – Emotional Intelligence (E.Q.) – Leadership skills, work style- sales competencies, sports mental skills, conflict management, stress management, Team role skills critical thinking skills, computing skills.</p>	15
II	<p>Personality Meaning- Aspects of personality, Development of personality: Erickson's eight life stages, Jung's Personality Theory, Traits in influencing organizational behavior. Locus of control. Problem solving styles.</p>	15
III	<p>Skills Development Decision making skills, Methods used to develop decision making skills- In the basket, Business games, case studies. Interpersonal skills- Meaning, Methods Used to develop interpersonal skills-role playing, Behavior modeling, sensitivity Training, Transactions Analysis – structural Insight.</p>	15
IV	<p>Utilizations of skills Career Management – Career stages model, basic career – Anchors – Security, Autonomy, creativity, Functional competence, Managerial Competence, factors affecting career choices, career opportunities in management.</p>	15

Reference Books:

1. Basic Managerial Skills For All- E.H. McGrath (Prentice Hall of India Ltd.)
2. Human Values For Managers- Chakraborty
3. Organizational Behavior Through - M.N. Mishra (Himalaya Publishing House)
4. Indian Philosophy- S.D. Bagade (Himalaya Publishing House)
5. Total Quality Management - Luthans Fred
6. Organizational Behavior- Tilak Raj Bhardwaj (A Mittal Publication)
7. Education to Human Values - Edwin Flipp

Nature of Question Paper

Duration: 2Hours-

Total Marks – 40

Instructions:- 1) All Questions are compulsory

2) Figures to the right indicate full marks.

	Nature of Questions	Marks
Q.1	Broad Question	14
	OR	
	Broad Question	
Q.2	Write Short Answers(Any Two)	16
	a)	
	b)	
	c)	
	d)	
Q.3	Write Short Notes(Any Two)	10
	a)	
	b)	
	c)	
	d)	

INTERNAL MARKS

BBA- III

FOR ALL SUBJECTS

INTERNAL MARKS

10 marks

Home assignments

05 marks

Seminars

05 marks

B.B.A. Part I Sem-V
CBCS Syllabus with effect from 2020

CC-1377E - Financial Management Paper I (Credit-4)

Course Outcome : At the end of this course students will able to.....

- CO 1 :** Understand the concepts in Financial Management
CO 2 : Prepare statement of Working Capital
CO 3 : Demonstrate calculations of Leverage.
CO 4 : Understand the concepts Capitalization..

Module	Content	Teaching hours
I	Nature of Financial Management: Meaning and Significance, Nature: Finance and related disciplines, Scope: Traditional and Modern approaches, Objectives: Profit maximization versus wealth maximization, Functions of Financial Management: Recurring and non - recurring.	15
II	Financial Planning: Meaning, Objectives, Characteristics, Steps, And Types of financial plans, Capitalization: Concept, Theories of capitalization, Over - capitalization and under - capitalization.	15
III	Management of Working Capital : Meaning and Concept, Importance of adequate working capital, Types of working capital, Determinants of working capital, Computation of working capital (Practical Problems) Operating and Financial Leverage : Meaning, Concept, EBIT &EPS ,Measurement of leverages,	15
IV	Mutual Funds: Concept, importance, Types of Mutual Funds open ended and close ended-Money Market Funds, Income Funds, Bond Funds, Balanced Funds, Equity Funds, International Funds, Specialty Funds, Index Funds, Exchange-Traded Funds Present position of Mutual Funds in India.	15

Reference Books :

1. Financial Management : Prasanna Chandra
2. Financial Management : Text and Problems : M. Y. Khan and P. K. Jain
3. Financial Management : I. M. Pandey
4. Taxman's Financial Management : Ravi M. Kishore
5. Financial Management : Principles and Practice : S. N. Maheshwari

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020

CC-1377F - Financial Management Paper I (Credit-4)

Course Outcome : At the end of this course students will able to.....

CO1 : Understand the concepts in Cost of Capital.

CO2 : Understand the Techniques of evaluation of capital budgeting proposals

CO3 : Demonstrate calculations of Cost of Capital

CO4 : Understand the concepts Corporate Restructuring

Module	Content	Teaching hours
I	Capital Structure: Meaning , Factors to be considered while framing capital structure, capital structure theories: Net income approach, net operating income approach, Traditional theory, Modigliani and Miller approach.	15
II	Cost Of Capital: Meaning, Importance, Measurement of cost of capital (i) specific cost: Cost of debt, Cost of equity shares, Cost of preference shares; (ii) Overall cost: Weighted averages cost of capital. (Practical Problems)	15
III	Capital Budgeting Decision : Meaning, Importance, Techniques of evaluation of capital budgeting proposals - Payback period, Accounting rate of return, Net percent value, Internal rate of return, Profitability index (practical problems)	15
IV	Corporate Restructuring Merger & acquisition- motives& benefits ,merger negotiations ,significance of P/E Ratio & EPS Analysis	15

Reference Books :

1. Financial Management : Prasanna Chandra
2. Financial Management : Text and Problems : M. Y. Khan and P. K. Jain
3. Financial Management : I. M. Pandey
4. Taxman's Financial Management : Ravi M. Kishore
5. Financial Management : Principles and Practice : S. N. Maheshwari

B.B.A. Part I Sem-V
CBCS Syllabus with effect from 2020

CC-1376E - Recent Trends in Marketing - I (Credit-4)

Course Outcome : At the end of this course students will able to.....

CO1: To understand importance of marketing information.

CO2: To describe marketing communication and future medium of Communications

CO3: To find out reasons of customer dissatisfaction and delight

CO4: To distinguish between rural marketing and agro marketing

MODULE	CONTENT	Teaching Hours
I	Marketing Information System - Meaning and Characteristics, Elements or Components of MIS, Need for MIS, Benefits of MIS.	15
II	Marketing Communication and Direct Marketing - Meaning and Concept of Marketing Communication, Process of Integrated Marketing Communication, Factors determining - Marketing Communication Mix, Future Medium of Communication - WEBS & INTERNET. Direct Marketing - Meaning, Forms of Direct Marketing	15
III	Customer Relationship Management (CRM) - Meaning, Changing, Nature of Customer relationship, Customer relation, Customer dissatisfaction and delight, e-CRM, Customer strategy for building customer relationship.	15
IV	Rural Marketing - Meaning, Definition, Concept, Characteristics of Rural Market, Reasons for growth of Rural Market, Segmenting & Targeting Rural Markets, Problems in Rural Marketing. Agro Marketing - Objectives and challenges in agricultural marketing.	15

Reference Books :

1. Principles of Marketing - Philip Kotler Gavy Armstrong - Pearson-Prentice Hall Ltd., D e l h i .
2. Marketing Management (Text & cases in Indian context) - Dr. Karunakaran - Himalaya Publishing House, Mumbai
3. Rural Marketing - Pradeep Kashap - Pearson-Prentice Hall Ltd., Delhi.
4. Rural Marketing - CSG Krishna - Marharyulud, Lalita Rama - Krishanan - Pearson

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020

CC-1376F - Recent Trends in Marketing - II (Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: To understand the concepts of online and digital marketing

CO2: To elaborate about retailing

CO3: To understand need have study of global marketing

CO4: To understand emerging payment modes

MODULE	TITLE	Teaching Hours
I	Online Marketing - Meaning and Concepts, Merits of online marketing, Demerits of online marketing, Online Marketing Domains, Setting up an online marketing Presence. Digital Marketing- Mobile marketing	15
II	Retail Marketing - Meaning and Functions of retailing, Characteristics of retailing, types of retailing, Retail marketing strategy, Retail Management Activities, Retail Organization Structure, Retailing Scene in India.	15
III	Global Marketing / International Marketing - Meaning, Definition, Objectives / reasons for global marketing, difference between domestic and global marketing, global marketing environment, Marketing -mix strategy for global marketing (i.e. Product, Price, Promotion, Distribution, Strategies.)	15
IV	Emerging payment modes- QR, online And other-advantages and disadvantages News In Marketing - Holistic Marketing, Emotional Marketing experiential marketing, Event Marketing, Consumerism, Marketing Ethics.	15

B.B.A. Part I Sem-V
CBCS Syllabus with effect from 2020
CC-1381- Research Methodology - II (Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: To understand the basic idea of research

CO2: To choose proper sample design

CO3: To analyze data

CO4: To write research report

Module	Title	Teaching Hours
I	Introduction to Research Methodology - Meaning, definition, objective and types of research, significance of research, selection of research problem. Research Design: Meaning, steps in research design, characteristics of good research design.	15
II	Sampling Design and Data Collection - Meaning of sampling, characteristics of good sample design, Types of sample design. Data collection-Meaning, types, of data, methods of collecting primary data- observation, interview questionnaire and schedules, Sources of secondary data.	15
III	Processing and Analysis of data - Classification of data, types of classification, Tabulation, parts of table, types of tables, Graphical presentation of data- Bar - diagram, pie-chart and curves. Analysis and Interpretation of data-meaning, methods of data analysis, techniques of interpretation. Practical- preparing questionnaire, collection of data, use of MS-excel and introduction to SPSS	15
IV	Report Writing Meaning, significance, steps in writing report, logout of the research report, Types of report, mechanics of writing a research report, Precautions for writing research report, Uses of computer in research. Practical- writing a research paper	15

Reference Books :

1. Principles of Marketing - Philip Kotler Gavy Armstrong - Pearson-Prentice Hall Ltd., Delhi.
2. Marketing Management (Text & cases in Indian context) - Dr. Karunakaran - Himalaya Publishing House, Mumbai
3. Rural Marketing - Pradeep Kashap - Pearson-Prentice Hall Ltd., Delhi.
4. Rural Marketing - CSG Krishna - Marharyulud, Lalita Rama - Krishanan - Pearson

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020

CC-1378E- Fundamentals of Business Laws and Tax Laws Paper I
(Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: To understand the Philosophy of Law

CO2: To understand Sale of goods

CO3: To analyze Tax Laws

CO4: To describe Classification of Taxes

Module	Syllabus	Teaching Hours
I	Introduction to Business Law - Meaning and Philosophy of Law - Object of Law - Classification of Law - Justice Delivery System in India - Classification of Courts in India - Meaning and Sources - Business Law.	15
II	The Indian Contract Act 1872 - Definition of Contract - Essentials of Valid Contract - Consideration - Free Consent - Void Contracts - Performance of Contract - Termination and Discharge of Contract - Breach of contract and remedies for breach of contact	15
III	Sale of Goods Act 1930 - Definition of Contract of Sale of goods - Agreement to sell - Essentials of Contract of Sale - Condition and Warranty - Transfer of Property - Transfer of Title - Performance of Contract of Sale - Unpaid Seller and his rights.	15
IV	Tax Laws - Sources of Government revenue - Meaning of Tax - Objectives of Taxes - Classification of Taxes - Tax Laws applicable to Business. (10 Periods)	15

Reference Books:

1. Elements of Mercantile Law - By N. D. Kapoor - Sultanchand & Sons
2. Indian Contract Act - By Avtar Singh - Eastern Book Company
3. Business Law for Managers - Prof. (cmde) P. K. Goel, Biztantra
4. Business Law - By M. C. Kuchal Vikas Publication

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020

GEC-1378F- Fundamentals of Business Laws and Tax Law- II
(Credit-4)

Course Outcome: At the end of this course students will able to.....

- CO1: To understand the Tax Laws
- CO2: To understand Negotiable Instrument Act
- CO3: To describe Intellectual Property Rights
- CO4: To study Consumer Protection Act

Module	Syllabus	Teaching Hours
I	Indian Companies Act 1956 - Definition and Characteristics of Company - Classification of Company - Procedure of Incorporation - Memorandum of Association - Articles of Association - Prospectus - Share Capital - Management of Companies - Qualifications - Appointments - Removal of directors - Company Meetings - Winding up of a Company.	15
II	Negotiable Instrument Act 1881 - Definition - Features of Negotiable Instruments - Types of Negotiable Instruments - Holder and Holder in due Course- Negotiation - Assignment - Endorsement of Negotiable Instrument Crossing of Cheque - its Kind - Dishonour and Discharge of Negotiable Instruments.	15
III	The Consumer Protection Act 1986 - Definitions - Consumer - Service - Complaint - Complainant - Fair and Unfair Trade - Practices - Consumer dispute - Consumers dispute redressal agencies.	15
IV	Intellectual Property Rights and Right to Information Act - Intellectual Property Rights - Trade Marks - Patents - Copy Rights - Industrial Design (Only Concepts) Right to Information Act -Nature and Scope - Right to Information Act	15

Reference Books:

1. Elements of Mercantile Law - By N. D. Kapoor - Sultanchand & Sons
2. Indian Contract Act - By Avtar Singh - Eastern Book Company
3. Business Law for Managers - Prof. (cmde) P. K. Goel, Biztantra
4. Business Law - By M. C. Kuchal Vikas Publication

B.B.A. Part I Sem-V
CBCS Syllabus with effect from 2020

GEC-1375E- Practices in Modern Management (Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: To knowledge about various modern management thoughts.

CO2: To understand the application of management techniques to solve various Management problems.

CO3: To Interpret concept of internal and external organizational environment.

CO4: To Understand the concept of Future manager and its challenges.

Module	Content	Teaching Hours
I	Development of Management Thought: Different Approaches to Management- Classical, Functional, Behavioral, Human relation, Contingency and System Approach. Management by Objectives	15
II	Contribution of Michel Porter: Competitive Advantage- Cost leadership, differentiation - and Focus. Contribution of C.k.Pralhad- Core competency	15
III	Organizational Environment: Internal and External Environment, Environment Analysis- SWOT Analysis, Applicability of SWOT to individual and organization Corporate Governance-concept and importance	15
IV	Management in future: management: Challenges and tasks, skills needed by manager in future, changes in managerial functions and evolving new managerial systems.	15

Reference Books:

1. Management: Concept and Strategies by J. S. Chandan, Vikas Publishing
2. Business Environment and Policy – A book on Strategic Management/Corporate Planning By Francis Cherunilam Himalaya Publishing House 2001Edition
3. Principles & practice of management - Dr. L.M.Parasad, Sultan Chand & Sons - New Delhi
4. Business Environment and Policy – A book on Strategic Management/Corporate Planning By Francis Cherunilam Himalaya Publishing House 2001Edition
5. Principles & practice of management - Dr. L.M.Parasad, Sultan Chand & Sons - New Delhi
6. Principles and Practices of management by shejwalkar Essential of management by Koontz H and Weitrich
7. Principles and practices of Management by T. N.Chabra Management theory and practice,
8. Dr.C.B.Gupta Sultan Chand and sons Publication New Delhi

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020
GEC-1375F- Practices in Modern Management (Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: To Get knowledge about Social responsibility and Ethical Issues.

CO2: To Describe the concept of Time and event management.

CO3: To Interpret concept Stress and Disaster management.

CO4: To Understand the concept of Strategic management.

Module	Title of the Topic	Lectures
I	Social Responsibilities and Business Ethics: Concept of Social Responsibility – Areas of Social Responsibility. Concept of Ethics, Ethical issues in business.	15
II	Time and Event Management: Meaning, Importance and Techniques of Time Management, Concept and Importance of Event Management, Types of Events. (Case Study)	15
III	Stress and Disaster Management: Definition, causes, types of Stress, Management of stress. Meaning of Disaster, Types of Disaster and managing Disaster. (Case Study)	15
IV	Strategic Management: Introduction, Definition, Meaning Nature, Scope and Importance of Strategic Management, Levels of Strategies, Process of strategic management, Different phases of strategic management	15

Reference Books:

- 1) Management: Concept and Strategies by J. S. Chandan, Vikas Publishing
- 2) Business Environment and Policy - A book on Strategic Management/Corporate Planning By Francis Cherunilam Himalaya Publishing House 2001Edition
- 3) Principles & practice of management - Dr. L.M.Parasad, Sultan Chand & Sons - New Delhi
- 4) Business Environment and Policy - A book on Strategic Management/Corporate Planning By Francis Cherunilam Himalaya Publishing House 2001Edition
- 5) Principles & practice of management - Dr. L.M.Parasad, Sultan Chand & Sons - New Delhi
- 6) Principles and Practices of management byshejwalkar Essential of management by Koontz H and Weitrich Principles and practices of Management by T. N.Chabra Management theory and practice,
- 7) Dr.C.B.Gupta Sultan Chand and sons Publication New Delhi

B.B.A. Part I Sem-V
CBCS Syllabus with effect from 2020

GEC-1379E- Foundation of Human Skills (Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: To develops different human skills among

CO2: To enhance quality behavior.

CO3: To increase Emotional Quotient by learning values.

CO4: To Understand communication skills and personal ability.

Module	New syllabus	Teaching Hours
I	<p>Basics Of Human Skills Introduction to Human skills, Types of human skills - Reading, Writing, Listening, Speaking. Basic abilities - Muscular, sensor, mental, social and conceptual. Use of basic abilities in organizational life.</p>	15
II	<p>Understanding Self And Others Understanding self and others through Johari Window. Journey of self discovery. Analysis of strength and weakness. Goal settings to overcome weakness. Learning - Concepts, Principles of learning, learning through reinforcement, learning through feedback's, learning by observations, learning through experience.</p>	15
III	<p>Human Attitudes And Values Attitudes - concept, components of attitudes. The attitude formation process. Values- Importance of values, sources of values, five universal values (Truth, Righteous conducts, Peace, Love, Non-violence) & sub values.</p>	15
IV	<p>Communication Meaning- Four functions of communication-control, Motivation, Emotional expression, Information, Characteristics of communication. Written communication- preparation of Resume. Oral communication- Facing an Interview.</p>	15

Reference Books:

1. Basic Managerial Skills For All- E.H. McGrath (Prentice Hall of India Ltd.)
2. Human Values For Managers- Chakraborty
3. Organizational Behavior Through - M.N. Mishra (Himalaya Publishing House)
4. Indian Philosophy- S.D. Bagade (Himalaya Publishing House)
5. Total Quality Management - Luthans Fred
6. Organizational Behavior- Tilak Raj Bhardwaj (A Mittal Publication)
7. Education to Human Values - Edwin Flippo

B.B.A. Part I Sem-VI
CBCS Syllabus with effect from 2020

GEC-1379E- Foundation of Human Skills (Credit-4)

Course Outcome: At the end of this course students will able to.....

CO1: Describe new skills in management.

CO2: Elaborate the concept of personality and different Theory of personality.

CO3: Understand skill development method and interpersonal skill.

CO4: Understand the concept of career management.

Module	New syllabus	Teaching Hours
I	<p>New Skills In Management Creative style - Emotional Intelligence (E.Q.) - Leadership skills, work style- sales competencies, sports mental skills, conflict management, stress management, Team role skills critical thinking skills, computing skills.</p>	15
II	<p>Personality Meaning- Aspects of personality, Development of personality: Erickson's eight life stages, Jung's Personality Theory, Traits in influencing organizational behavior. Locus of control. Problem solving styles.</p>	15
III	<p>Skills Development Decision making skills, Methods used to develop decision making skills- In the basket, Business games, case studies. Interpersonal skills- Meaning, Methods Used to develop interpersonal skills-role playing, Behavior modeling, sensitivity Training, Transactions Analysis - structural Insight.</p>	15
IV	<p>Utilizations of skills Career Management - Career stages model, basic career - Anchors - Security, Autonomy, creativity, Functional competence, Managerial Competence, factors affecting career choices, career opportunities in management.</p>	15

Reference Books:

1. Basic Managerial Skills For All- E.H. McGrath (Prentice Hall of India Ltd.)
2. Human Values For Managers- Chakraborty
3. Organizational Behavior Through - M.N. Mishra (Himalaya Publishing House)
4. Indian Philosophy- S.D. Bagade (Himalaya Publishing House)
5. Total Quality Management - Luthans Fred
6. Organizational Behavior- Tilak Raj Bhardwaj (A Mittal Publication)
7. Education to Human Values - Edwin Flipp

Nature of Question Paper

Duration: 2Hours-

Total Marks - 40

- Instructions:-** 1) All Questions are compulsory
2) Figures to the right indicate full marks.

	Nature of Questions	Marks
Q.1	Broad Question	14
	OR	
	Broad Question	
Q.2	Write Short Answers(Any Two)	16
	a)	
	b)	
	c)	
	d)	
Q.3	Write Short Notes(Any Two)	10
	a)	
	b)	
	c)	
	d)	

INTERNAL MARKS

BBA- III

FOR ALL SUBJECTS

INTERNAL MARKS

10 marks

Home assignments

05 marks

Seminars

05 marks

“Dissemination of Education for Knowledge, Science and Culture”
- Shikshan Maharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur
(Autonomous)



DEPARTMENT OF BIOTECHNOLOGY ENTIRE

B.Sc. Part - III
Semester-V & VI

SYLLABUS

Under Choice Based Credit System
To be implemented from Academic Year 2020-2021

To be implemented from Academic Year 2020-2021
B.Sc - III (Semester-V-and Semester-VI) Biotechnology-Entire

Course Structure

Paper No.	Course code	Title of Old Paper	Title of New Paper	Percentage of Change (%)	No. of Credits
Semester V					
I	DSE-1355 E	Basics in Genetic Engineering	Basics in Genetic Engineering	10	2
II	DSE-1356 E	Industrial Biotechnology	Industrial Biotechnology	10	2
III	DSE-1357 E	Applications of Biotechnology in Agriculture	Applications of Biotechnology in Agriculture	10	2
IV	DSE-1358 E	Developmental biology	Developmental biology	10	2
Semester VI					
I	DSE1355 F	Advances in Genetic Engineering	Advances in Genetic Engineering	10	2
II	DSE1356F	Food and Microbial Technology	Food and Microbial Technology	10	2
III	DSE1357 F	Applications of Biotechnology in Health	Applications of Biotechnology in Health	10	2
IV	DSE1358 F	Bioinformatics	Bioinformatics	20	2

DSE-1360 (Practical VIII)	Techniques in Genetic engineering and Bioinformatics	DSE- 1362 (Practical - X)	Techniques in Agricultural and health Biotechnology
DSE - 1361(Practical IX)	Techniques in Industrial Biotechnology	DSE -1363 (Practical -XI)	Project

B.Sc. Biotechnology Entire CBCS
Basics in Genetic Engineering DSE-1355-E
Total Credit=02; Marks= 50

Course Outcomes: At the end of this course students will be able to:

- CO 1. Understand the concept of cloning
- CO2. Demonstrate the techniques of DNA fingerprinting
- CO 3. Perceive knowledge about sequencing technology.
- CO 4. Illustrate the importance of probe designing

Topic No.		Lectures 30
Credit I		
1	<p>Enzymes in r-DNA technology Introduction and Scope, Enzymes and its applications, Restriction enzymes- types (I, II, III), nomenclature, recognition sequences, cleavage patterns, modification of cut ends (linkers and adaptors), Alkaline phosphatases, DNA ligases T4 and <i>E. coli</i> Ligases, Reverse Transcriptases, Polymerases- Klenow enzymes, T4 DNA polymerases, Taq DNA polymerases, Polynucleotide kinase.</p> <p>Cloning Vectors: Introduction, Properties of good vectors , Cloning & expression vectors, Types- <i>E.coli</i> vector- plasmid – pBR 322 and pUC18 Bacteriophage vectors – □ phage vector, M 13 Vectors (□ replacement e. g. EMBL 3, EM BL 4 and □ insertional e.g □ gt 10 and □gt 11) Cosmid vector, Phagemid vector e.g pBlue script II KS/SK, Yeast vector- YAC and BAC , Animal vectors – Retroviral , Plant vector – Ti plasmid,Ri plasmid, shuttle vector- e.g pJBD 219.</p>	15
Credit II		
2.	<p>Nucleic Acid Hybridisation : Probe Preparation ,Methods of labelling probes. Radio labelling – Nick translation, End labeling, Primer extension, Non Radiolabelling – Biotin, dioxygenin, fluorescent dyes, Applications of probes.</p> <p>DNA Sequencing and blotting technique Maxam Gilbert method , Sanger Coulson method, Automated DNA sequencing, Southern Blotting, Northern Blotting, Western blotting .</p>	15

References:

1. Molecular Biotechnology – Principles & applications of Recombinant DN,
& Padtranak
2. Gene cloning & manipulating – Christopher
3. An introduction to genetic engineering – Nicholl D.S. T.
4. Principle of gene manipulation: An introduction to genetic engineering – C
Primrose S. B.
5. Gene VIII – Lewin
6. Fundamentals of Biotechnology – S. S. Purohit
7. Fundamentals of Biotechnology – H. S. Chawala
8. Genetic engineering – P. K. Gupta
9. Principle of Biochemistry – Wilson & Walker
10. Plant genetic engineering – P. K. Gupta
11. Molecular Biotechnology of gene – S. N. Jogdan
12. Protein Biotechnology – M. Philopse
13. Molecular Biotechnology – Principle & practices by Channarayappa
14. Biotechnology – R. C. Dubey 15. Molecular cloning (Vol I, II, III)
and Russel

Biotechnology Entire CBCS
Industrial Biotechnology DSE-1356-E
Total Credit=02; Marks= 50

Course Outcomes: At the end of this course students will be able to:

CO1. Construct the design required to set up industrial fermentation.

CO2. Draw a contrast between industrial & pilot fermentation

CO 3. Discover various ways of media formulation for industrial scale.

CO 4. Predict & illustrate the nature of industrial processes.

Topic No.		Lectures 30
Credit I		
1	<p>Introduction to Industrial Biotechnology Concept and range of fermentation technology, Types of fermentations (Batch, continuous, dual, multiple), Concept of solid state & submerged fermentation. Microbial metabolic products- Primary & Secondary products. Basic design of fermenter Components of fermenter and their functions, Fermentation economics Types of fermenter- Stirred tank fermenter, Airlift fermenter, Tower fermenter.</p> <p>Microbial Screening, Scale up and strain improvement Primary and secondary screening, Primary screening of antibiotics, organic acids and amines, enzymes, vitamins and amino acid producers, volatile component degraders, organisms using specific carbon and nitrogen sources. Secondary screening of antibiotic producers, Scale up of fermentations, Strain improvement- concept and methods - mutation, genetic recombination. Maintenance and preservation of industrially important cultures. Microbiological assay-</p>	15
Credit II		
2	<p>Fermentation Media Composition of typical fermentation media, Criteria for typical fermentation medium, Types of fermentation media, General role of media components- water, carbon source, nitrogen source, minerals, precursors, growth factors, buffers, antifoams, oxidation-reduction potentials, inducers, inhibitors. Optimization of media- Plackett and Burmann design , Factors affecting fermentation process .</p> <p>Downstream Process and Product Recovery</p>	15

	<p>Downstream Processes in fermentation and bioprocess technology Solid and liquid separation, Flocculation and Flotation, filtration and centrifugation, Cell disruption by solid and liquid shear, ultrasonication, enzyme action and mechanical disruption.</p> <p>Product recovery and purification- principle, Precipitation, Crystallization, Liquid-Liquid extraction, Distillation (Fractional and Steam), evaporation, Chromatographic separation (Principles), Adsorption and concentration, Membrane filtration, drying and packing.</p>	
--	---	--

References :

1. Text Book of Biotechnology - Dr. H. K. Das
2. Industrial Microbiology & Biotechnology - Arnold L.
3. Fermentation Technology - Jayanto Acharekar
4. Basic Biotechnology - Colin and Bjorn
5. Frontiers in Microbial Biotechnology - Bisel P.S.
6. Industrial Microbiology - Prescott and Dunn
7. Principle of Fermentation Technology - Stanbury P.F., Whitekar H., Hall S.
8. Bioprocess Engineering : Principles - Nielson T. and Villadeson J.
9. Industrial Microbiology- L.E. Casida
10. Fermentation Biotechnology- H.A. Modi
11. Industrial Microbiology- A.H.Patel

Biotechnology Entire CBCS

Application of Biotechnology in Agriculture DSE-1357-E Total Credit=02; Marks= 50

Course Outcomes: At the end of this course students will be able to:

- CO1. Outline the importance of Hybridization & mutation in crop improvement.
- CO2. Explain the techniques of artificial seed germination.
- CO 3. Discuss the strategies to develop transgenic plants
- CO 4. Formulate biofertilizer.

Topic No.		Lectures 30
Credit I		
1	<p>Methods for crop Improvement Introduction and Acclimatization, Breeding for self and cross pollinated plants and vegetatively reproducing plants, selection (clonal pure line and mass), Hybridization and Mutation breeding.</p> <p>Plant tissue culture techniques for crop improvement -Somaclonal variations, Haploids, Micropropagation, Somatic embryogenesis.</p> <p>Somatic hybridization- Definition, protoplast, fusion technique, selection of hybrids, symmetric and asymmetric hybrids, cybrid production.</p> <p>Germplasm Conservation- Introduction, <i>In-situ</i> conservation, <i>Ex-situ</i> conservation, cryopreservation, Techniques of Cryopreservation, applications, limitations.</p>	15
Credit II		
	<p>Transgenic Plants Herbicide resistant - Glyphosate resistance, Phosphinothricin resistance, Fungal and Bacterial disease resistance approaches- PR proteins, Chitinase, Glucanase, RIPs protein, Virus resistance - Virus coat proteins, Movement proteins ,Trasmission proteins ,Satellite RNAs, Antisense RNAs, Ribozymes, Insect resistance approaches - Bt protein (Bt Cotton, Bt-Brijal) , Non Bt protein, Transgenic plant with improved nutrition - Golden Rice, Molecular farming. GM Foods, ethical & socio-economic, legal and environmental issues. Forms of protection -IPR and IPP- Patents, copyright, trademark ,trade secret and PBR</p> <p>Biofertilizers -</p>	15

	Definition ,Principle , Mass production and field application - <i>Rhizobium, Azotobacter, Azospirillum, Acetobacter, Azolla, Cyanobacteria</i> , PSB, VAM. Biopesticide - Definition, production and applications of Bacterial, fungal, viral and Plant origin Biopesticides.	
--	--	--

References :

- 1) Biotechnology - U. Satyanarayana
- 2) A textbook of plant breeding - B.D. Singh
- 3) Medical biotechnology - S. N. Jogdand
- 4) Advances in Biotechnology- S.N.Jogadand
- 5) Introduction to plant breeding - R. C. Chaudhary
- 6) A textbook of Biotechnology - R. C. Dubey
- 7) Pharmaceutical Biotechnology - S. P. Vyas ,V. K. Dixit
- 8) Biotchnology - B. D. Singh
- 9) Fundamentals of agriculture biotechnology - S. S. Purohit
- 10) Animal & cell biotechnology - Ian, Freshney
- 11) Animal cell biotechnology - Buttler
- 12) Methods in cell biology - Volume 57
- 13) Cell and Developmental Biotechnology.-Raj narian Desikar
- 14) Agricultutre application of Microbiology- Neeelima Rajvaidya.

Biotechnology Entire CBCS
Developmental Biology (Plant and Animal) DSE-1358-E
Total Credit=02; Marks= 50

Course Outcomes: At the end of this course students will be able to:

CO 1. Learn the concept of apomixes & polyembryony

CO2. Understand the mechanism of self incompatibility.

CO3. Classify different characters & biological functions of embryo development.

CO 4. Elaborate the mechanism of regeneration.

Topic No.		Lectures 30
	Credit I	
1	<p>Plant Development: Major phases of plant development Vegetative development: Meristem, shoot development, root development, leaf development. Reproductive development: ABC model. Model systems to understand plant development-Arabidopsis. Meristem organization: Plant meristem, organization and differentiation, Organization of shoot apical meristem, Organization of root apical meristem. Plant Embryology Gametogenesis and Fertilization in plants: Gametogenesis in Plants, Development of male and female Gametophyte, Process of fertilization in Angiosperm. Embryogenesis- establishment. Development of Endosperm, Types of endosperm in Angiosperm. Apomixis: Introduction, Definition, Types, Significance. Polyembryony: Introduction, Definition, Types, Significance. Self incompatibility: Definition, types and its genetic control.</p>	15
	Credit II	
2	<p>Animal embryology Gametogenesis, gametes and fertilization in Animals: Gametogenesis in animals, Types of eggs and sperms in animals, Fertilization in animals. Early development in animals: Types and patterns of cleavages in animals, Cell specification and axis formation, Blastulation, gastrulation in frog and chick up-to the formation of three germ layers, Embryonic induction, Foetal membranes, Types and significance of</p>	15

	placentae. Differentiation and Regeneration : Cell lineages, Determination, Commitment -specification and determination, Differentiation, Dedifferentiation, Redifferentiation, Transdifferentiation, Developmental Plasticity. Regeneration : Definition, mechanism, factors affecting regeneration French flag anatomy-concept	
--	--	--

References:-

1. Development Biology, 9th edition, (2010), Gilbert S.F. (Sinauer Associates, USA).
2. Foundations of Embryology - Patten
3. Cell and Developmental Biotechnology - Raj Narian Desikar
4. Text book of Bryophytes, Pteridophytes , Gymnosperms and Paleobotany - Subramurti
5. Plant Anatomy and Embryology- S.N. Pandey, A. Chadha
6. David M. Hill, Craig Martiz and Barke Mable, Molecular systematics
7. Plant Anatomy - E.Cutter.
8. The Embryology of Angiosperm - Bhojawani .S.S and Bhatnagar.S.P (Vikas Publ House, New Delhi)
9. An Introduction to the Embryology of Angiosperm. - P. Maheswari.
10. Principles of Development, 4th edition (2010), Wolpert L and Tickle C, Publisher: Oxford University Press, USA.
11. Burgess J. (1985) An Introduction to Plant Cell Development (Cambridge Univ Press, UK)
12. Taiz L, Zeiger E (2010) - Plant physiology (Sinauer Associates, USA).
13. Sharma HP (2009) - Plant embryology: Classical and experimental (alpha sci)
14. Steeves TA & Sussex IM (2004) - Patterns in plant development. (Cambridge Univ Press, Cambridge, New York)

Biotechnology Entire CBCS
Advances in Genetic Engineering DSE-1355-F
Total Credit=02; Marks= 50

Course Outcomes: At the end of this course students will be able to:

- CO 1. Reflect the importance of chemical synthesis of DNA.
- CO2. Differentiate various types of PCR & their applications.
- CO 3. Appreciate the importance of screening.
- CO 4. Study impact of GM foods on human health.

Topic No.		Lectures 30
Credit I		
1	<p>Isolation of Gene Isolation desired gene from DNA, Isolation of specific gene with PCR, cDNA and genomic library . Screening of libraries- immunological screening and colony or plaque hybridization.</p> <p>PCR and its application Primer designing , Fidelity of thermostable enzymes. Steps in PCR reaction, Types of PCR - RT-PCR,real time PCR, touchdown PCR, hot start PCR, colony PCR, Applications-site directed mutagenesis, Molecular diagnostics, viral and bacterial detection Introduction to molecular identification -- 16 s r RNA18 s r RNA, and Bar code</p>	15
Credit II		
2	<p>Cloning methodologies Construction of plasmid - e. g. Somatostatin, Insertion of foreign DNA into host cells, Agrobacterium mediated gene transfer, Transformation, Transfection. Chemical methods- CaCl₂ precipitation, poly cation mediated gene transfer. Physical methods- Liposomes, microinjection, electroporation, biolistics transfer. screening of recombinants, Direct selection , Insertional inactivation selection , Blue white selection, Expression based screening (HART) Fluorescent Activated Cell Sorter.</p>	15

	<p>Application of r-DNA technology Production of transgenic- knockout mice, In medicines – Insulin and Somatostatin, Introduction to Gene Silencing, Principle of Si-RNA and Si- RNA technology</p> <p>Molecular Markers Introduction – Morphological , Biochemical, Molecular Markers- RFLP, RAPD, AFLP.</p>	
--	---	--

References :

1. Molecular Biotechnology – Principles & applications of Recombinant DNA : Glick B. R. & Padtranak
2. Gene cloning & manipulating – Christopher
3. An introduction to genetic engineering – Nicholl D.S. T.
4. Principle of gene manipulation : An introduction to genetic engineering – Old R.W. & Primrose S. B.
5. Gene VIII – Lewin
6. Fundamentals of Biotechnology – S. S. Purohit
7. Fundamentals of Biotechnology – H. S. Chawala
8. Genetic engineering – P. K. Gupta
9. Principle of Biochemistry – Wilson & Walker
10. Plant genetic engineering – P. K. Gupta
11. Molecular Biotechnology of gene – S. N. Jogdan
12. Protein Biotechnology – M. Philopse
13. Molecular Biotechnology – Principle & practices by Channarayappa
14. Biotechnology – R. C. Dubey
15. **Molecular cloning (Vol I, II, III) – Sambrook and Russel**

Biotechnology Entire CBCS
Food and Microbial Biotechnology DSE-1356-F
Total Credit=02; Marks= 50

Course Outcomes : At the end of this course students will be able to:

- CO 1. Choose appropriate fermentation technology.
- CO2. Compare classical & Modern fermentation techniques.
- CO 3. Outline the importance of preservation.
- CO 4. Study characteristics of food supply.

Topic No.		Lectures 30
Credit I		
1	<p>Microbial Production of Industrial product Concept of pure and mixed culture., Microbial growth kinetics basic concept (Batch, Continuous and Fed Batch). Microbial Production of - Enzymes (amylase -koji fermentation), Antibiotics (Penicillin), Vitamins (B 12), Amino acids (Lysine), Organic acid (Citric acid). Edible mushroom, Single Cell Protein- (Spirulina). yeast</p> <p>Fermented Foods and Beverages Dairy Products - Cheese, Yoghurt, Indian Foods - Idli, Bakery Products - Bread , Fermented Pickles - Sauerkraut, Beverages - Beer, Wine (Red table and white table), Champagne</p>	15
Credit II		
2	<p>Food Spoilage, preservation & toxicity Types of spoilage- Physical, Chemical and Biological (auto and microbial), Preservation methods- High and Low temperatures, Controlled atmosphere and Anerobiosis, Radiations and Asepsis, Chemical preservatives (Salt, sugar, organic acids,SO₂, NO₂). Food Toxicity - Mycotoxin (Aflatoxin), Exotoxin (<i>Staphylococcal</i>), Neurotoxin (Botulinum), Food borne illness- Shigellosis, Amoebiosis, Aspergillosis.</p> <p>Impact of GM food on human health Principle, Risk analysis and Regulations, Multidisciplinary perspectives of GM foods and impact, Public health principles Characteristics of food supply for public health, Food Safety, Capacity to supply nutritional adequacy, Sustainability, Capacity for Consumer choice, Accessibly and affordability to all.</p>	15

References :

1. Text Book of Biotechnology - Dr. H. K. Das
2. Industrial Microbiology & Biotechnology - Arnold L.
3. Fermentation Technology - Jayanto Acharekar
4. Basic Biotechnology - Colin and Bjorn
5. Frontiers in Microbial Biotechnology - Bisel P.S.
6. Industrial Microbiology - Prescott and Dunn
7. Principle of Fermentation Technology - Stanbury P.F., Whitekar H., Hall S. J.
8. Bioprocess Engineering : Principles - Nielson T. and Villadeson J.
9. Industrial Microbiology- L.E. Casida
10. Fermentation Biotechnology- H.A. Modi
11. Industrial Microbiology- A.H.Patel
12. Food Biotechnology- Varun Mehta

Biotechnology Entire CBCS
Application of Biotechnology in Health DSE-1357-F Total
Credit=02; Marks= 50

Course Outcomes: At the end of this course students will be able to:

- CO 1. Appreciate the exigency of stem cell technology
- CO2. Classify different types of vaccines
- CO 3. Explain the mechanism of hybridoma technology.
- CO 4. Predict the nature of forensic medicines.

Topic No.		Lectures 30
Credit I		
1	<p>Stem cells and Transgenic Technology Characteristics of stem cells , Concept of stem cell progenitors, concept of stem cell technology and its application, Transgenic technology & cloning in mammals, Transgenic mice and their applications, Transgenic cattle.</p> <p>Vaccines- Principle and Practices Concept and types of vaccine, Subunit vaccines- Hepatitis B vaccine, Foot and Mouth disease Vaccine, AIDS Vaccine, DNA Vaccines, Edible Vaccines, Recombinant vaccines- Cholera Vaccine, Vaccinia Virus Vaccine.</p>	15
Credit II		
2	<p>Monoclonal Antibodies- Introduction, Hybridoma Technology, Applications- Diagnostics , Therapeutics , Protein purification and Abzymes.</p> <p>Biosensors- Introduction, Principle, Types (Amperometric, Thermometric, Optical biosensor, Immuno biosensor), Applications</p> <p>Gene Therapy - Introduction , Approaches-<i>ex vivo</i> (Therapy for Adenosine deaminase deficiency) and <i>in vivo</i> gene therapy (Gene therapy strategy for cancer), Antigene and antisense therapy , antisense therapy for cancer</p> <p>Public health Introduction, DNA sample preparation, Methods of Diagnosis - Nucleic acid hybridization (Radioactive and Non</p>	15

	radio detection). Detection of infectious disease (Tuberculosis, Malaria, AIDS, Chaga's) Detection of genetic diseases (cystic fibrosis, Sickle cell Anemia, Huntington's, DMD). Types of Epidemic, Pandemic Endemic diseases with at least one example.	
--	--	--

References:

- 1) Biotechnology - U. Satyanarayana
- 2) A textbook of plant breeding - B.D. Singh
- 3) Medical biotechnology - S. N. Jogdand
- 4) Advances in Biotechnology- S.N.Jogadand
- 5) Introduction to plant breeding - R. C. Chaudhary
- 6) A textbook of Biotechnology - R. C. Dubey
- 7) Pharmaceutical Biotechnology - S. P. Vyas ,V. K. Dixit
- 8) Biotechnology - B. D. Singh
- 9) Fundamentals of agriculture biotechnology - S. S. Purohit
- 10) Animal & cell biotechnology - Ian, Freshney
- 11) Animal cell biotechnology - Buttler
- 12) Methods in cell biology - Volume 57
- 13) Cell and Developmental Biotechnology.-Raj narian Desikar
- 14) Text Book of Bryophytes, Pteridophytes, Gymnosperms,
and Paleobotany- Subramurti.
- 15) Agricultutre application of Microbiology- Neeelima Rajvaidya .

**Biotechnology Entire CBCC
Bioinformatics DSE-1358-F
Total Credit=02; Marks= 50**

Course Outcomes: At the end of this course students will be able to:

CO 1. Outline the importance of Human Genome Project.

CO2. List different types of structural database.

CO 3. Explain the importance of phylogenetic analysis.

CO 4. Construct drug molecules.

Topic No.		Lectures 30
Credit I		
1	<p>Introduction to Bioinformatics History of bioinformatics: Multidisciplinary approach of bioinformatics, Computers in Biology and Medicines, Internet, and related programs; Networking HTTP, HTML, WAN, LAN, MAN, applications in communication.</p> <p>Introduction to Genomics: Introduction, Databases, Data, Nucleic acid sequence database, Gene Bank, EMBL, DDBJ. Sequence retrieval system (SRS): Entrez, DBGet. Human Genome Project (HGP), Goal and applications, final draft of HGP (complete information resources covered).</p> <p>Literature Database: Pub Med and Pub Med central Introduction to Proteomics: Primary Protein sequences databases, Secondary sequences Databases, Structural Databases related to proteins (PDB, , MMDB, CATH, SCOP)</p>	15
Credit II		
2	<p>Sequence Alignment and Phylogenetic analysis Sequence Alignment: Pair wise sequence alignment, Multiple sequence alignment, Local and Global sequence alignment.</p> <p>Phylogenetic analysis: Introduction: Definition of phylogenetic tree, nodes, internodes, root, tree, styles; cladogram, phenogram, curvogram, Steps involved in construction of phylogenetic tree Phylogenetic analysis tools: ClustalW.</p>	15

	<p>Drug designing Structure-based drug designing: Introduction; Structure-based drug designing approaches, Target Identification and Validation, homology modeling, active site analysis and pharmacophore mapping, and Molecular Docking. Ligand-based drug designing: Introduction; Ligand-based drug designing approaches, Lead Designing, combinatorial chemistry, High Throughput Screening (HTS), Chemical libraries, ADME property.</p>	
--	---	--

References:

1. Bioinformatics methods and applications. S. C. Rastogi, N. Mendiratta, P.Rastogi.
2. Principle of bioinformatics. P. Shanmughavel.
3. Computational Drug Designing. David C. Young
4. Computational Drug Design: A Guide for Computational and Medicinal Chemists. David C. Young
5. An introduction to Bioinformatics. T. K. Attwood, Parry-Smith D. J.
6. A textbook of bioinformatics. Sharma, Munjal, Shankar.

**(Practical - VIII) Techniques in Genetic Engineering and Bioinformatics
DSE-1360**

Sr. No.	Practical		
	Techniques in Genetic engineering and Bioinformatics Major Practical's		
1.	Calculation of molecular size of digested DNA	01	Major
2.	Western blotting technique	01	Major
3.	Southern blotting technique	01	Major
4.	C-DNA cloning by Reverse Transcription RT- PCR	01	Major
5	Protein analysis by RASMOL	01	Major
6.	Phylogenetic Tree using Clustal W.	01	Major
7.	Pair wise and Multiple sequence alignment.	01	Major
	Techniques in Genetic engineering and Bioinformatics Minor Practical's		
1.	DNA Amplification by PCR	01	Minor
2.	Ligation of DNA	01	Minor
3	Construction of restriction map of plasmid DNA	01	Minor
4	PUBMED and PUBMED Central database	01	Minor
5	Getting the gene sequences from primary DNA sequence.	01	Minor
6	Getting the Protein sequences from Protein Database.	01	Minor
7	Calculation of PI/MW of protein.	01	Minor

DSE-1361(Practical- IX) - Techniques in Industrial Biotechnology

Sr. No.	Practicals		
1	Primary screening of amylase producers by Replica Plate technique	01	Major
2	Screening and isolation of antibiotic producing organism from soil (Crowded plate/ Giant colony method).	01	Major
3	Production and partial purification of enzyme (Amylase)	01	Major
4	Study of Immobilization of enzyme (Amylase).		
5	Production of alcohol/ wine and estimation by colorimetric method and by specific gravity method.	02	Major
6	Production of sauerkraut.	01	Minor
7	Mushroom Cultivation.	01	Minor
8	Production, Recovery and estimation of Citric Acid	01	Minor
9	Bioassay) a of Primary metabolite (Growth factor)	01	Major
10	(Bioassay) a of Secondary metabolite (Antibiotic)	01	Major
11	Isolation and identification of spoilage causing pathogen from spoiled foods.(Salmonella and Staphylococci)	02	Major
12	Analysis of Milk - a) Isolation of Lactic acid bacteria from dairy product.	01	Major
	b) SPC of milk	01	Major
	c) Direct microscopic count of milk	01	Minor
	d) MBRT	01	Minor
13	Compulsory Local Industrial Visit (within 100 km distance) - Wine Industry/ Food Processing Industry/Fermentation unit. (Strictly as per rule of state government by ST/college bus only)	-	-

DSE-1362 (Practical- X)- Techniques in Agricultural and Health Biotechnology

Sr. No.	Practicals	15	
1	Isolation of <i>Azotobacter</i>	01	Major
2	Isolation of <i>Rhizobium</i> from root nodules	01	Major
3	Isolation of PSB from soil.	01	Major
4	Production of Biofertilizer- <i>Azotobacter</i> / <i>Rhizobium</i>	01	Major
5	Isolation of <i>Bacillus Agrobacterium</i> Spp	01	Minor
6	Antibiotic sensitivity test using paper disc method	01	Minor
7	Determination of Minimum inhibitory Concentration (MIC) of antibacterial compound.	01	Minor
8	<i>Agrobacterium</i> mediated transformation in (dicot) plants	01	Minor
9	Isolation of Blood genomic DNA	01	Minor
10	RAPD analysis	01	Major
11	RFLP analysis	01	Major
12	Study of Protoplast fusion and regeneration	01	Minor

DSE-1363- (Practical- XI) - Project Work

Guidelines –

1. Projects can be performed in group (maximum 2) or individually.
2. Selection of the Project topic and allotment of project supervisor.
3. Preparation of Project Execution Plan: Time and Resource Allocation
4. Separate practical session should be organized for preparation of following topics –
 - a) Selection of problem, preparation of synopsis.
 - b) Introduction.
 - c) Review of literature
 - d) Materials and Methodology
 - e) Result and discussion
 - f) Bibliography.
5. Guidance by the Project Supervisor, for the self-study of relevant course topics and concepts by the student.
6. Self-study and reference work of relevant topics and concepts by the student.
7. The Project Work must involve practical work (wet lab.) related to selected discipline
8. Students are expected to work on “Project Work” for about 10 periods per week.
9. The project work must be allotted individually.
10. The student invests his energy, time and resources in a project. The project therefore should, if possible, have important bearing on some practical aspect. This will help student to justify his efforts on project.
11. It is the joint responsibility of student and project supervisor to maintain daily register book of his/her project work and has to be produced at the time of examination if asked.
12. Submission Process: Student should prepare 2 copies of the Project Report. At the beginning, the respective Project Supervisor must approve both copies positively before university examination. Then respective Head or Coordinator approves both copies of the Project Report.
13. The student has to submit one of these approved copies of project report, duly signed by the project Supervisor and Principal, before practical examination. The report will be assessed by both Internal examiner (The project supervisor), who will assign the marks out 20 and the external examiner (appointed by university),

who will assign marks out of 30, Thus the total will be out of 50 marks.

14. Theory, practical and project report shall form separate heads of passing.

Practical Examination:

The practical examination will be scheduled as given below; practical examination should be conducted for minimum 5 hours on each day.

For practical examination of :

**DSE-1360-Techniques in Genetic Engineering and
Bioinformatics DSE-1361- Techniques in Industrial
Biotechnology**

DSE-1362-Techniques in Agricultural and Health Biotechnology examination will be conducted in 3 consecutive days each.

DSE-1363- Project

Project separate 2 examiners should be appointed and conducted in 2 consecutive days.

B) Each candidate must produce a certificate from the Head of the Department in his/her college stating that he/she has completed in a satisfactory manner the practical course on the guidelines laid down from time to time by Academic Council on the recommendation of Board of studies and has been recorded his/her observations in the laboratory journal and written a report on each exercise performed. Every journal is to be checked and signed periodically by a member teaching staff and certified by the Head of the Department at the end of staff and certified by the Head of the Department at the end of the year. Candidates are to produce their journal at the time of practical examination. **Candidates have to visit the Biotechnological institutes and satisfactorily complete project work and entrepreneurship as per the syllabus.** The report of the same should be duly certified by the Head of the Department and submit the respective reports at the time of examination.

Nature of Practical Exam Question Paper- 50 Marks

DSE-1355- Techniques in Genetic Engineering and Bioinformatics

- Q.1 Major Experiment - 20 Marks
Q2 Minor Experiment - 10 Marks
Q3 Viva Voice- 05marks
Q4 Spotting - 05 Marks (5 spots- each carry one mark)
Q5 Journal and Practical Note book- 05 and 05 marks each total = 10 marks
Total = 50 marks

DSE-1356- Techniques in Industrial Biotechnology

- Q.1 Major Experiment 20 Marks
Q.2 Minor Experiment 10 Marks
Q.3 Spotting 05 Marks (5 spots- each carry one marks)
Q.4 Tour Report 05 Marks
Q.5 Journal/Notebook 10 (5+5) Marks
Total = 50 marks

DSE-1357- Techniques in Agricultural and Health Biotechnology

- Q.1 Major Experiment 20 Marks
Q.2 Minor Experiment 10 Marks
Q.3 Spotting 05 Marks (5 spots- each carry one marks)
Q.4 viva voice 05 Marks
Q.5 Journal/notebook 10(5+5) Marks
Total = 50 marks

DSE-1358- **Project**

- Q.1 Internal Examination 20 Marks**
A) Regularity and sincerity 10 Marks
B) Research aptitude 10 Marks
Q.2 External Examination 30 Marks
A) **Project report 05 Marks**
B) Review of Literature 05 Marks
C) Material & Methods 05 Marks
D) Result & Discussion 05 Marks
E) Presentation 05 Marks
F) Viva-Voce 05 Marks
Total = 50 marks

Annual Practicals of Total = 200 marks

Question Paper Pattern Sample

Seat Number _____

VIVEKANAND COLLEGE (AUTONOMOUS), KOLHAPUR

Semester: _____ Examination: _____

Class: _____ Subject: _____ Paper No: _____

Subject Code: _____ Q. Paper Code: _____

Date: _____

Time: _____ Total Marks: 40

- Instructions:** - 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat labeled diagram wherever necessary.

- Q1 Choose the correct alternative and rewrite the following sentences:** 8
- Marks Q2 Attempt any two of the following (two out of three)** 16 marks
- Q3 Attempt any four of the following (four out of six)** 16 marks

Nature of Theory Question Paper- 40 Marks		
Q. No. 1	Multiple Choice based objective type question (four options for each question be given)	08 Marks
Q. No. 2	Attempt any two of the following (out of three)	16 Marks
Q. No. 3	Attempt any four of the following (4 out of 6)	16 Marks
	Total	40 Marks

Internal Marks evaluation - for 10 Marks in the form of either of the following as Short answer/ one-word answer Assignment/ short note/ MCQ/ long answer/Seminar/Fill In the Blanks etc and attendance of the students for it is Compulsory.

*******End of Syllabus*******

“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur (Autonomous)



B.SC. COMPUTER SCIENCE ENTIRE

Part - III

Semester-V &VI

Syllabus

Under Choice Based Credit System

To be implemented from Academic Year 2020-21

B.Sc. Part-I (Computer science Entire) CBCS Syllabus with effect from June, 2020

Structure of the course
To be implemented from June 2020

Theory

Semester - V

Semester V (Total credits= 6)

Sr. NO.	Paper Code	Title of the paper	Internal Mark	External Mark	Total Mark
1	AECC-F1	Communication skill -I	10	40	50
2	DSE-1305E	Core java and operating system	20	80	100
3	DSE-1306E	Data Communication and Software Engineering with UML	20	80	100
4	DSE-1307E	C# Programming and E Commerce	20	80	100
5	SEC-BCSF	PHP Programming	-	50	50

Semester - VI

Sr. NO.	Paper Code	Title of the paper	Internal Mark	External Mark	Total Mark
1	AECC-F1	Communication skill -II	10	40	50
2	DSE-1305F	Advanced Java and Data ware housing and mining	20	80	100
3	DSE-1306F	Computer Networks and C# and introduction to ASP.Net	20	80	100
4	DSE-1307F	Linux OS and Artificial intelligence and Expert system	20	80	100
5	SEC-BCSF	Android Programming	-	50	50

Practical

Sr. NO.	Paper Code	Title of the paper	External Mark	Total Mark
1	1314F	Practical -I	80	100
2	1315F	Practical II	80	100
3	1316F	Project		200

B.Sc. Part-III (Computer science Entire)
Semester - V
Core Java and Operating System DSE-1305E
Theory: 72 Hours (90 Lectures) credits-6

Course Outcome:

- CO 1 :-** To understand structure of java program, jvm, type conversion. Explain and implements programs in java using control statements, method overloading, constructors, array of objects, keywords this and static.
- CO 2 :-** To write program on inheritance, package, abstract class and interfaces, Implement multithreading in object oriented programs. Understand concept of checked and unchecked exception and write exception handling programs.
- CO 3 :-** To tell what is an operating system, its objectives and functions. To classify types of operating system and explain operating system services.
- CO 4 :-** To explain protection, system calls, system programs and application programs. To understand the concept of process management, memory management and file management and deadlocks

Section-I

Unit	Title and Contents	Lectures Allocated
1	<p style="text-align: center;">An Introduction to Java</p> <p>[10] A Short History of Java, Features of Java, Java tools-JDK, JRE, Structure of program compilation and execution of program, JVM, Types of Comments, Types, Final Variable Type Conversions-implicit and explicit conversion , Access input from console (Using Scanner class and command line arguments)</p>	10
2	<p style="text-align: center;">Control statements, Classes and objects</p> <p>[10] Control statements, For- each loop, Var args , Declaring 1D, 2D array, Defining Classes, objects and method-method over loading, Array of Objects, Constructor, Over loading Constructors and use of this "Keyword, Static keyword-static block, static Fields and Methods, methods (equals () , toString()), Wrapper Classes, Finalize () Method</p>	10
3	<p style="text-align: center;">Package, Inheritance and Interface</p> <p>Package-Introduction to all predefined packages, User Defined Packages. Access Specifies, Inheritance-Types of Inheritance-single, multilevel, hierarchical inheritance, Method Overriding, Super Keyword, final keyword, Abstract class and abstract methods, Defining and Implementing Interfaces,</p>	15
4	<p style="text-align: center;">Exception Handling and Multi threading</p> <p>[10] Exception Handling- Concept, types- Checked and unchecked, try and catch block, multi ple catch, Try-catch -finally block, throw and throws clause, finally clause, Multithreading- What are threads?, difference between process and thread, Life cycle of thread, methods of thread class, Runnable interface, is Alive() and join() methods, Thread priorities , Running multiple</p>	10

	threads ,Synchronization and inter thread communication wait() , notify(), notify All() methods .	
--	---	--

Section - II

Unit	Title and Contents	Lectures Allocated
1	<p>Operating System over view</p> <p>[10] Introduction and definition of operating system, Objectives and function, Types of operating system, Operating system services, Protection: input output, memory and CPU protection, System calls: types of system calls and system call implementation, System programs and application programs.</p>	10
2	<p>Process Management</p> <p>[11] Process concept, Process states, Process control block (PCB), Context switching, Threads, concept of multithreads, benefits of thread sand types of threads, Process scheduling: scheduling objectives, types of schedulers, scheduling criteria, schedule in algorithms- Preemptive and non- preemptive. FCFS, SJF, priority, round robin, multiple queue, multilevel feedback queue Process synchronization, critical action problem, semaphores.</p>	11
3	<p>Memory Management</p> <p>[12] Logical and physical address map, Swapping, Memory allocation- contiguous memory allocation - fixed and variable partition, internal and external fragmentation and compaction, Paging and virtual memory ,demand paging ,locality of reference, page fault ,dirty page/ dirty bit, page replacement policies FIFO, optimal, LRU, MFU, Disk structure, Disk scheduling-FCFS,SSTF,SAN,LOOK,CSCAN,CLOOK</p>	12
4	<p>File management and Dead locks</p> <p>File concept ,access methods- sequential and direct ,file types and operations, Directory structure- single level, two level, tree structure, acyclic graph ,general graph directory structure , Allocation method- contiguous, linked and indexed, Definition of dead lock, characteristics Dead lock prevention, detection and recovery</p>	12

References:

- 1) Complete reference Java by Herbert Schildt (5th edition)
- 2) Java 2 programming black books, Steven Horlzner
- 3) Programming with Java, A primer, For the edition, By E. Balaguru samy
- 4) Operating System Concepts- Silber schatz, Galvinand Gagne (8th edition)
- 5) System Programming and Operating System - D. M. Dhamdhare
- 6) Operating System by a Godbole Tata Mcgraw - Hill Publishing

Practical Program List Core Java

1. Program on type conversion

2. Program on Control Structure
3. Program on method over loading and over riding
4. Program on Packages
5. Program on constructor
6. Program on Inheritance
7. Program on Arrays
8. Program on Exception Handling

Operating System

1. Write a program to implement copy command of DOS.
2. Write a program to display date and time of system
3. Write a program to implement pwd command of linux.
4. Write a program to implement wc command of linux.
5. Write a program to implement string function without using library functions.
6. Write a program to count number of vowels and consonants.
7. Write a program to implement md, cd, rd command.
8. Write a program to implement type command.
9. Write a program to implementer name command.
10. Write a program to implement cat command

**CBCS Syllabus with effect from June, 2020
Semester- V**

**Data Communication and Software Engineering with UML DSE-1306E
Theory: 72 Hours (90 Lectures) credits -6**

Course Outcomes:

CO 1 :- To understand the fundamental concept and components of Data Communication system. To Explain Concept of network, advantages and disadvantages, categories and architectures of network. To explain types of transmission media and types of transmission modes. Understand multiplexing and switching techniques. Explain network devices, protocols and elements of protocol and standards.

CO 2 :- To understand functions of physical layer, digital to analog conversion methods, analog to digital Conversion methods . Understand Data link layer design issues, Framing, Error detection, and Error correction and flow control. To understand the basics of software and software engineering. To learn what is system's development life cycle.

CO 3 :- To learn and understand what are traditional and latest process models, learn and know what agile development is. To learn different fact finding techniques, which serve as a basis for requirements analysis and gathering, understand the importance of SRS in s/w development.

CO 4 :- To study use of Unified modeling language. To learn how to draw UML diagram. To understand and learn to select suitable UML diagram for our software system. To understand the basics of software testing

Section-I

Unit	Title and Contents	Lectures Allocated
1	<p>Basics of Data communication</p> <p>[10] Concept of data communication, Components-sender, receiver, message, Transmission media, Data Representation, Data Flow-Simplex, Half-duplex, and Full-duplex, Networks: Definition, Advantages and disadvantages, Categories of Networks-LAN, WAN, MAN, Network Architecture-Client-Server and Peer to Peer.</p>	10
2	<p>Transmission media and modes</p> <p>Transmission Media Guided Media- Twisted- Pair Cable, Coaxial cable and Fiber Optic Cable, Unguided Media: Radio Waves, Microwaves, Infrared Waves. Transmission Modes: Parallel, Serial- Asynchronous, Synchronous, Isochronous</p>	11
3	<p>Multiplexing, Switching and Network Devices</p> <p>[11] Multiplexing: Frequency-Division Multiplexing, Wave length-Division Multiplexing Time Division Multiplexing, Switching: Circuit switching-data gram and virtual Switching, Packet Switching and Message Switching, Network Devices: Repeater, Hub, Bridge, Switch, Router, Gateway, B router,</p>	11

	Modem. Protocols and Standards, Protocols: concept, syntax, semantics, Timing, Standards.	
4	Physical Layer and Data Link Layer [13] Physical layer: Digital-to-analog conversion: concept, Amplitude Shift Keying, Frequency, Shift Keying, Phase Shift Keying, Analog-to- digital conversion: Pulse Code Modulation (PCM), Delta Modulation (DM), Data link layer: Design issues, Framing, error Detection and Correction	13

Section-II

Unit	Title and Contents	Lectures Allocated
1	Introduction to software engineering and process models [12] Definition of software, definition of software engineering, characteristics of software, System Development Life Cycle (SDLC), phases of SDLC, Software process models: Traditional models- Water fall model ,Proto typing model, Spiral Model, Introduction to Agile software development-concept, advantages, types- scrums, extreme programming(XP).	12
2	Introduction to Requirements Analysis [10] Requirement anticipation and investigation, Fact finding methods- Interviews, Questionnaires, observation, recorder view, Software requirements specification (SRS)- need of SRS, characteristic of SRS, structure of SRS, Types of requirements - functional and non- functional	10
3	Introduction to UML and UML Diagrams- I [11] Introduction to UML- concept of UML, advantages of UML, applications of UML, Classification of UML diagrams, Use case diagrams- overview, identifying actors and use cases, communication and relationships, example, Class diagrams: classes and objects, association and links, multiplicity, inheritance, example. State machine diagram-states, event, composite state, transition, activity, and example.	11
4	UML Diagrams- II and introduction to Software Testing [12] Interaction diagrams- over view, Sequence Diagram- concept, activation, example, Activity diagram- concept, activities, actions, decisions, control nodes, fork and join node, example, Software Testing over view- concept, Testing fundamentals, Types of testing- Unit testing, Acceptance testing (α / β), Integration testing, Black box testing, White box testing.	12

Reference Books:

1. James F. Kurose, University of Massachusetts, Amherst Keith W. Ross, Polytechnic

- University, Brooklyn -Computer Networking: A Top-Down Approach, 4th Edition, Pearson.2008
2. Behrouz A.Forouzan- Data Communications And Networking-(4th edition) Mc Graw-Hill.2007.
 3. Tanenbaum A.S. "computer Network", 3rd Edition, Prentice Hall of India.2004.
 4. Stalling W, "computer communication Network" . (4th edition). Prentice hall of India 1993
 5. System Analysis and design and Introduction to Software Engineering- Parthsarathi, B.W. Khalkar.
 6. UMLTM2 Tool kit By Hans- Erik Eriksson, Magnus Penker, Brian Lyons, David Fado
 7. An Integrated Approach To Software Engineering by Pankaj Jalote edition3
 8. Fundamentals of Software Engineering- Rajib Mall edition 3
 9. Software Engineering- R.S.Pressman edition3
 10. The Unified Modeling Language Reference Manual by James Rumbaugh, Ivar Jacobson, Grady Booch second edition by Addison-Wesley
 11. Object Oriented Software Engineering using UML, Patterns and Java third edition pearson publication
 12. Object Oriented Software Engineering by Ivar Jacobson (Pearson Edu. INC)

CBCS Syllabus with effect from June, 2020
Semester - V
C# Programming and E-Commerce DSE-1307E
Theory: 72 Hours (90 Lectures) credits-6

Course Outcomes:

CO 1 :- To understand the Event driven & sequence driven programming, to explain .net framework architecture, understand assembly, namespace, garbage collector & JIT Compilers .

CO 2 :- To understand data types, operators, conditional, unconditional & looping statements. To understand how to write function & procedures Understand class, object, & OOP concepts.

CO 3 :- To understand different controls in window application, events & properties of controls, the process of Electronic commerce and Business strategy involved in it and security concerns while doing online businesses

CO 4 :- To appreciate ethical implications of professional practice. Be aware of global perspectives. Analyze features of existing e-commerce businesses, and propose future directions or innovations for specific businesses.

Section-I

Unit	Title and Contents	Lectures Allocated
1	<p>Introduction</p> <p>[10] Event driven & sequence driven programming, Introduction to c# , . net framework architecture, Assembly Name space, Garbage collect or JIT compilers</p>	10
2	<p>Data Types & Control Structure</p> <p>[12] Variables, expressions, constants, Data Types, Operators, implicit & explicit conversions Conditional statements, Loop statements, Unconditional statements, Functions, Procedures</p>	12
3	<p>Working with Classes</p> <p>[12] Class & objects, Constructors, Inheritance, Polymorphism</p>	12
4	<p>Developing GUI applications with Win Form</p> <p>[11] Different controls in win form – Forms, textbox, labels, buttons, radio buttons, check box, combo box, list box, Date time picker, Important properties of controls, Important event of each control, Menus, built in dialog box –input box, message box, Mouse events –click, double click, enter, hover, leave, move, Keyboard events – key press, key down, key-up .</p>	11

Section-II

Unit	Title and Contents	Lectures Allocated
-------------	---------------------------	---------------------------

1	Introduction [10] History, Overview, Definition of E-commerce, Scope & Goals of E-Commerce, Advantages and Disadvantage of E-commerce, Applications of E-commerce, Challenges of E-commerce. Roadmap of e-commerce in India, Traditional commerce Vs E-commerce.	10
2	Electronic Data Interchange (EDI) [15] Meaning of EDI. History of EDI, EDI Working Concept .EDI Model, EDI Standards, Implementation difficulties of EDI. Advantages and Disadvantage of EDI, Ecommerce Business Models (B2B,B2C,C2C,C2B,B2G,G2G,G2C), E-commerce marketing and business strategies, Social networks and online communities,History and Development, Use of Internet. Domain Names Internet Service provider. World Wide Web,Uniform Resource Locator. Web Browsers, Email, Voicemail, Web Search Engines .	15
3	E-Payment Systems [10] Electronic Payment concept. Steps for Electronic Payment, Types of E- Payment Systems-Prepaid, Postpaid,Electronic fund Transfer.Net Banking, Case Study on the Websites dealing with E-Commerce, Survey of ATM Center, Create Website with minimum details, Logon to trade Website and make a trial order for purchase of an item.	10
4	Security Issues and Threats [10] Secure Transaction concept- Authentication & Authorization, Privacy on Internet, Computer Crime Types and laws. Viruses- Types of Attacks Vulnerability of Internet Sites. Denial- of- Service attacks, Cryptography Encryption, Decryption, SSL- SET, Firewall, Digital Certificates. Digital signatures.	10

References:

- 1) E-Commerce: The Cutting Edge of Business, Kamlesh K. Bajaj & Debjani Nag, Tata McGraw Hill
- 2) Kenneth C. Laudon, E-Commerce: Business, Technology, Society, 4th Edition, Pearson
- 3) C.S.V. Moorthy E- Commerce concepts, Models, Strategies-Himalaya Publications, New Delhi.
- 4) e-Commerce Strategy, Technologies and Applications, David Whiteley, McGraw Hill International
- 5) E-Security, Electronic Authentication and Information Systems Security Sundeep Oberoi, TMG
- 6) E-Commerce by S. Jaiswal- Galgotia Publications.
- 7) C#4.0 The Complete Reference Schildt H. Edition- 2010 Publication-Tata Mc Graw Hill
- 8) .Net 4.5 programming Black Book Kogent Edition- 2013 Publication- dream Techpress

Practical list:

1. Program to find no. of denomination sofa given amount
2. Program to find sum of numbers between 200 to 600 which are divisible by 6

3. Program to read number „n“ and digit d & check whether d is present in n, and if yes check how many times
4. Program to read number „n“ & print out digit by digit as a series of words using function.
5. Program to find area of rectangle, triangle & circle using interface.
6. Program. To find volume of cube, cylinder & rectangle using method overloading.
7. Program to per form following operation on form.
<ul style="list-style-type: none"> • Form-size- maximum, minimum & restore • Color- Blue, yellow & green • Exit
8. Create a window application for employee. Following information should be accepted
Empid, name, birth date, joining date, basic, hra%, da% & following information should be calculated & displayed in appropriate control. Age, retirement date, total HRA, total DA & total salary.

CBCS Syllabus with effect from June, 2019
Semester: V Skill Enhancement course-II
PHP Programming
Theory: 30 Hours (38 Lectures) credits-2

Course outcome:

- CO 1 :- Get basic knowledge of PHP programming .
- CO 2 :- To implement functions , strings , arrays and objects .
- CO 3 :- Get the basic knowledge of data bases using for web programming .
- CO 4 :- To earns skill set to develop online information system using the open source PHP.

Unit	Title and Contents	Lectures Allocated
1	<p style="text-align: center;">Introduction to PHP</p> <p>[10] What does PHP do? ,A walk through PHP- forms, databases, graphics, Language basics- lexical structure- case sensitivity, statements and semicolons, white spaces and line breaks, comments, literals, identifiers, keywords, Data types- integers, floating point numbers, strings, Booleans, arrays, Variables- variable references, scope, garbage collection, Expressions and operators, Flow control statements- if, switch, while, for, for each ,try...catch, declare, exit and return, go to.</p>	10
2	<p style="text-align: center;">Functions and strings</p> <p>[10] Calling a function, defining a function, Variable scope, function parameters, Return values, Variable functions, Anonymous functions, Quoting string constants, Printing strings, cleaning strings, Comparing, manipulating and searching strings, Regular expressions.</p>	10
3	<p style="text-align: center;">Arrays and objects</p> <p>[10] Indexed versus associative arrays, Identifying elements of an array, Storing data in arrays, Multi dimensional arrays, Extracting multiple values, Converting between arrays and variables, Traversing arrays, Objects-terminology, creating an object, accessing properties and methods, Declaring a class- methods, properties, constants, inheritance, interface.</p>	10
4	<p style="text-align: center;">Web technique and databases</p> <p>[10] HTTP Basics, variables, processing forms, setting response headers, Using PHP to access a data base, PHP data objects, My SQLi object interface, SQL its, Mongo DB, Case study</p>	10

CBCS Syllabus with effect from June, 2020

Semester-VI

Advanced Java and Data ware housing and mining DSE-1305F

Theory: 72 Hours (90 Lectures) credits -6

Course outcomes

- CO 1 :-** To create a full set of UI Widgets using Abstract Windowing Toolkit (AWT) & Swings. Learn to access database through Java programs, using Java Data Base Connectivity (JDBC). Create dynamic web pages using Servlets .
- CO 2 :-** To create dynamic web pages using JSP. To understand Data Warehousing, Working of data warehouse, Data Warehouse applications. To understand types of data Warehouse, Difference between Data Warehouse (OLAP) and Operational Database (OLTP).
- CO 3 :-** To understand and explain concept of data mining, Process of knowledge discovery in databases (KDD). To Explain Data Objects and Attribute Types. To Understand Data Preprocessing and Data Quality. To Understand Data Preprocessing and Data Quality .
- CO 4 :-** To explain major tasks in Data Preprocessing. To understandmarket basket analysis and explain Apriori algorithm. To understand concept of Classification. To understand regression analysis, Concept of clustering and explain K-means Clustering algorithm .

Section-I

Unit	Title and Contents	Lectures Allocated
1	<p align="center">User Interface Components with AWT and Swing</p> <p>[19]</p> <p>Awt- What is AWT? classes hierarchy, windows fundamentals Frame Windows Event Classes, Mouse Event Class, Action Event Class, Window Event Class, Event Listener Interface: Mouse Listener, Action Listener, Window Listener and Key Listener, AWT Controls: Labels, Text Field, Pushbuttons, Layout Managers (Flow Layout, Border Layout, Grid Layout, Card Layout), Swing- What is Swing? Difference between AWT and Swing., The MVC Architecture and Components –J Frame, J Button, J Label, J Text, J Text Area, J Check Box and J Radio Button, J List, J Combo Box, J Menu, J tabbed Pane , J Scroll Bar , Dialogs (Message, confirmation, input)</p>	19
2	<p>JDBC</p> <p>What is JDBC? Steps for connectivity between Java program and data base ,□Type of drivers,Simple program- data base operations like creating tables, CRUD (Create, Read, Update, Delete) operations using SQL .</p>	7
3	<p>Servlet</p> <p>[10]</p> <p>Introduction of servlet: How servlet work, model diagram, Uses of servlet, Life cycle of servlet, Servlet API: packages- javax.servlet and javax.servlet.http , Session Tracking Mechanisms, Http Session, Cookies, URL-Rewriting, Hidden- Form Fields .</p>	10
4	<p>JSP</p> <p>[10]</p>	10

Introduction, Jsp Life Cycle, Jsp Implicit Objects & Scopes, Jsp Directives 1.page2.include3.taglib , Jsp Scripting Elements- 1.declaratives2.scripting expressions , Simple application using JSP, Difference between JSP and Servlet
--

Section-II

Unit	Title and Contents	Lectures Allocated
1	<p>Introduction to data ware housing</p> <p>[10] What is Data Ware housing?, How Data ware house works? ,Why a Data Ware house is Separated from Operational Data bases, Data Ware house Applications, Types of Data Ware house ,□Difference between Data Ware house (OLAP) and Operational Database(OLTP) .</p>	10
2	<p>Introduction to data mining</p> <p>[10] What is data mining?, Process of knowledge discovery in databases (KDD), Getting to Know Your Data, Data Objects and Attribute Types, What Is Attribute, Nominal Attributes , Binary Attributes, Ordinal Attributes, Numerical Attributes , Discrete versus Continuous Attributes.</p>	10
3	<p>Data preprocessing and association rule mining</p> <p>[10] Data Preprocessing: An Overview,□Data Quality: Why Preprocess the Data?,□Major Tasks in Data Preprocessing, Data Cleaning (Missing Values, Noisy Data) , Data integration , Data Transformation , Data reduction, Data Discretization ,Association Rule Mining, Market basket analysis, Apriori algorithm.</p>	10
4	<p>Classification, prediction and clustering</p> <p>Classification, Classification Requirements, Classification vs Prediction, Issues related to Classification and Prediction ,□Decision tree ,□Prediction ,□Regression analysis ,□Clustering: What Is Cluster Analysis? Different Types of Clustering, K-means: The Basic K-Means Algorithm.</p>	15

Practical Program List

1. Program on Swing
2. Program on AWT
3. Program on Database Connection
4. Program on cookie and Session
5. Program on Servlet
6. Simple application using JSP.

References:

1. Complete reference Java by Herbert Schildt (5th edition)

2. Java 2 programming black books, Steven Horlzner
3. Programming with Java, A primer ,Forth edition ,By E.Balagurusamy
4. Jiawei Han and Micheline Kamber, " Data Mining Concepts and Techniques", Morgan Kaufmann Publishers, USA, 2006.
5. Berson "Data Ware housing, Data Mining and OLAP",Tata Mc Graw Hill Ltd, New Delhi, 2004.
6. Pang- Ning Tan, Michael Stein bach,Vipin Kumar, Introduction to Data Mining, Pearson Education
7. Arun K Pujari, "Data mining techniques", Oxford University Press,London,2003.
8. Dunham MH," Data mining: Introductory and Advanced Topics". Pearson Education, New Delhi, 2003
9. Mehmed Kantardzic, "Data Mining Concepts, Methods and Algorithms", John Wiley and Sons, USA, 2003.
10. Soman K.P.,Diwakar Shyam, Ajay V., Insightin to Data mining: Theory and Practice, PHI,2006

CBCS Syllabus with effect from June, 2020
Semester - VI
Computer Networks and C# and introduction to ASP.Net DSE-1306F
Theory: 72 Hours (90 Lectures) credits-6

Course Outcomes:

CO 1 :- To understand Flow control protocols-Sliding window protocol, One bit sliding window protocol, protocol using go back N, Protocol using selective repeat. Explain design issues, concept of routing, routing algorithms and Congestion Control algorithms.

CO 2 :- To explain transport layer service primitives, TCP, UDP protocol. Understand session layer services, Remote Procedure Call(RPC), Presentation layer services, Concept of cryptography and types of cryptography. To explain Functions of application layer, application layer protocols (DNS, HTTP, SMTP, Telnet and FTP) and network security.

CO 3 :- To explain Functions of application layer, application layer protocols (DNS, HTTP, SMTP, Telnet and FTP) and network security. To get knowledge different types of errors, structured & unstructured exception, to understand how to trace errors.

CO 4 :- To understand database connection, connected & disconnected architecture, data binding to controls, data validations. Understand & Generate Reports from database using crystal report. Get Basic introduction to ASP.net, understand different ASP.net controls, understand concepts of Master Page.

Section-I

Unit	Title and Contents	Lectures Allocated
1	<p style="text-align: center;">Data Link Layer Protocols, Network Layer</p> <p>[10] Protocols- Sliding window protocol: one bit sliding window protocol, protocol using Go Back N, protocol using selective repeat, Network Layer: Design issues, Concept of Routing.</p>	10
2	<p style="text-align: center;">Network Layer and Transport Layer</p> <p>[12] Routing Algorithms (Shortest Path, Flooding, Distance Vector Routing), Congestion Control Algorithms: Leaky Bucket, Token Bucket, transport Layer: services: connection oriented and connection less services, Transport Layer Primitives: listen, connect, send, receive, disconnect. Protocols: TCP, UDP</p>	12
3	<p style="text-align: center;">Session and Presentation layer</p> <p>[11] Session layer: Services: dialog management, synchronization, activity Management, exception handling Remote procedure calls (RPC), Presentation Layer: Services- Translation, compression, encryption, Cryptography-Concept, Symmetric key and A symmetric key Cryptography.</p>	11
4	<p style="text-align: center;">Application layer and network security</p> <p>[12]</p>	12

Application layer: Function, Protocols- Domain name system (DNS), Hyper text transfer Protocol (HTTP), Simple Mail Transfer Protocol (SMTP), Telnet, File Transfer Protocol (FTP), Network security: Security concept and services, Message Authentication, Digital Signatures and Entity authentication	
--	--

Section-II

Unit	Title and Contents	Lectures Allocated
1	<p>Exception Handling</p> <p>[10]</p> <p>Errors- types of errors, Structured Exception - Try Catch End Try, finally, throw, Unstructured Exception-On error Go To, resume, resume next, Tracing Errors- Break Point, watch window, quick watch window, autos .</p>	10
2	<p>Data base Connectivity in C#</p> <p>[12]</p> <p>Data base: Connections, command, Data adapters, and data sets, Connection to data base using MS- Access, SQL Server, Data binding with controls like Text Boxes, List Boxes, Data grid etc. Data form wizard, Data validation.</p>	12
3	<p>Using Crystal Report</p> <p>[12]</p> <p>Connection to Data base, Table, Queries, Create and Modify Report, Formatting Fields and inserting Header, Footer, Group, Details Working with formula fields, Parameter fields, Working with Multiple Tables.</p>	12
4	<p>Introduction to ASP.Net with c#</p> <p>[11]</p> <p>Introduction to ASP.NET, Working with web forms: Buttons, Text Boxes, Labels, Check Boxes, Radio Buttons, Tables, Panels, Images, Image Buttons, List Boxes, Drop- Down Lists, Hyper links and Link Buttons .</p>	11

Program list

1. Create a log in form with User Id, password, current date. Check the user Id & password from table & give proper message.
2. Create a window application for saving account of a customer with a/c no, name, update, opbal, mode of payment. If mode of payment is check then get cheque number. Add data to saving transaction table with fields a/cno, debit amount, credit amount, balance, tdate, mode of payments, satus. Generate add, edit, delete operations
3. Create a window application that created bit & credit activities to the saving transaction table. Balance should be made. (e.g. check a/c no with the master file & display name). check balance before debit the amount.
4. Create crystal report for Saving Master list.
5. Create customer bill with master detail transactions
6. Generate customer bill with crystal report .

References:

1. Behrouz A.Forouzan- Data Communications And Networking- (4th edition)McGraw-Hill.2007
2. Tanenbaum A.S. "computer Network", 3rd Edition, Prentice Hall of India.2004.
3. Stalling W, "computer communication Network". (4th edition).Prentice hall of India 1993
4. C#4.0 The Complete Reference Schildt H. Edition - 2010 Publication- Tata Mc Graw Hill
5. .Net4.5 programming Black Book Kogent Edition- 2013 Publication- Dream Techpress
6. ASP.Net4.0 Black Book Edition-2010 Publication- Dream Tech Press

CBCS Syllabus with effect from June, 2020
Semester-VI
Linux OS and Artificial intelligence and Expert system DSE-1307F
Theory: 72 Hours (90 Lectures) credits -6

Course Outcome:

- CO 1 :-** To understand the linux basics- shell, kernel, general purpose utilities, directory handling commands, file handling commands
CO 2 :- To implement basic filters, understand environment variables.
CO 3 :- To use VI editor and its different commands. To write shellscripts and run them
CO 4 :- To write shell scripts using different conditional and looping statements.

Section-I

Unit	Title and Contents	Lectures Allocated
1	<p style="text-align: center;">Linux Basics</p> <p>[15] What is an OS? What is Linux, history of Linux, Linux distribution, The shell, kernel, Linux file system, login, logout, Different general purpose utility commands(GPU)-cal, date, bc, who, Concept of directory, home directory, directory handling commands- PWD, cd, mkdir, rmdir, ls, relative and absolute path, Basic file attribute smet a chracters, Access permission chmod command, File handling commands- cat,cp, mv, rm, lp, man, pipe.</p>	15
2	<p style="text-align: center;">Basic filters</p> <p>[10] What is a filter, head, tail, sort, grep, sed, awk, Regular expressions and its types, Environment variables-PATH,USER,HOME,UID,TERM,SHELL Concept of process, PID, PS, KILL, FREE.</p>	10
3	<p style="text-align: center;">VI editor</p> <p>[7] What is the VI editor- command mode, insert mode, last line mode, VI editing commands, moving within a file, saving and closing the file, Command mode movement, command mode-making changes, repeating VI actions.</p>	7
4	<p style="text-align: center;">Essential shell programming</p> <p>Linux shells, shell scripting, running a shell script, Statements- read, echo, exit, expr, Conditional statements- test, if, case, Looping statements-while, until, for, Positional parameters- set, shift.</p>	13

Section-II

Unit	Title and Contents	Lectures Allocated
------	--------------------	--------------------

1	<p style="text-align: center;">Introduction to Artificial Intelligence</p> <p>[09] Definition of Artificial Intelligence, History of Artificial Intelligence, Goals of A.I., Contributors of A.I., Branches of A.I., Applications of A.I., Why Artificial Intelligence, Advantages of A.I., Disadvantages of A.I., Types of Artificial Intelligence: Type1, Type2.</p>	9
2	<p style="text-align: center;">Introduction to Intelligent System</p> <p>[11] What is intelligence, Types of Intelligence, Components of Intelligence- Reasoning, Learning, Problem Solving, Perception, Linguistic Intelligence, A.I. Agents and environment – concept, definition of agent, definition of environment, Structure of A.I. agent, Rules for A.I. agent, Rational Agent- PEAS representation (Case study of Self Driving Car) examples, Turing test.</p>	11
3	<p style="text-align: center;">Problem Solving in A.I.</p> <p>[13] Concept, Search algorithm terminologies: i) Search- Search Space, Start State, Goal State. ii) Search Tree, iii) Actions, iv) Transition Model, v) Path Cost vi) Solution vii) Optimal Solution, viii) Problem and Problem Space, Types of Search Algorithms: Uninformed- Breadth First Search, Depth First Search, Informed: Heuristic Search – i) Generate and test method , ii) Hill Climbing, Natural Language Processing: concept, definition, natural language processing and understanding, NLP analysis stages.</p>	13
4	<p style="text-align: center;">Introduction to Expert System</p> <p>[12] What are expert systems, Features of expert Systems, Components of Expert System- i) Knowledge base- definition, components of Knowledge base, Knowledge representation , Knowledge Acquisition. ii) Inference Engine – Definition, forward chaining, backward chaining, iii) User Interface, Development of E.S., Limitations of E.S., Applications of E.S.</p>	12

Program List

• Display, copy, move, delete and print files form different directories
• Change file access permissions using chmod and confirm using ls- l command
• Creating text files using VI editor Shell scripts-
1. Write a shell script to get any number and display its square, cube sum of its digits .
2. Write a script to display sequences such as 2 4 6 8 10
0 1 1 2 3 5 8
3. Use of set and shift in a script to use positional parameters.
4. Write a script using case structure to validate inputs

a) Accept only two digit number.
b) Accept employee code such as first character of code must be a letter
c) Accept only four character long string.

Reference books:

- Unix concept and applications -----Sumitabha Das
- Unix shell programming- Yash want Kanetkar
- Artificial Intelligence by-Mrs.Neeta Deshpande Technical Publications Pune.
- Artificial Intelligence Making a system Intelligent by Dr.Nilakshi Jain.
- Artificial Intelligence Elaine Richand Kevin Knight, Tata Mc Graw Hill edition 3.

CBCS Syllabus with effect from June, 2020
Semester: VI Skill Enhancement course-II
SEC-IV Android Programming
Theory: 30 Hours (38 Lectures) credits-2

Course Outcomes

- CO 1 :- To understand the Event driven & sequence driven programming, to explain.net frame work architecture, understand assembly, namespace, garbage collector & JIT Compilers
- CO 2 :- Understand data types, operators, conditional, unconditional & looping statements. To understand how to write function & procedures
- CO 3 :- Understand class, object, & OOP concepts
- CO 4 :- Understand different controls in window application, events & properties of controls.

Unit	Title and Contents	Lectures Allocated
1	Fundamentals & developments of Android What is android, setting up development environment, Dalvik virtual machine & apk file extension. How to setup Android Development Environment . Android development Frame work- Android- SDK, Android Project Frame work	9
2	Android Activities & UI Design Understanding Intent, Activity, Activity Lifecycle and Manifest, Creating Application and new Activities Expressions and Flow control, Android Manifest Simple UI- Layouts and Layout properties, Fundamental Android UI Design Introducing Layouts Creating new Layouts, Draw able Resources Resolution and density independence (px,dip,dp,sip,sp) XM L Introduction to GUI objects viz. Push Button Text /Labels Edit Text, Toggle Button, Weight Sum Padding Layout Weight	11
3	Advanced UI Programming Event driven Programming in Android (Text Edit, Button clicked etc.)Creating splash screen, Event driven Programming in Android . Android Activity Lifecycle - Creating threads for gaming requirement Understanding the Exception handler. Different controls in win form – Forms, textbox, labels, buttons, radio buttons, check box, combo box, list box, Date time picker, Important properties of controls, Important events of each control, Menus, built in dialog box - input box, message box, Mouse events – click, double click, enter, hover, leave, move, Keyboard events – key press, key down, key-up	13
4	Toast, Menu, Dialog, List and Adapters What is Menu? Custom Vs. System Menus Creating and Using Hand set menu Button (Hardware) What are Android Themes. What is Dialog? How to create an Alter Dialog? What is Toast in Android? List & Adapters Manifest.xml File Update	12

List of basic Android tutorials, that you can follow in order to make the first basic steps in the Android World:

Android Layouts and Views

- Android Frame Layout Example
- Android Linear Layout Example
- Android Image View Example
- Android Text View Example
- Android Button Example

Android Click and Drag

Listeners

- Android On Click Listener Example
- Android Drag and Drop

Example Android Styles and UI

Elements

- Android Styles and Themes Example
- Android Toast Example
- Android Tool bar

Example Android

Activities

- Android Activity Transition

Example Android Development

- Building Android Applications with Gradle
- **Android Project migration from Eclipse to Android Studio**

**VIVEKANAND COLLEGE, KOLHAPUR
(AUTONOMOUS COLLEGE)**

Board of Studies in Foundry Technology

Choice Based Credit System Pattern

Syllabus

For

B. Voc. Part-III

B. Voc in Foundry Technology

(To be implemented from Academic Year 2020-2021 onwards)

STRUCTURE OF SYLLABUS:

To be implemented from the academic year 2020-2021

1. Title of the course: B.VOC IN FOUNDRY TECHNOLOGY

2. Preamble of the syllabus:

The proposed curriculum is with the view to make it more contextual, industry affable and suitable to cater the needs of society and nation in present day context. The committee examined the nature of the existing syllabus of various courses in foundry technology and after analysing other curricula of existing universities in respective subjects in terms of content, relevance, quality and pattern of teaching and examination, has synthesized the present proposal. After guidance from industry professionals, consultants and senior faculty, feedbacks from the core faculty and intensive discussions the syllabus is suitably finalized.

The syllabus needs revision in terms of preparing the student for the professional scenario with relevance to practical needs and requirements. A holistic approach includes providing industry training via on job training/internships, handling live projects, visits to foundry units. Regular expert's interaction will help to build a bridge between students and industry.

Technical advancement is the key to a substantial teaching system in today's world and thus a great responsibility lies on the curriculum to prepare students to rise to meet global standards and align seamlessly to changing trends.

3. Objectives:

To enable the students-

- To promote understanding of basic facts and concepts in foundry process while retaining the excitement of foundry industry.
- To make students capable of studying foundry technology in academic and Industrial courses.
- To expose the students to various emerging new areas of foundry technology and apprise them with their prevalent in their future studies and their applications in various spheres of manufacturing technology.
- To develop problem solving skills in students.
- To expose the students to different processes used in Foundry Industries and their applications.
- To develop ability and to acquire the skill and knowledge of terms, facts, concepts, processes, techniques and principles of foundry industries.
- To develop ability to apply the skill and knowledge of contents of principles of foundry technology.
- To inquire of new skill and knowledge of foundry technology and developments therein.
- To expose and to develop interest in the fields of foundry technology.

4. Duration:

The duration of the B.Voc. Course will be of **three years**.

•**B.Voc. Part I - Diploma in Foundry Technology**

•**B.Voc. Part II - Advance Diploma in Foundry Technology**

•**B.Voc. Part III - B. Voc in Foundry Technology**

The final B.Voc degree will be awarded only after completion of three years course. The suggested credits for each of the years are as follows:

Awards		Normal calendar Duration	Skill Component Credits	General Education Credits
Year 1	Diploma in Foundry Technology	Two Semesters	36	24
Year 2	Advanced Diploma in Foundry Technology	Four Semesters	36	24
Year 3	B.Voc in Foundry Technology	Six Semesters	36	24
TOTAL			108	72

General Education Component (i.e. the work in classroom) should not exceed 40% of the total curriculum.

Credits can be defined as the workload of a student in

1. Lectures
2. Practicals
3. Seminars
4. Private work in the Library/home
5. Examination
6. Other assessment activities.

The following formula should be used for conversion of time into credit hours.

- a) One Credit would mean equivalent of 15 periods of 60 minutes each, for theory, workshops /labs and tutorials;
- b) For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops;
- c) For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

5. Medium of Instruction:

The medium of instruction of the course will be **Marathi/English**.

6. Pattern: Credit based Semester Pattern with course outcome.

7. Eligibility:

1. Candidate should be passed Advanced Diploma in ‘Foundry Technology’
2. Candidates having Advanced Diploma in „Cast Iron Foundry Technology“ are also eligible for the B.Voc degree course.
3. Candidates with Advanced Diploma in „Casting Development and Quality Assurance“ are also eligible for the B.Voc degree course.

8. Examination:

A. Scheme of examination:

- The semester examination will be conducted at the end of each term (both theory and practical examination)
- Theory paper will be of 50 marks each. The practical examination will be of 150 marks and industrial practical training/project work of 50 marks in the practical.
- Question papers will be set in the view of the entire syllabus and preferably covering each unit of the syllabus.

For each semester there will be three theory papers. **Practical Examination will be conducted at the end of every semester.**

Paper Number	Title of Paper (For Semester V)	Internal Marks	Theory Exam Marks	Total Marks
I	Secondary Steel Making	10	40	50
II	Quality Control	10	40	50
III	Industrial Management for Foundry	10	40	50
TOTAL		30	120	150

Paper Number	Title of Paper (For Semester VI)	Internal Marks	Theory Exam Marks	Total Marks
IV	Welding and Salvaging Processes	10	40	50
V	Energy Conservation and Pollution Control	10	40	50
VI	Fracture Mechanics and analysis of Failure	10	40	50
TOTAL		30	120	150

The practical examination will be of 200 marks for **each semester**.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	120	Projects/ Industry Training.	50

2	Journal	15		
3	Oral	15		
Total		150		50

The total weightage of each semester is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 50 X 3	150
2	Practical Examination.	200
3	Project Work	50
4	Internship	50
	TOTAL	450

B. Nature of question paper:

For each paper there will be **THREE** compulsory questions.

General nature of the question paper will be:

Question Number	Type		Marks
Q.1	Multiple choice question	No internal options.	8
Q.2	Short answer	Any four out of six	16
Q.3	Long answer	Any two out of three	16

C. Standard of Passing:

To pass the examination a candidate must obtain at least 35% (i.e 14 marks out of 40) in individual subjects, in internal assessment and University examination each in all theory and practical subjects.

D. External Students: Not applicable as this is a practical oriented course.

9. University Term: As per academic calendar of the university

For the third year i.e. B. Voc in Foundry Technology practical examination and theory paper assessment will be done at university level.

10. List of equipment and instruments:

1. Universal sand testing machine
2. Sieve analyser.
3. Mold hardness teller.
4. Molding meter.
5. Demonstrative Cupola
6. Rapid moisture teller.
7. Electric Muffle (1000^oc)
8. Muller (Sand mixing)
9. Metallurgical Microscope = 5/6
10. Metallurgical Microscope with image analysis software = 1

11. Belt abrasive grinder.
12. Bend saw.
12. Cut- off wheel.
13. Lapping wheel for metallography.
14. Coal fired /Gas fired Furnace.
15. Micro Vickers Hardness Tester.
16. Impact testing Machine (with ASTM specimens – set of low & high energies)
17. Manual Broaching Machine.
18. Sub Zero Treatment bath with Digital calibrated temperature indicator.
19. Optical Brinell Hardness Testing Machine.
20. Dynamic Hardness Tester.
21. Digital Hardness Testing Machine.
22. Double Disc Polisher.
23. Medium Abrasive Cutting machine.
24. Hyd. Spec. Mounting Press -Water cooled

11. Workload:

Each skill based paper will have **three theory** periods per week. There are **four practical** per week. Each practical will be based on skill based papers i.e. paper no. I, II, IV, V and VI. The practical batch will have 20 students.

The total workload for one batch will be:

- | | | |
|--|---|-----------------------|
| 1. Three Papers on skill based Education: 3 X 3 | = | 09 Theory Periods. |
| 2. Four Practical work per week: 4 X 4 | = | 16 Practical periods. |
| 3. Project Work per batch per week: | = | 05 Periods. |

TOTAL 30 Periods.

Working hours will be 5 hours (300 minutes) per day i.e. six periods each of 50 minutes.

12. Laboratory Safety Equipments:

Part I: Personal Precautions:

1. All persons must wear safety Goggles at the time of Practical/Training times.
2. Must wear **Lab Aprons / Lab Jacket** and proper shoes.
3. Except in emergency, over – hurried activities are forbidden.
4. Fume cupboard must be used whenever necessary.
5. Eating, Drinking and Smoking in the laboratories is strictly forbidden.

Part II: Use of Safety and Emergency Equipments:

1. First aid Kits

2. Sand bucket
3. Fire extinguishers (dry chemical and carbon dioxide extinguishers)
4. Material Storage cabinet with proper ventilation
5. Material Safety data sheets.
6. Management of Local exhaust systems and fume hoods.
7. Sign in register if using instruments.

13. MEMORANDUM OF UNDERSTANDING (MOU):

The purpose of this MOU is to clearly identify the roles and responsibilities of each party (i.e. college and industry partner) as they relate to the implementation of the **B.Voc. Programme in Foundry Technology** at the college.

It is suggested to sign at least **TWO MOU** with the industry partners in the related field.

14. PROGRAM OUTCOMES (PO's)

1. B. Voc. Graduates in Foundry Technology will demonstrate knowledge of Machine Drawing, Material Science, Gating System Design & Metallurgy to solve actual casting products/processes related problems in Foundries.
2. Graduates will become Innovators & Entrepreneurs to address social, technical and business challenges.
3. B. Voc. Graduates in Foundry Technology will select and apply relevant modern technique and IT Tools to solve complex problems in design and manufacturing of casting components.
4. B. Voc. Graduates in Foundry Technology will be able to understand and solve social, health, legal issues related to foundry.
5. B. Voc. Graduates in Foundry Technology will be able to use appropriate environmental friendly processes for foundry to achieve sustainable growth.
6. B. Voc. Graduates in Foundry Technology will be able to apply ethical business practices in Industry.
7. B. Voc. Graduates in Foundry Technology will be able to work in Industry/Foundry as a team player as well as a team leader.
8. B. Voc. Graduates in Foundry Technology will be able to communicate effectively and professionally at Local to Global level.
9. B. Voc. Graduates in Foundry Technology will be able to apply Project Management Techniques and Financial Management Techniques in foundry.

Program Educational Outcomes:

1. The graduates will apply knowledge gained in course to improve lives and livelihoods through a successful career in Foundry based Companies.
2. The Graduates will engage in lifelong learning such as higher studies & association with professional bodies.

Program Specific Outcomes:

1. B. Voc. Graduates in Foundry Technology will collect and analyze data for solving the problems related with casting by using modeling, analysis & design tools.
2. Make Use of Material Testing Techniques, Sand Testing Techniques & Appropriate Gating Design Techniques for improving quality of product.

B.Voc. Part-III (B.Voc in Foundry Technology)

Course structure

General Structure:

The Degree course has two semesters; each one is of 450 marks. There will be three theory papers for each semester having 50 marks each.

SEMESTER – V

- | | |
|---|--------------|
| 1) Paper-I: Secondary Steel Making | - 50 Marks. |
| 2) Paper-II: Quality Control and Reliability | - 50 Marks. |
| 3) Paper-III: Industrial Management | - 50 Marks. |
| 4) Paper-IV: Project Work-I (Internal Assessment) | - 100 Marks. |

SEMESTER – VI

- | | |
|--|--------------|
| 1) Paper-V: Welding and Salvaging Processes | - 50 Marks. |
| 2) Paper-VI: Energy Conservation and Pollution Control | - 50 Marks. |
| 3) Paper-VII: Fracture Mechanics and analysis of Failure | - 50 Marks. |
| 4) Paper-VII: Project Work-II (Internal Assessment) | - 100 Marks. |

There will be practical examination for each semester. The practical examination will be conducted in **two days** each of six hours. It will be of 150 marks of which 30 marks are reserved for oral and journal. The internal assessment of 50 marks includes industry training via internships, handling live projects, visits to foundry units etc.

SYLLABUS

N. B.

- (i) Figures shown in bracket indicate the total lectures required for the respective units.
- (ii) The question paper should cover the entire syllabus. Marks allotted to questions should be in proportion to the lectures allotted to respective units.
- (iii) All units should be dealt with S.I. units.
- (iv) **Industrial training / tour/visit per semester is compulsory.**
- (v) Use of recent editions of reference books is essential.
- (vi) Use of Scientific calculator is allowed.

B. VOC IN FOUNDRY TECHNOLOGY

SEMESTER V

SKILLED BASED PAPERS:

PAPER XXI: SECONDARY STEEL MAKING

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Information about Steel manufacturing
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	03/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Objectives:

1. To learn special grades of steel.
2. To understand sources of inclusion.
3. To learn the various techniques of secondary steel making.

Course Outcomes (COs):

Course Outcomes (COs): Upon completion of this course, students will be able to		Mapping with PO's
CO 1	Students will able to differentiate the special grades of steel.	1
CO 2	Students will understand the importance of making clean steel.	1

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	2	-	-	-	-	-	-	-	-	-	1
CO 2	2	-	-	-	-	-	-	-	-	-	1

Course contents:

Introduction- Special grade steels, development of secondary steel making and their importance, sources of inclusions, sulphur, phosphorous and gasses in steels, secondary steel making

technologies; Inert gas purging, vacuum degassing- deoxidation; ladle furnace; VOD- theory and practice; Powder injection system; physic chemical and fluid dynamic aspects of powder injection and stirring processes; role of slag and powders in inclusion control, Desulphurization and dephosphurization, cored wire feeding; Production of ultra low S, P and inclusion free steels, ultra low carbon steels; Raw materials for secondary steel making, addition of Ca-Si, ferro alloys etc in ladle lining, properties and selection of refractories.

TextBooks/ReferenceBooks/ OtherBooks/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	YearofE dition
1	Introduction to Modern Steel Making	V.R. Tuppari			
2	Fundamentals of Steel Making	E.T. Turkdogan	The Institute of Materials, London		
3	The Making, Shaping and Treating of Steel		Steel Making and Refining	Vol.- AISE Steel Foundation, Pittsburg, USA	
4	Principles of Foundry Technology	P.L. Jain	Tata McGraw Hill		
5	Principles of Metal casting	R. Heine & Rosenthall	TMH		
6	ASM Metal Handbook			Vol.-4, Casting	
7	Foseco Ferrous Foundryman's Handbook	John R. Brown	Butterworth Heinemann Pub		
8	Foundry Technology	Peter Beeley	Butterworth Heinemann Pub.		

PAPER –XXII: QUALITY CONTROL

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic Knowledge of production
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	03/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
EvaluationScheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Objectives:

1. To learn various approaches of quality.
2. To understand different quality control policies.
3. To understand how to improve the quality using different quality tools.

4. To learn the statistical process control.
5. To learn the reliability.

Course Outcomes (COs):

Course Outcomes (COs): Upon completion of this course, students will be able to		Mapping with PO's
CO 1	Study various approaches of quality	3
CO 2	Understand kaizen, Deming and Juran's quality control policies.	3
CO 3	Study design of experiments using factorial approach and analyze the experiments.	3
CO 4	Discuss various quality improvement processes using charts, block diagram, distribution and QFD.	3
CO 5	Understand statistical processes control in quality and reliability assessment of product.	3
CO 6	Understand and apply Taguchi's experimental design for quality control.	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	-	-	1	-	-	-	-	-	-	2	1
CO 2	-	-	1	-	-	-	-	-	-	2	1
CO 3	-	-	1	-	-	-	-	-	-	2	1
CO 4	-	-	1	-	-	-	-	-	-	2	1
CO 5	-	-	1	-	-	-	-	-	-	2	1
CO 6	-	-	1	-	-	-	-	-	-	2	1

Course contents:

1 Introduction: New culture of TQM, TQM axioms, consequences of total quality managing, cost of total quality, valuable tools for quality, the Japanese factor. The Deming Approach to management: Historical background, Deming's fourteen points for management, deadly sins & diseases, implementing the Deming's philosophy, Deming on management. Juran on Quality: Developing a habit of quality, Juran's quality trilogy, the universal breakthrough sequence, Juran's Deming.

2. Crosby & the Quality Treatment: Crosby diagnosis of a troubled company, Crosby's quality vaccine, Crosby's absolutes for quality management, Crosby's fourteen steps for quality improvement. Imai's Kaizen: The concept, Kaizen & innovation, the Kaizen management practices, Kaizen & Deming.

3. Basic Techniques for Statistical Analysis: Introduction, measures of central tendency & dispersion, confidence intervals, hypothesis testing, frequency distributions & histograms, probability distributions, measuring linear associations. Design & Analysis of Experiments:

Introductions, factorial experiments, aliasing, constructing fractional designs, analysis of variance.

4. Supporting of Quality Improvement Processes: Affinity diagram, bar chart, block diagram brain storming, cause and effect analysis, control charts, cost benefit analysis, customer-supplier relationship check list, decision analysis, flow charts, force field analysis, line graph/run charts, pareto analysis, quality costing, quality function development (QFD), quality project approach & problem solving process, risk analysis scatter diagrams, Weibull analysis, 6 Sigma.

5. Statistical Process Control: Introduction, data collection plan, variables charts, attributes, interpreting the control charts. Taguchi's Approach to Experimental Design & Offline Quality Control: Introduction, background to the method, Taguchi's recommended design techniques, from Deming to Taguchi & vice-versa.

TextBooks/ReferenceBooks/OtherBooks/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Managing for Total Quality From Deming to Taguchi and SPC	N.Logothesis	Prentice Hall of India, New Delhi		2005
2	Designing for Quality	R.F.Lochner&J.E.Mat ar	Chapman & Hall		2001
3	Fundamental of Quality Control & Improvement	A.Mitra	Prentice Hall of India, New Delhi	2nd edition	2003
4	SPC:Concepts, Methodologies and Tools	A. Zaidi	Prentice Hall of India, New Delhi		1995

PAPER –XXIII: INDUSTRIAL MANAGEMENT

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	None
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	03/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Objectives:

1. To understand the various functions of management.
2. To introduce various functional areas of marketing and material management.
3. To understand the various strategies of HR management.

Course Outcomes (COs):

Course Outcomes (COs): Upon completion of this course, students will be able to		Mapping with PO's
CO 1	Apply principles of management and carry out various functions of management.	9
CO 2	Analyze and select financial and marketing strategies of project.	9
CO 3	Apply various strategies of management for Human Resource Planning.	7,9

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1									2	-	-
CO 2									2	-	-
CO 3							1		1	-	-

Course contents:

1. Functions of Management

Definition of Management, Management environment. Planning – Need, Objectives, Strategy, policies, Procedures, Steps in Planning, Decision making, Forecasting. Organizing – Process of Organizing importance and principle of organizing, departmentation, Organizational relationship, Authority, Responsibility, Delegation, Span of control. Staffing – Nature, Purpose, Scope, Human resource management, Policies, Recruitment procedure training and development, appraisal methods. Leading – Communication process, Barriers, remedies, motivation, importance, Theories.

2. Introduction to Marketing and Material Management

a) Marketing: Marketing Concepts –Objective –Types of markets – Market Segmentation, Market strategy – 4 AP's of market, Market Research, Salesmanship, Advertising. b) Materials Management: Definition, Scope, advantages of materials management, functions of materials management, c) Purchase Objectives, 5-R Principles of purchasing, Functions of Purchase

department, Purchasing cycle, Purchase policy & procedure, Evaluation of Purchase Performance.

3. Human Resource Development

Strategic importance HRM; objectives of HRM; challenges to HR professionals; role, Responsibilities and competencies of HR professionals; HR department operations; Human Resource Planning - objectives and process; human resource information system. Talent acquisition; recruitment and selection strategies, career planning and management, training and development, investment in training programme; executive development.

4. Introduction to E- Commerce

a) E-Commerce – Introduction to Management Information System (MIS), Introduction to ISO 9000 procedures. b) Industrial Safety – Reasons for accidents, prevention of accidents, Promotion of safety mindness.

Term work

Any three case studies on: Purchasing activities, Recruitment, Procedure, MIS, Management of funds, Office communication, Venture capital Funding.

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Industrial Engineering and Management	O. P. Khanna	Dhanpatrai publications Ltd, New Delhi		
2	Industrial Management – I	L.C.Jhamb ,Savitri Jhamb	Everest Publishing House		
3	Global Management Solutions	Dinesh Seth and Subhash C. Rastogi	Cengage Learning, USA	2 nd	
4	Management Information Systems	B. Davis and Margrethe H. Olson	Mc-Graw-Hill International Editions		
5	Strategic Management & Business Policy	AzarKazmi	Tata McGraw Hill, New Delhi		
6	Management Information Systems	Kenneth C. Laudon and Jane P. Laudon	Eighth Edition, Pearson Education		
7	Materials and Logistics Management	K. ShridharaBhat	Himalaya Publishing House, Mumbai		
8	Financial Management	M.Y. Khan and P. K. Jain	Tata McGraw Hill, New Delhi		
9	Project Management	Ravi M. Kishore	Tata McGraw Hill, New Delhi		

Project Work-I

Students are allowed to select the topic of their project work subject to approval of the scope by the faculty. Maximum 4 students can work in group for a common topic. Students are expected to visit the site, shops, etc. They can discuss the topic with manufactures, owners, consultants. The project report comprising drawing, sketches, photographs and description must be elaborate to cover the topic in its entirety. The Drawing should specify sizing and the report should be hand written. The oral examination based on the project work submitted, shall be conducted in the presence of an external examiner.

Internship

Student need to complete his/her Internship for the span of three months from any reputed relevant industry. Student will get internship letter from the college and students need to submit the internship completion certification.

SEMESTER VI

PAPER - XXIV- WELDING AND SALVAGING PROCESSES

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	some knowledge about defetcs
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	03/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Objectives:

1. To learn various types of welding processes.
2. To gain knowledge about selection of appropriate welding process.
3. To understand physical and metallurgical characteristics of weldments.
4. To know the concept of salvaging.

Course Outcomes (COs):

Course Outcomes (COs): Upon completion of this course, students will be able to		Mapping with PO's
CO 1	Demonstrate various welding processes.	1
CO 2	Select appropriate welding process according material specification.	1
CO 3	Salvage different components according to physical and metallurgical characteristics.	1

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	1	-	-	-	-	-	-	-	-	-	-
CO 2	1	-	-	-	-	-	-	-	-	-	-
CO 3	1	-	-	-	-	-	-	-	-	-	-

Course contents:

Various welding processes suited to fabrication and repair of castings and forgings; weldability; welding energy sources and their characteristics; welding of various metals and alloys; Physical and metallurgical characteristics of weldments, testing and inspection of weldments; Salvaging of castings and forging. Types of methods of repairs; impregnation; metal spraying and other processes.

Text Books/Reference Books/ Other Books/E-material/Paper

Sr.No	Title	Author	Publisher	Edition	YearofEdition
1	Metallurgy of Welding	J. L. Lancaster	Woodhead Publishing Ltd.		
2	Metals and their Weldability	Welding HandbookPart-IV	American Welding Society		
3	Metallurgy of Welding	Porter & Stirling			
4	Physical Metallurgy-Vol I and II				
6	Metallurgy for Engineers	Clark and Varney			
7	Welding Technology & Design	V. M. Radhakrishnan	New Age International Publishers		
8	A Textbook of Welding Technology	O. P. Khanna			
9	Principles of Welding	R. W. Messler	John Wiley & Sons		

PAPER –XXV: ENERGY CONSERVATION AND POLLUTION CONTROL

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Different casting processes
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	03/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
EvaluationScheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Objectives:

1. To learn about various energy sources.
2. To generate awareness about energy conservation.
3. To Learn various aspects of pollution in foundries.

Course Outcomes (COs):

Course Outcomes (COs): Upon completion of this course, students will be able to		Mapping with PO's
CO 1	Select appropriate energy source including alternate energy sources.	4,5
CO 2	Apply and create energy conservation techniques.	4,5
CO 3	Design the procedure to control the pollution in foundries.	4,5

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	-	-	-	1	3	-	-	-	-	1	-
CO 2	-	-	-	1	3	-	-	-	-	1	-
CO 3	-	-	-	1	3	-	-	-	-	1	-

Course contents:

Energy Conservation- Forms of energy, energy conservation, energy sources and resources, present and future energy demands; Review of commercial energies from solid, liquid and gaseous fuels. Nuclear energy systems, alternate energy sources; Improving energy efficiency in extractive metallurgical processes; Design and management of energy conservation; Recycling of energy, energy conservation techniques.

Pollution Control- Gas recovery in metal processing industries, gas cleaning and removal of particulate matter from gases; Heat exchangers and water cleaning of solids; Pollution control in specific metal process industries- Iron and steel, Cu, Ni, Pb, Zn, Al etc; Environmental considerations in metal casting, metal forming, metal plating and heat treatment industries

TextBooks/ReferenceBooks/ OtherBooks/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Managing Industrial Pollution	S. C. Bhatia	Macmillan India Ltd.		

2	Environmental Principles and Policies	Sharon Beder			
3	Plant Engineers	Dennis A. Snow	Butterworth Hienemann		
4	Efficient use and Conservation of Energy Vol.1	Clark W. Gellings	Encyclopedia of Life Support Systems		
5	Energy Conservation through Control	Francis Shinsky	Elsevier Inc		
6	Energy Management and Conservation	K. V. Sharma			
7	Energy Conservation Act, 2001- Along with Allied rules		Universal Law Publication		

PAPER –XXVI: FRACTURE MECHANICS AND ANALYSIS OF FAILURE

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Understanding of mechanical properties.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	03/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
EvaluationScheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Objectives:

1. To learn the concepts of fracture mechanics.
2. To understand various types of failure.
3. To learn the failure at different conditions.
4. To give different case studies of failures.

Course Outcomes (COs):

Course Outcomes (COs): Upon completion of this course, students will be able to		Mapping with PO's
CO 1	Apply the concepts of fracture mechanics.	1,3
CO 2	Analyze various types of failure at different condition.	1,3
CO 3	Evaluate different case studies of failures.	1,3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO 1	1	-	1	-	-	-	-	-	-	2	-
CO 2	1	-	1	-	-	-	-	-	-	2	-
CO 3	1	-	1	-	-	-	-	-	-	2	-

Course contents:

Aims of failure analysis, Prime factors in the premature failure of metallic components and structures, Tools and techniques in failure analysis, Types of failures: ductile, brittle, fatigue, creep, corrosion, wear etc., fractography, mixed mode and fatigue failures, Failure mechanisms, Embrittlement phenomena, environmental effects, Failures due to faulty heat treatments, Failures in metal forming and welding, Case studies in failure analysis, Prevention of failures, case histories of component failures.

TextBooks/ReferenceBooks/ OtherBooks/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	YearofEdition
1	Fracture Mechanics-Fundamentals and Applications	T. L. Anderson			
2	Fracture Mechanics	M. Janssen	Taylor and Francis Group		
3	Metal Fatigue Analysis Handbook	Yung Li Lee, Mark Barkey	Butterworth Hienemann Pub		
4	Fatigue of Materials	S. Suresh	Cambridge University		
5	Applied Fracture Mechanics	Alexander Belov	Intech Pub.		
6	Fatigue Failure of Metals	S. Kocanda	Slithoff&Noordhoff International Pub		
7	Smithells Metals Reference Books	W. F. Gale	Elsevier Pub.		

Project Work-II

Students are allowed to select the topic of their project work subject to approval of the scope by the faculty. Maximum 4 students can work in group for a common topic. Students are expected to visit the site, shops, etc. They can discuss the topic with manufactures, owners, consultants. The project report comprising drawing, sketches, photographs and description must be elaborate to cover the topic in its entirety. The Drawing should specify sizing and the report should be

hand written. The oral examination based on the project work submitted, shall be conducted in the presence of an external examiner.

List of Experiments

Semester V

<u>Part-I:CADCAM</u>	
Sr. No	Name of Experiment
1	Prepare 2D model using CAD software
2	Prepare 3D model (use any3D modeling software)
3	Simulate the metal flow (Use casting simulation software)
<u>Part-II:CASTING DEFECTS</u>	
1	Description of defect : Burnt-on sand
2	Description of defect: Cores and edge disintegration
3	Description of defect: Erosion
4	Description of defect: Explosive penetration
5	Description of defect: Lustrous carbon inclusion
6	Description of defect: Graphite degeneration
7	Description of defect: Fissure defect
8	Description of defect: Pitted surface
9	Description of defect: Penetration
10	Description of defect: Surface blow hole
11	Description of defect: Pin hole
12	Description of defect: Sand inclusion
13	Description of defect: Surface roughness
14	Description of defect: Scabbing
15	Description of defect: Swelling
16	Description of defect: Penetration due to chemical reaction

Semester VI

Sr. No	Name of Experiment
1	Salt spray (Fog chamber) test
2	Humidity Resistance test

3	Heat resistance test of paints
4	Portable hardness test
5	Adhesion test of paint
6	Replica method to determine microstructure
7	Crack detection of metal using ultrasonic crack detection machine
8	Crack detection of metal using magnetic particle inspection
9	Surface crack detection using dye penetrant testing

**VIVEKANAND COLLEGE, KOLHAPUR
(AUTONOMOUS COLLEGE)**

Board of Studies in Graphic Design

Choice Based Credit System Pattern

Syllabus

For

B. Voc. Part-III

B.Voc in Graphic Design

(To be implemented from Academic Year 2020-2021 onwards)

VIVEKANAND COLLEGE, KOLHAPUR

(AUTONOMOUS COLLEGE)

2130, E-Ward, Tarabai Park,

KOLHAPUR - 416003

DEPARTMENT OF GRAPHIC DESIGN

Board of Studies

Sr. No	Name of the Faculty	Area of Specialization	Name of the College	Experts	Nomination	Sign
1	Mr. Satish B. Gaikwad	Inorganic Chemistry	Vivekanand College	Nodal Officer, B.Voc & Community College	Chairperson	
3	Mr. S. V. Desai	Designing, Photography and Printing	Vivekanand College	---	Member	
3	Mr. Satish V. Upalavikar	Painting and Designing	Vivekanand College	---	Member	
2	Mr. Rahul Parashram Ingavale	Printing and Designing	Vivekanand College	---	Member	
4	Mr. Dhiraj Nimbalkar	Painting and Designing	Vivekanand College	---	Member	
5	Miss Shradhha Shinde	Painting and Designing	Vivekanand College	---	Member	
6	Mr. Sachin Jamadar	Painting and Designing	Vivekanand College	---	Member	
7	Miss Surabhi Kanchan Gulwelkar	M.F.A.(Portrait) 2017 from Sir J.J.School of Art,Mumbai University, Distinction with 1st rank.	Assistant Professor, D. Y. Patil College of Applied Art, Pune.	Faculty member from other university	Nominated by Academic Council	
8	Mr. Vinaykumar Vasantrao Deshpande	B.F.A. (Applied Art) The Maharaja Sayajirao University,Baroda.	Ex- Faculty of Fine Arts The Maharaja Sayajirao University, Baroda.	Faculty member from other university	Nominated by Academic Council	
9	Mr. Sanjay Shelar	Painting and Designing	Freelance International Artist	---	Nominated by Principal	
10	Mr. Shirish Khandekar	Graphic Design	Nirmiti Graphics, KOLHAPUR.	Industrial Expert	Nominated by Principal	

BACHELOR OF VOCATION (B.Voc.)

STRUCTURE OF SYLLABUS:

To be implemented from the academic year 2020-2021

1. Title of the course: BACHELOR OF VOCATION (Graphic Design)

A. INTRODUCTION

Graphic design is the creative planning and execution of visual communication. One learns to create a combination of shapes and forms, words and images, in order to reproduce them in some flat medium (two dimensional - paper, cardboard, cloth, plastic, video, computer, or projection screen, on poster, billboard, or other signage) or in a three-dimensional form (fabricated or manufactured) in order to convey information to a targeted audience. All graphic design has a purpose or function. Usually its purpose is commercial to explain aesthetically something -- to express, inform, and influence the thoughts and actions of its audience.

This subject introduces the student to art intended to communicate information and advertising. The focus is on studying and using layout and design concepts used in the graphic design field. The students will employ both analog media (drawing with pencil and paper, etc.) and digital media -- using up-to-date computer tools (graphics hardware and software - for drawing, painting, layout, typography, scanning, editing and photography).

1.Creating Art: Students know and apply the arts, disciplines, techniques and processes to communicate in original or interpretive work.

2.Art in Context: Students demonstrate how elements of time and place influence the visual characteristics, content, purpose and message of works of art.

3.Art as Inquiry: Students demonstrate how the arts reveal universal concepts and themes. Students reflect upon and assess the characteristics and merits of their work and the work of others.

B. RATIONALE

Design is the process of selection where visual elements such as point, line, shape, volume, tone, texture, color, form, format, space, and structure are used by students to express their ideas. Visual sensitivity and working knowledge of design elements would be developed by solving a series of problems and employing a variety of media and materials. The curricular area aims at enabling the students to develop their mental faculties of observation, imagination, and creation and develop skills and sensitivity towards the use of visual elements for an effective visual communication.

Design is an activity of problem solving for the well being of society and individuals. Today, in the world of information and communication every one has to communicate and get

communicated by different groups of people through a wide variety of communication systems.

Graphic designs course have great potential in providing creative solutions to communication of complex phenomena of print media such as books, magazines and newspaper, known as pictographic depictions or concept visualization. It can be traditionally applied in typography, cartooning (social, political and educational), and designing poster, book-covers, letter heads, news papers, brochure, logo, textile prints, or even jewelries. Since the advent of personal computers and design software, graphic design is being utilized in electronic media-often referred to as interactive design which has unlimited applications in advertisements. The students can later become graphic designers working in print production (newsletters, posters, brochures, etc). Graphic designers combine text and images to communicate a message: sell a product or service, inform, or entertain.

The Graphic Design curriculum focuses on creating intelligent and powerful visual communication. Students build a strong foundation for a graphic design career by learning design techniques, visual thinking, concept development, colour, composition, and typography, through case studies and hands-on exercises. During the study, assignments will incorporate problem solving projects that relate to visual communication. The course includes introduction to computer as a tool to create, modify and present the visual messages.

C.CORE CONTENT GOALS FOR GRAPHIC DESIGN

The students will learn:

- The history of graphic design.
- What a layout is and how to create an effective one.
- About lettering/fonts and their implications.
- What a logo is and how to create one.
- The basics of two dimensional design including the elements and principles of art.
- About color theory and its implications in Graphic Design.
- How to use art criticism effectively.
- About Graphic Design as a career.
- To improve their design skills and techniques using a variety of tools.
- To learn pre and post production techniques.

In this class, students will design and create a variety of projects, both by hand and by using computer graphic design programs. They will maintain good studio organization and use of tools as expected by the teacher. They are expected to maintain facilities in an appropriate working condition.

2. Duration:

The duration of the B.Voc. Course will be of **three years**.

- **B.Voc. Part I - Diploma in Graphic Design**
- **B.Voc. Part II - Advanced Diploma in Graphic Design**
- **B.Voc. Part III - Bachelor of Vocation in Graphic Design**

The final B.Voc degree will be awarded only after completion of three year course. The suggested credits for each of the years are as follows:

Awards	Normal calendar duration	Skill Component Credits	General Education Credits
Year 1 Diploma in Graphic Design	Two Semesters	36	24
Year 2 Advanced Diploma in Graphic Design	Four Semesters	36	24
Year 3 B.Voc in Graphic Design	Six Semesters	36	24
TOTAL		108	72

General Education Component should not exceed 40% of the total curriculum.

Credits can be defined as the workload of a student in

1. Lectures
2. Practical
3. Seminars
4. Private work in the Library/home
5. Examination
6. Other assessment activities.

The following formula should be used for conversion of time into credit hours.

- a) One Credit would mean equivalent of 15 periods of 60 minutes each, for theory, workshops /labs and tutorials;
- b) For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops;
- c) For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

3.Eligibility:

The eligibility condition for admission to B.Voc. programme shall be 10+2 or equivalent, in any stream from any recognized board or university.

The candidates having Art Teachers Diploma (ATD) of Directorate of Art, Maharashtra Government, Mumbai **after XII** are eligible for admission to B.Voc. part II advanced diploma programme.

4. Medium of Instruction:

The medium of instruction of the course will be **Marathi / English**

5. Pattern: Semester Pattern.

6. Examination:

A. Scheme of examination:

- The semester examination will be conducted at the end of each term (both theory and practical examination)
- Theory paper will be of 50 marks each. The practical examination will be of 200 marks and industrial practical training/project work is of 50 marks.
- Question papers will be set in the view of the entire syllabus and preferably covering each unit of the syllabus.

For each semester there will be four theory papers. Practical Examination will be conducted at the end of every semester.

Paper Number	Title of Paper (For Semester V)	Internal Marks	Theory Exam Marks	Total Marks
I	Advertising Art (Part - III)	10	40	50
II	Logo Designing	10	40	50
III	Photography	10	40	50
IV	Brands and Branding	10	40	50
TOTAL		40	160	200

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	180	Projects/ Industry Visit	50
2	Portfolio	20		
Total		200		50

The total weightage of first term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 50 X 4	200
2	Practical Examination.	200
3	Internal Assessment	50
TOTAL		450

B. Nature of question paper:

For each paper there will be **THREE** compulsory questions.
General nature and marking system of the question paper will be:

Question Number	Type		Marks
Q.1	MCQ	No internal options	8
Q.2	Long answer	Any two out of three	16
Q.3	Short notes	Any four out of six	16

C. Standard of Passing:

To pass the examination a candidate must obtain at least 35% (i.e. 14 marks out of 40) in individual subjects, in internal assessment and University examination each in all theory and practical subjects.

D. External Students: Not applicable as this is a practical oriented course.

7. University Term: As per academic calendar of the university.

For the first year i.e. Diploma in Graphic Design practical examination and theory paper assessment will be done at college level.

8. List of equipment and instruments:

1. Computer Machines
2. Colour Printer
3. Scanner
4. Digital Camera
5. Projector
6. Internet Connectivity
7. CCTV Camera for Graphic Design Laboratory is must.

9. Laboratory Safety Equipments:

Part I: Personal Precautions:

1. Must wear **Lab Aprons / Lab Jacket** and proper shoes.
2. Except in emergency, over – hurried activities is forbidden.
3. Eating, Drinking and Smoking in the laboratories is strictly forbidden.

Part II: Use of Safety and Emergency Equipments:

1. First aid Kits
2. Fire extinguishers (dry chemical and carbon dioxide extinguishers)
3. Management of Local exhaust systems.
4. Sign in register if using instruments.

10. Workload:

Each skill based paper (i.e. Paper no. II, III and IV) will have **four theory** periods per week. There are **four practical** per week. Each practical will be of four periods. The practical batch will have maximum 20 students.

The total workload for one batch will be:

1. Four Papers on skill based Education: 4 X 4	=	16 Theory Periods.
2. Four Practical work per week: 4 X 4	=	16 Practical periods.
3. Project Work per batch per week:	=	04 Periods

TOTAL		36 Periods.

Working hours will be 5 hours (300 minutes) per day i.e. six periods each of 50 minutes.

13.MEMORANDUM OF UNDERSTANDING (MOU):

The purpose of this MOU is to clearly identify the roles and responsibilities of each party (i.e. college and industry partner) as they relate to the implementation of the **B.Voc. Programme in Graphic Design** at the college.

It is recommended to sign at least **TWO MOU** with the industry partners in the related field.

14. PROGRAM OUTCOMES (POs)

1. B. Voc. Graduate in Graphic Design will learn and understand the principles of Drawing, Sketching, Design, Color Theory and Typography.
2. Graduate will learn and understand tools and techniques of creating designs and layouts for the print media AND creating digital Illustrations.
3. Graduate will learn and understand tools and techniques of creating digital image manipulations.
4. B. Voc. Graduate in Graphic Design will able to develop an original, innovative and articulate body of graphic design work for a professional portfolio.
5. B. Voc. Graduate in Graphic Design will able to develop and provide design solutions in response to a given brief.
6. B. Voc. Graduate in Graphic Design will develop demonstrated ability to evaluate the requirements for packaging in response to a brief.
7. B. Voc. Graduate in Graphic Design will able to present a range of promotional material, using branding guidelines, in support of a given brand.
8. B. Voc. Graduates in Graphic Design will gain knowledge of the professional design environment and awareness of the designer's roles and responsibilities, client liaison, and how to present themselves and their work within a commercial environment.

15. PROGRAM EDUCATIONAL OUTCOMES :

1. The graduates will apply knowledge gained in course to improve lives and livelihoods through a successful career in Graphic Design field.
2. The Graduates will engage in lifelong learning such as higher studies & association with professional bodies.

16. PROGRAM SPECIFIC OUTCOMES :

1. B. Voc. Graduates in Graphic Design will work on various platforms by using their knowledge and creativity in data sorting, research, mind mapping, thinking process behind concept and problem solving presentation of final design.
2. B. Voc. Graduates in Graphic Design will use latest trends, 3d printing concepts, advance techniques of printing and presentation in print and digital media for high quality solution.

B.Voc. Part - III Course structure

General Structure:

The degree course has two semesters, each of 450 marks. There will be **four theory** papers for each semester of 50 marks each.

- 1) Paper-I: Advertising Art (Part - III) - 50 Marks.
- 2) Paper-II: Logo Designing - 50 Marks.
- 3) Paper-III: Photography - 50 Marks.
- 3) Paper-IV: Brands and Branding - 50 Marks.

There will be practical examination for each semester. The duration of practical examination will be of six hours and it will be of 100 marks of which 20 marks are reserved for Portfolio, Industry Training via internships, handling live Projects. The internal assessment includes visits to Advertising Agency and Graphic Design Studios, home assignment, test & tutorials etc.

SYLLABUS

B.Voc IN GRAPHIC DESIGN

SEMESTER V

SKILL BASED PAPERS:

Paper I: Advertising Art (Part III)

Name of Course Teacher:	Mr. Satish Vinayak Upalavikar
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic concepts of Projection methods & appropriate knowledge of types of lines.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107. 1	Understand Creative Advertising.- Planning and Execution — Ideas - Soul of Advertising— Unique Selling (Propositions) — Points of a Product	3
CF107.2	Understand and Study How Product Analyses are made. Applications of USPs— Basic Human Motives that make People Act— Desire and Hope— Basic Human Desires that relate to Advertised Products— Humor— Sympathy — Empathy — Anxiety — Fear— Executing The Theme Creatively	4
CF107.3	Understand What is Copy Platform?—Copywriting Functions of Advertising Copy—Basic Ingredients of Copy—Approach to Writing Copy—'The Headline—Text Copy—Visualization— Invention of Advertising Ideas— Advertising must be such that it is capable of easy perception— Advertising must be interesting— Advertising must use the best presentation techniques— What is 'Graphic' in advertising design	8
CF107.4	Study Principles of Design: The Law of Balance—The Law of Rhythm—The Law of Emphasis—The Law of Unity—The Law of Simplicity—The Law of Proportion	2

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107. 1	-	-	2	-	-	-	-	-	-	-	-
CF107.2	-	-	-	2	-	-	-	-	-	-	-
CF107.3	-	-	-	-	-	-	-	3	-	-	-
CF107.4	-	3	-	-	-	-	-	-	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	"Advertising Art and Idea",	Dr. G. M. Rege	Ashutosh Prakashan	1987	-
2	"Indian Advertising Laughter and tears",	Arun Chaudhuri	Niyogi Books	2014	-
3	"Advertising and IMC Principles and Practice",	Sandra Moriarty Nancy D. Michal William D. Wells	Pearson Education India	10th	2016
4	"Advertising Promotion and Marketing Communication"	Kermeth Clow Donald Baack	Pearson Education India	6th	2013
5	"Advertising Management",	Jaishri Jethwaney Shruti Jain	Oxford University Press India	2nd	2013

Paper –II: Logo Designing

Name of Course Teacher:	Mr. S. V. Desai
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic concepts of Projection methods & appropriate knowledge of types of lines.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107. 1	Understand importance of Preliminary sketches, first step in designing an effective logo. These can be as simple as paper and pen drawings or drafts made using a vector program, such as Illustrator. Start with 20 to 30 sketches or ideas and then branch out to create variations of the original ideas. If nothing seems to work, start over and begin sketching new ideas. An effective graphic designer will spend more time on this preliminary work than any other step in the design process.	5
CF107.2	How to keep your logo balanced by keeping the —weight of the graphics, colors, and size equal on each side. Though the rule of balance can occasionally be broken, remember that your logo will be viewed by the masses, not just those with an eye for great art, so a balanced design is the safest approach.	1
CF107.3	Understand how color theory is complex, but designers who understand the basics are able to use color to their advantage. Use colors near to each other on the color wheel (e.g. for a —warm palette, use red, orange, and yellow hues). Don't use colors that are so bright that they are hard on the eyes. The logo must also look good in black and white, grayscale, and two colors. Breaking the rules sometimes is okay; just make sure you have a good reason to!	1
CF107.4	Create various design styles of a logo, and to pick the right one, you should have some background information about the client and the brand. A recent trend in logo design is the Web 2.0 style of 3D-looking logos, with —bubbly graphics, gradients, and drop shadows. This style may work well for a Web 2.0 website or tech company, but may not be effective for other kinds of brands.	8

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	-	-	-	-	2	-	-	-	-	-	-
CF107.2	3	-	-	-	-	-	-	-	-	-	-
CF107.3	3	-	-	-	-	-	-	-	-	-	-
CF107.4	-	-	-	-	-	-	-	2	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	“Logo Modernism (Design)”,	Jens Muller,R.Roger	Taschen Gmbh	2015	-
2	“Logo Design Love”,	David Airey	Peachipit Press	2014	-
3	”Symbol (mini),	Steven Bateman, Angus Hyland		2017	-
4	"Designing Brand identity"	Alina Wheeler		2017	-
5	“Logoism”,	Sandu Publishing	Gingko Press	2017	-

Paper –III : Photography

Name of Course Teacher:	Mr. Raghu Jadhav
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic concepts of Projection methods & appropriate knowledge of types of lines.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107. 1	Understand Short History 1. Precursor technologies, 2. Invention of photography, 3. Film photography, 4. Digital Photography	3
CF107.2	Understand and Study Camera controls - Focus, Aperture, Shutter Speed, White Balance, Film Speed, Metering, Autofocus	3
CF107.3	Study Type of lenses - Normal, Long focus, Wide angle, Telephoto, Macro, Fisheye, Zoom	3
CF107.4	Study Photographic Techniques & accessories - Depth of field, using camera filters, tripod	4

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107. 1	-	-	1	-	-	-	-	-	-	-	-
CF107.2	-	-	2	-	-	-	-	-	-	-	-
CF107.3	-	-	1	-	-	-	-	-	-	-	-
CF107.4	-	-	-	1	-	-	-	-	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	"Understanding Colors",	Bryan Peterson	Random Houreus	2018	-
2	"The Art of Photography",	Bruce Barnbaum	Rocky Nook	-2017	-
3	"Luerniing to see Creativity",	Bryan Peterson	Amphoto Books	2015	-
4	"Light Scms & Magic"	Fil Hunter	Routledge	2015	-
5	"Fast track Photographer Businessplan",	Dane Sanders	Amphoto Books	2010	-

Paper IV: Brands and Branding

Name of Course Teacher:	Mr. Dhiraj Anil Nimbalkar
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic concepts of Projection methods & appropriate knowledge of types of lines.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107. 1	To understand Meaning of Brand and Branding - Brand is a term closely linked to a product or place's image and reputation in that it —captures the idea of reputation observed, reputation valued and reputation managed At its simplest, a brand is —a product or service or organisation, considered in combination with its name, its identity and its reputation	5
CF107.2	To understand & study Brands: Not just about Promotion, but about Trust and Respect Importantly, brands represent more than a set of images to promote a product or place; they are about trust and respect (Bell, 2005). The meanings, symbols, and values represented by brands —not only reinforce the identity and uniqueness of destinations but also reassure the people, habitués, values, and symbols of their own culture, thus preserving the..._state of being' of the placell	7
CF107.3	To Build a Brand Branding is a way of defining your business to yourself, your team and your external audiences. It could be called the business' —identity , but only on the understanding that it embodies the core of what the business is and its values, not just what it looks and sounds like.	8

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107. 1	-	-	-	-	2	-	-	-	-	-	-
CF107.2	-	-	-	-	-	-	1	-	-	-	-
CF107.3	-	-	-	-	-	-	-	3	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	“Brands & Branding”,	Rita Clifton ,	Profile Books Ltd.	2014	-
2	“How To Lounch A Brand”,	Fabian Geyrtatter	Brandtro	2016	-
3	"Personal Branding”,	Matt Golden	Bravex Publication	2016	-
4	Brand The Change	Anne Mitenburg	Bis Publishers	2018	-

Practical

A) Software Skill Development

1) Adobe Illustrator - Basic

40 Hrs.

3) Photoshop

20 Hrs

Action making, create mockups and use plugins.

60 Hrs

B) Design Skill Development

Advertisement

- Advertising Campaign
- Branding
- Out Door - Hoardings
- POP

140 Hrs.

Logo Design Development

- Research
- Brain Storming
- Sketching
- Execution
- Artwork

C) Project Work 50 Hrs.

1) Creating Design Portfolio on designers community sites

(Behance Network, DeviantArt , DesignersCouch, DesignRelated etc.)

2) Advertising Agency Visit

3) Collect best designer’s portfolios

SEMESTER VI

A. Nature of Examination:

For second semester there will be four theory papers. Practical Examination will be conducted at the end of the semester.

Paper Number	Title of Paper (For Semester VI)	Internal Marks	Theory Exam Marks	Total Marks
V	Symbol and Icon Design	10	40	50
VI	Visual Communication and Information Graphics	10	40	50
VII	Public Signage Graphics	10	40	50
VIII	UI/UX Design	10	40	50
TOTAL		40	160	200

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	180	Projects/ Industry Visit	50
2	Portfolio	20		
Total		200		50

The total weightage of second term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 50 X 4	200
2	Practical Examination.	200
3	Internal Assessment	50
	TOTAL	450

B. Nature of question paper:

General nature of the question paper will be:

Question Number	Type		Marks
Q.1	MCQ	No internal options	8
Q.2	Long answer	Any two out of three	16
Q.3	Short notes	Any four out of six	16

SEMESTER VI

SKILL BASED PAPERS :

Paper –V : Symbol and Icon Design

Name of Course Teacher:	Miss Shraddha Vijay Shinde
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic concepts of Projection methods & appropriate knowledge of types of lines.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107. 1	An understanding of symbolism is a critical part of graphic design. Designers use symbols in both obvious and subtle ways to communicate something about the design. Symbolism is a profound, complex subject so in this post I will present an overview of what I consider to be the most important for designers to be aware of in terms of symbolism.	1
CF107.2	Understand and Study SYMBOLISM OF COLOR: USING COLOR FOR MEANING Color Symbolism in the Western world: Color Symbolism in the Eastern World:	1
CF107.3	Understand ICON DESIGN - Icon design is the process of designing a graphic symbol that represents some real, fantasy or abstract motive, entity or action. In the context of software applications, an icon often represents a program, a function, data or a collection of data on a omputer system.	5
CF107.4	Study Brand icons for commercial - A further type of computer icon is the brand icon of commercial third-party software programs available on the computer system. These brand icons are bundled with their product and installed on a system with the software.	8

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107. 1	2	-	-	-	-	-	-	-	-	-	-
CF107.2	3	-	-	-	-	-	-	-	-	-	-
CF107.3	-	-	-	-	2	-	-	-	-	1	1
CF107.4	-	-	-	-	-	-	-	1	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	“How to Design Logos, Symbols & Icons”,	Gegory Thomos	Adoms Media	2003	-
2	“Thinking in Icons”,	Felix Sockwell	Rockport Publishers	2017	-
3	"The Icon Book”,	William Horton	Wiley	2019	-
4	"Symbol"	Steven Bateman, Angus hyland	Laurence King Publishing	2011	-

Paper –VI: Visual Communication and Information Graphics

Name of Course Teacher:	Mr. Satish Vinayak Upalavikar
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic concepts of Projection methods & appropriate knowledge of types of lines.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107. 1	To understand & study THE COMMUNICATION DESIGN Industries are changing rapidly For our graduates to remain valid contributors to contemporary communication industries they must be able to understand the multitude of communication platforms they will encounter, from the traditions of print, to online and tablet devices; environmental graphics to the sound and motion of film.	3
CF107.2	To understand RELATIONS BETWEEN DATA VISUALIZATION AND INFOGRAPHICS The purpose of data visualization and infographics is to provide visual presentation of complex and irregular information in a planned and comprehensible manner. Both terms have different meanings despite this joint purpose.	5
CF107.3	To understand TECHNOLOGICAL INFRASTRUCTURE OF DATA VISUALIZATION AND INFOGRAPHIC WORKS Inclusion of interactive or motion formats to the study calendar into the infographics and data visualization projects together with static formats will develop students' skills to use technology	5

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CF107.1	-	-	1	-	-	-	-	-	-	-
CF107.2	-	-	-	-	1	-	-	-	-	-
CF107.3	-	-	-	-	2	-	-	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr.No	Title	Author	Publisher	Edition	Year of Edition
1	“Visual Communication Images with Messages”.	Poul Martin Lester	-	-	-
2	“Visual Communication”.	Jonathan Baldwin Lucienne Roberts	Ava Publishing	2006	-
3	"Visual Meetings”.	David Sibbet	-	-	-
4	Design for Information	Isabel Meirelles	-	-	-
5	The Doodle Revolution	Sunni Brown	Adoms Media	-	-

Paper –VII: Public Signage Graphics

Name of Course Teacher:	Mr. Dhiraj Anil Nimbalkar
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic concepts of Projection methods & appropriate knowledge of types of lines.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	To understand Signage - Signage is the design or use of signs and symbols to communicate a message to a specific group, usually for the purpose of marketing or a kind of advocacy. A signage also means signs collectively or being considered as a group. The term signage is documented to have been popularized in 1975 to 1980.	5
CF107.2	To understand and learn HISTORY The French ensign indicates its essential connection with what is known in English as a flag, and in France, banners not infrequently took the place of signs or sign boards in the Middle Ages. Signs, however, are best known in the form of painted or carved advertisements for shops, inns, etc.	2
CF107.3	To understand & study types of signage – Pictograms Pictograms are images commonly used to convey the message of a sign. In statutory signage, pictograms follow specific sets of colour, shape and sizing rules based on the laws of the country in which the signage is being displayed.	5
CF107.4	To study and process on SIGN SHAPE - The shape of a sign can help to convey its message. Shape can be brand- or design-based, or can be part of a set of signage conventions used to standardize sign meaning. Usage of particular shapes may vary by country and culture.	7

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	-	-	-	-	2	-	-	-	-	-	-
CF107.2	-	1	-	-	-	-	-	-	-	-	-
CF107.3	-	-	-	-	1	-	-	-	-	-	-
CF107.4	-	-	-	-	-	-	2	-	-	-	-

Text Books/Reference Books/Other Books/E-material/Paper

Sr.No	Title	Author	Publisher	Edition	Year of Edition
1	"New Signage Design",	Wong Shiaoqiang	Promo Press	2018	-
2	"Digital Sigage",	Keith Kelsen	Routledge	2015	-
3	"Signage Design for Public Space",	Jemes Trulove	Rock Port Publishers Inc.	2000	-

Paper –VIII: UI/UX Design

Name of Course Teacher:	Mr. S. V. Desai
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic concepts of Projection methods & appropriate knowledge of types of lines.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107. 1	To understand User Interface Design - Designing effective interfaces for software systems	2
CF107.2	To understand and learn IMPORTANCE OF USER INTERFACE System users often judge a system by its interface rather than its functionality. A poorly designed interface can cause a user to make catastrophic errors . Poor user interface design is the reason why so many software systems are never used.	4
CF107.3	To understand & study GRAPHICAL USER INTERFACES Most users of business systems interact with these systems through graphical user interfaces (GUIs) – although, in some cases, legacy text based interfaces are still used.	3
CF107.4	To create GUI CHARACTERISTICS <ul style="list-style-type: none"> • Windows • Icons • Menus • Pointing Devices • Graphics 	8

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107. 1	-	1	-	-	-	-	-	-	-	-	-
CF107.2	-	-	-	2	-	-	-	-	-	-	-
CF107.3	-	-	1	-	-	-	-	-	-	-	-
CF107.4	-	-	-	-	-	-	-	3	-	-	-

Text Books/Reference Books/Other Books/E-material/Paper

Sr.No	Title	Author	Publisher	Edition	Year of Edition
1	“UI UX Design”,	Xia Jiajia	Art Power International	2016	-
2	“UX for Dummies ”,	Donald Chesnut	Wiley	2014	-
3	"Lean UX ”,	Jeff Gothelf	Shroff	2016	-
4	UI is Communication	Everett N McKey	Moegan Kaufmann	2013	-

B. Practicals:**A. Software Skill Development****1) Illustrator Advance****50 hrs****B. Designing Skill Development****200 hrs****1) Advertising Designing****2) Poster****3) Social Media Advertising****4) Portfolio Making****C. Company Project Work****50 hrs****1) Create Logo****2) Design Corporate Identity****3) Design advertising campaign****4) Design web page****5) Social Media advertising**

**VIVEKANAND COLLEGE,
KOLHAPUR.
(AUTONOMOUS)**



**ANIMATION
& FILM MAKING**

Syllabus

For

B. Voc Part - III

Bachelor of Vocation in Animation & Film Making

To be implemented from Academic Year 2020-2021 onwards

STRUCTURE OF SYLLABUS:

To be implemented from the academic year 2020-2021

1. Title of the course: BACHELOR OF VOCATION (Animation & Film Making)

A. INTRODUCTION

B. RATIONALE

C. COURSE OBJECTIVES

By studying animation & film making students will have a wider horizon in the field of art and will

- Students will complete an extensive body of amateur work as writer/directors.
- In addition to training as writer/directors, students will become proficient in other production and postproduction skills (camera, lighting sound, editing) and have the ability to enter careers in the entertainment industry, broadcasting, journalism, art, advertising, and arts management.
- Students will be able to apply theoretical, critical, and historical concepts when making style choices in their own projects and in referencing or analyzing the medium of cinema.
- Students will learn the rudiments of narrative filmmaking in the short form and be able to apply these skills to long-form work.
- Students will learn the fundamentals of documentary filmmaking and forms-direct cinema, cinema verite, re-enactment, the documentary essay, the place film, diary forms- and the documentary of systems and abstract processes-finance, globalization, and the environment. Young people have a healthy sense of outrage; they are inspired by the greater good.
- Students will engage in the use and analysis of emerging technologies.
- Students will be able to research, gather, and synthesize information.
- Students will demonstrate the ability to depart from traditional or comfortable ways of thinking, to explore, to wander, to get lost, to journey down unfamiliar channels and emerge with renewed perceptions in order to innovate and add to cinematic practice.

THE STUDENTS WILL LEARN:

- Students will demonstrate that they understand the pre-production, production, and postproduction filmmaking process
- Students will demonstrate the relationship between film form and aesthetic effect through both film analysis and the creation of motion pictures.
- Students will be able to conduct film research and compose cogent, persuasive, and valid essays about film.
- Students will demonstrate a broad knowledge of film history, national cinemas and models of production.
- Recognize and evaluate critical and aesthetic issues within computer graphics and the mixed media. (Issues)
- Apply aesthetic judgments and critical thinking skills to art and graphics related issue. (Aesthetics)
- Demonstrate mastery of specific technical, conceptual and critical abilities within computer graphics and the mixed media. (Abilities)
- Demonstrate proficiency with industrial applications to visual communication related technologies. (Proficiency)
- Communicate effectively in written format on research and creative issues. (Written)
- Communicate effectively in oral format on research and creative issues. (Oral)

- Apply critical thinking and aesthetic judgments in critiquing mixed media and computer graphics productions. (Critiquing)
- Function on multi-disciplinary teams. (Teams)
- Work collaboratively and individually with an understanding of the production process utilized in industry-standard studios. (Process)
- Demonstrate professionalism through creative and intellectual independence. (Professionalism)

2. Duration:

The duration of the B.Voc. Course will be of **three years**.

- **B.Voc. Part I - Diploma in Animation & Film Making**
- **B.Voc. Part II - Advanced Diploma in Animation & Film Making**
- **B.Voc. Part III - Bachelor of Vocation in Animation & Film Making**

The final B.Voc degree will be awarded only after completion of three year course. The suggested credits for each of the years are as follows:

Year	Awards	Normal calendar duration	Skill Component Credits	General Education Credits
1	Diploma in Animation & Film Making	Two Semesters	36	24
2	Advanced Diploma in Animation & Film Making	Four Semesters	36	24
3	B.Voc in Animation & Film Making	Six Semesters	36	24
			TOTAL	108

General Education Component should not exceed 40% of the total curriculum. Credits can be defined as the workload of a student in

1. Lectures
2. Practical
3. Seminars
4. Private work in the Library/home
5. Examination
6. Other assessment activities.

The following formula should be used for conversion of time into credit hours.

- a) One Credit would mean equivalent of 15 periods of 60 minutes each, for theory, workshops /labs and tutorials;
- b) For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops;

c) For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

3. Eligibility:

The eligibility condition for admission to B.Voc. program shall be 10+2 or equivalent, in any stream from any recognized board or university.

4. Medium of Instruction:

The medium of instruction of the course will be **Marathi / English**

5. Pattern: Choice based Credit System (CBCS) Semester Pattern.

6. Examination:

A. Scheme of examination:

- The semester examination will be conducted at the end of each term (both theory and practical examination)
- Theory paper will be of 50 marks each. The practical examination will be of 200 marks and industrial practical training/project work is of 50 marks.
- Question papers will be set in the view of the entire syllabus and preferably covering each unit of the syllabus.

For each semester there will be three theory papers. Practical Examination will be conducted at the end of every semester.

Paper Number	Title of Paper (For Semester -V)	Total Marks
I	Advance VFX	40+10 = 50
II	Sound Techniques	40+10 = 50
III	Film Planning	40 +10 = 50
	TOTAL	150

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	180	Projects/ Industry Visit	50
2	Portfolio	20		
	Total	200		50

The total weightage of first term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 50 X 4	150
2	Practical Examination.	200
3	Internal Assessment	100
	TOTAL	450

B. Nature of question paper:

For the **papers II, III and IV** there will be in all **SEVEN** questions in each paper of which any **FIVE** should be solved. All questions will carry equal marks i.e. each question will be of 10 marks.

General nature of the question paper will be:

Question Number	Type	
Q.1	Short answer	Any two out of three
Q.2,3,4,5,6	Long answer	No internal options.
Q.7	Short notes	Any two out of three

C. Standard of Passing:

To pass the examination a candidate must obtain at least 35% i.e 14 marks out of 40 for theory examination and 4 marks out of 10 in internal assessment of each paper. Total minimum 14 marks out of 50 for each paper should be obtained.

For practical examination minimum 50% marks should be obtained.

The result will be declared on the basis of theory and practical examination for each semester during the course.

D. External Students: Not applicable as this is a practical oriented course.

7. University Term: As per academic calendar of the university.

For the third year i.e. B. Voca in Animation & Film Making practical examination and theory paper assessment will be done at college level.

8. List of equipment and instruments:

1. Computer Machines
2. Colour Printer
3. Scanner
4. Digital Camera
5. Projector
6. Internet Connectivity
7. CCTV Camera for Animation Laboratory is must.

9. Laboratory Safety Equipments:

Part I: Personal Precautions:

1. Must wear **Lab Aprons / Lab Jacket** and proper shoes.
2. Except in emergency, **over-hurried activities** are forbidden.
3. **Eating, Drinking and Smoking** in the laboratories is strictly forbidden.
4. **Mobile phones, external hard drives, pen drives are not allowed.**

Part II: Use of Safety and Emergency Equipments:

1. First aid Kits
2. Fire extinguishers (dry chemical and carbon dioxide extinguishers)
3. Management of Local exhaust systems.
4. Sign in register if using instruments.

10. Workload:

Each skill based paper (i.e. Paper no. I, II and III) will have **three theory** periods per week. There are **five practical** per week. Each practical will be of four periods. The practical batch will have maximum 20 students.

The total workload for one batch will be:

1. Three Papers on skill based Education: 3 X 4	=	12 Theory Periods.
2. Five Practical work per week: 5 X 4	=	20 Practical periods.
3. Project Work per batch per week:	=	04 Periods

	TOTAL	36 Periods.

Working hours will be 5 hours (300 minutes) per day i.e. six periods each of 50 minutes.

11. MEMORANDUM OF UNDERSTANDING (MOU):

The purpose of this MOU is to clearly identify the roles and responsibilities of each party (i.e. college and industry partner) as they relate to the implementation of the **B.Voc. Programme in Animation & Film Making** at the college.

It is recommended to sign at least **TWO MOUs** with the industry partners in the related field.

12. Program Outcomes (POs)

1. B. Voc. Graduates in Animation & Film making will demonstrate that the critical studies of cinema inform their filmmaking and that the study and practice of film production enhance their work as film scholars analysts.
2. B. Voc. Graduates in Animation & Film making will Computer Animation and Game Development graduates will have an understanding of critical and aesthetic issues in computer graphics and mixed-media.
3. B. Voc. Graduates in Animation & Film making will access industry related learning resources.
4. B. Voc. Graduates in Animation & film making will create effective visual animations using the elements of story.
5. B. Voc. Graduates in Animation & film making will identify and apply the 12 principles of animation. List of films featuring clay animation
6. B. Voc. Graduates in Animation & Film making will relate some knowledge of the history of animation.
7. B. Voc. Graduates in Animation & film making will demonstrate entry-level workplace computer competencies using industry standard 2D & 3D animation software.
8. B. Voc. Graduates in Animation & film making will demonstrate industry professional standards within their attitudes, conduct, ethics and work.
9. B. Voc. Graduates in Animation & film making will design layouts and backgrounds that incorporate principles of composition, perspective and color, with speed accuracy and dexterity, using a variety of media.

Program Educational Outcomes:

1. The graduates will demonstrate that they understand the pre- production , production and post production filmmaking process.
2. The Graduates will produce a finished digital interactive portfolio visually demonstrating, animation storytelling, and technical skills.

Program Specific Outcomes:

1. B. Voc. Graduates in Animation & film making will demonstrate mastery of specific technical, conceptual and critical abilities within computer graphics and the mixed media.
2. B. Voc. Graduates in Animation & film making will create 2D and 3D characters and environments that reflect the integration of graphic clarity, design principles, performance principles and theoretical constructs.

SEMESTER – V**Paper : I****Advance VFX**

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Introduction pre- production , production and post production
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	02/02/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	--/--/--/--

Course Outcomes(COs):	Mapping with PO's
Up on completion of this course, students will be able to	
CO107.1 Design visual effects sequences using storyboarding and pre-visualization that meet production requirements.	4
CO107.2 Manage the production of visual effects projects to meet production schedules.	1
CO107.3 Action elements using compositing techniques.	4
CO107.4 Identify hardware and software protocols specific to the field of visual effects.	2
CO107.5 provide students with the opportunity to contribute these core skills to create a VFX shot or sequence.	7
CO107.6 demonstrate their competency with the use of the core VFX production techniques: matte painting, rot scoping, motion capture, match moving	1

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO107.1	-	-	-	2	-	-	-	-	-	2	1
CO107.2	2	-	-	-	-	-	-	-	-	3	1
CO107.3	-	-	-	1	-	-	-	-	-	2	1
CO107.4	-	2	-	-	-	-	-	-	-	2	1
CO107.5	-	-	-	-	-	-	2	-	-	2	1
CO107.6	2	-	-	-	-	-	-	-	-	1	2

Visual effects (abbreviated **VFX**) is the process by which imagery is created or manipulated outside the context of a live action shot in film making.

Visual effects involve the integration of live-action footage (special effects) and generated imagery (digital effects and/or optical effects) to create environments which look realistic, but would be dangerous, expensive, impractical, time consuming or impossible to capture on film. Visual effects using computer-generated imagery (CGI) have recently become accessible to the independent filmmaker with the introduction of affordable and easy-to-use animation and compositing software.

Contents

- 1 Timing
- 2 Categories
- 3 Types
- 4 See also
- 5 Further reading
- 6 External links

Textbooks/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	The Visual Effects Producer	Susan Zwern an, Charles Finance	-	-	-
2	Digital Compositing for Film and Video	Steve Wright	-	-	-
3	The Green Screen Handbook	Jeff Foster	-	-	-
4	Compositing Visual Effects	Steve Wright	-	-	-

Paper –II:**Sound Techniques**

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Theoretical concepts and principles
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	02/02/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	--/--/--/--

Course Outcomes (COs):

Course Outcomes(COs): Up on completion of this course, students will be able to		Mapping with PO's
CO107.1	Demonstrate knowledge of the history of sound-recording technology	6
CO107.2	Understand and define key theoretical concepts and principles pertaining to audio and music recording and production;	1
CO107.3	Explain the sonic characteristics of music using correct technical terminologies;	9
CO107.4	Organize musicians, equipment and venue(s) for a music recording and production project to correct procedures;	3
CO107.5	Execute a group recording project applying theoretical concepts and principles; and Plan, document and evaluate a group recording project in a detailed log book.	5,9
CO107.6	Understand some of the decisions made by contemporary sound recordists, including the placement of microphones.	8

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO107.1	-	-	-	-	-	3	-	-	-	1	1
CO107.2	3	-	-	-	-	-	-	-	-	2	3
CO107.3	-	-	-	-	-	-	-	-	2	1	2
CO107.4	-	-	2	-	-	-	-	-	-	1	1
CO107.5	-	-	-	-	2	-	-	-	3	2	3
CO107.6	-	-	-	-	-	-	-	2	-	1	1

Sound Techniques was a recording studio in Chelsea, London that was operational between 1965 and 1976. Housed in a former dairy, it was founded by recording engineers Geoff Frost and John Wood.

Contents

- 1History
- 2Film
- 3Video games
- 4Music
- 5Recording
- 6Processing effects
- 7Aesthetics
- 8Techniques
- 9References
- 10External links

Textbooks/Reference Books/ Other Books/E-material/Paper

Sr.No	Title	Author	Publisher	Edition	Year of Edition
1	The Fundamentals of Sonic Arts and Sound Design	Tony Gibbs	-	-	2007
2	Designing Sound	Andy Farnell	-	-	2008
3	Sound Effects Bible	Ric Viers	-	-	-
4	Audio Postproduction for Digital Video	Jay Rose	-	-	-

Paper –III: Film Planning

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Story Boarding ,Character, Layout, Rigging, Sound
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/04/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	--/--/--/--

Course Outcomes (COs):

Course Outcomes(COs): Up on completion of this course, students will be able to	Mapping with PO's
--	-------------------

CO107.1	Develop your creativity and analytical skills by identifying quality story concepts and creating script breakdowns/analyses from at least two disciplinary perspectives.	9
CO107.2	Including: producing/production, management, screenwriting, directing, camera and lighting, editing, audio, art direction, set design, special effects and television studio production.	1
CO107.3	Develop an understanding of the industry as a whole by executing all components of development, pre-production, production and post-production planning in at least two disciplinary areas.	1
CO107.4	Contextualize the social, political, cultural, technological and/or artistic influences upon film and television stories.	8
CO107.5	Apply what you learn and prepare for employment by creating a portfolio or demo reel.	3
CO107.6	Prepare for employment by developing a plan based upon critical self-reflection and employer/placement feedback.	2

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO107.1	-	-	-		-	-	-	-	3	3	1
CO107.2	2	-	-			-		-	-	1	2
CO107.3	2	-	-	-		-		-	-	1	1
CO107.4	-	-	2	-		-	-	2	-	1	1
CO107.5	-	-	-	-	-	-	-	-		1	2
CO107.6	-	3	-	-	-	-	-	-		3	1

Film Planning

The best way to plan animations is to create storyboards of your project. This will help you look at your work with both a micro and macro lens. A storyboard is essentially a series of drawings that convey the shots you have in mind that address content, framing, camera angle, composition, etc. It also helps you bridge the divide between the image you have in your mind and the actual execution of the work.

Source:

Types of Animations

- Cell Animation
- 2D animation
- 3D Animation
- Motion Graphics
- Stop Motion
- 12 Basic Principles of Animation
 1. Squash and Stretch
 2. Anticipation
 3. Staging
 4. Straight Ahead Action and Pose to Pose
 5. Follow Through and Overlapping Action
 6. Slow In and Slow Out

7. Arcs
8. Secondary Action
9. Timing
10. Exaggeration
11. Solid Drawing
12. Appeal

Textbooks/Reference Books/ Other Books/E-material/Paper

Sr.No	Title	Author	Publisher	Edition	Year of Edition
1	Making Short Films	Clifford Thurlow	-	-	
2	Making Documentary Film and Videos	Barry Hampe	-	-	
3	Movie Planning with Imaginary Clara	Alex Ohnemus	-	-	-
4	The Ultimate Guide To Filmmaking	The Ultimate Guide To Filmmaking	-	-	-

A) Practical

100 Hrs.

- Story Boarding
- Title Adobe Premiere, Adobe After Effects
- Adobe Premiere, Adobe After Effects Compositing
- Sound Forge / Adobe Audition recording Remix song

B) Practical

116 Hrs.

- management, screenwriting, directing, camera and lighting,
- Editing, audio, art direction, set design,
- Special effects and television studio production.
- pre-production, production and post-production planning

C) Project Work

108Hrs.

- **Demo reel**
- **Short Film**

Semester -VI

Paper Number	Title of Paper (For Semester VI)	Total Marks
V	Script-writing	40 + 10 = 50
VI	2D Animation	40 + 10 = 50
VII	3D Animation	40 + 10 = 50
TOTAL		150

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	180	Projects/ Industry Visit	100
2	Portfolio	20		
Total		200		100

The total weightage of second term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 50 X 3	150
2	Practical Examination.	200
3	Internal Assessment	100
TOTAL		450

B. Nature of question paper:

For the papers V to VII there will be in all SEVEN questions in each paper of which any FIVE should be solved. All questions will carry equal marks i.e. each question will be of 10 marks.

General nature of the question paper will be:

Question Number	Type	
Q.1	Short answer	Any two out of three
Q.2,3,4,5,6	Long answer	No internal options.
Q.7	Short notes	Any two out of three

SYLLABUS:

N. B.

- (i) Figures shown in bracket indicate the total lectures required for the respective units.
- (ii) The question paper should cover the entire syllabus. Marks allotted to questions should be in proportion to the lectures allotted to respective to units.
- (iii) All units should be dealt with S.I. units.
- (iv) Project / Industrial visit per semester is compulsory.
- (v) Use of recent editions of reference books is essential.
- (vi) Use of Output Devise al

Paper –V :

Script-Writing

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Story Boarding ,Character, Layout, Screenwriting
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	02/02/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	--/--/--/--

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO107.1	Develop a working definition of drama that notes its divergence from other narrative forms	3
CO107.2	Understand the techniques, formats and style of story breakdowns, outlines, treatments, and screenplays.	4
CO107.3	Write screenplays for short film, feature film and television formats.	4
CO107.4	Convey story ideas both orally and in writing with clarity, conviction and style.	4
CO107.5	Demonstrate an understanding of the process by which writers submit scripts for production.	4
CO107.6	Understanding of the unification of form, content, and structure in a script.	4

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO107.1	-	-	3	-		-	-	-	-	1	1
CO107.2	-	-	-	3		-	-	-	-	1	2
CO107.3	-	-	-	3		-	-	-	-	2	1
CO107.4	-	-	-	3		-	-	-	-	1	2
CO107.5	-	-	-	3		-	-	-	-	1	2
CO107.6	-	-	-	3		-	-	-	-	1	2

The Five Key Points of Story Structure

One thing is true of all stories. They all have a beginning, middle and end. Film scripts typically run from 100 to 120 pages with each page representing about a minute of screen time. Within these script pages there will be five vital events.

There are five key points of story structure which are incredibly important in scriptwriting.

Feature assignment writing

Rewriting and script doctoring

Television writing

Writing for daily series

Writing for game shows

Theories on writing a screenplay

The Hero's Journey

Syd Field's Paradigm

The sequence approach

History

Textbooks/Reference Books/ Other Books/E-material/Paper

Sr.No	Title	Author	Publisher	Edition	Year of Edition
1	Screenplay	Syd Field	-	-	-
2	Making a Good Script Great	Linda Seger	-	-	-
3	Save the Cat	Blake Snyder	-	-	-
4	How Not to Write a Screenplay	Denny Martin Flynn	-	-	-

Paper –VI:**2D Animation**

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Classical animation & animation principals, Photoshop & Flash
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	02/02/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	--/--/--/--

Course Outcomes (COs):

Course Outcomes(COs):		Mapping with PO's
Up on completion of this course, students will be able to		
CO107.1	Sketch key emotions and body language.	4,5
CO107.2	Create drawings that convey action in terms of movement, emotion, attitude, and expression.	5
CO107.3	Develop and render advanced character movements through cycles of walking, running, throwing, and anticipation.	5
CO107.4	Manage project timelines, layers, and compositions for efficient animation.	2
CO107.5	Create drawings and paintings using custom brush libraries.	2,9
CO107.6	Export digital content for use in other software programs.	7

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO107.1	-	-	-	3	2	-	-	-	-	-	2
CO107.2	-	-	-	-	3	-	-	-	-	-	2
CO107.3	-	-	-	-	3	-	-	-	-	1	2
CO107.4	-	2	-	-	-	-	-	-	-	2	
CO107.5	-	3	-	-	-	-	-	-	2	2	1
CO107.6	-	-	-	-	-	-	2	-	-	3	

2D Animation

Animation is a method in which pictures are manipulated to appear as moving images. In traditional animation, images are drawn or painted by hand on transparent celluloid sheets to be photographed and exhibited on film.

Contents

- 1Etymology
- 2History
- 3Techniques
- 4Animator
- 5Production
- 6Criticism

Textbooks/Reference Books/ Other Books/E-material/Paper

Sr.No	Title	Author	Publisher	Edition	Year of Edition
1	The Illusion of Life	Frank Thomas and Ollie Johnston		-	
2	Animation: From Script to Screen	Shamus Culhane	-	-	-
3	Cartoon Animation	Preston Blair	-	-	-
4	Timing For Animation	Harold Whitaker and John Halas	-	-	-

PAPER : VII

3D Animation

50 hrs.

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Classical animation & animation principals, Photoshop , Maya
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	02/02/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	--/--/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO107.1	Communicate ideas, believable action and emotion effectively by employing principles of animation and performance in all aspects of drawing.	4,5
CO107.2	Create 3D characters and environments that reflect the integration of graphic clarity, design principles, performance principles and theoretical constructs.	5,7
CO107.3	Develop and render advanced character movements through cycles of walking, running, throwing, and anticipation.	5

CO107.4	Manage project timelines, layers, and compositions for efficient animation.	9
CO107.5	Coordinate and manage the production of a student film, including the aspects of cinematography, art direction and editing.	1,9
CO107.6	Generate work that reflects initiative, creativity, adaptability.	8

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CO107.1	-	-	-	3	2	-	-	-	-	1	-
CO107.2	-	-	-	-	3	-	-	-	-	1	-
CO107.3	-	-	-	-	3	-	1	-	-	-	2
CO107.4	-	-	-	-	-	-	-	-	3	1	-
CO107.5	1	-	-	-	-	-	-	-	3	-	2
CO107.6	-	-	-	-	-	-	-	3	-	-	2

PAPER : VII

3D Animation

50 hrs.

3D Animation

3D Animation Computer animation is the process used for digitally generating animated images. The more general term computer-generated imagery (CGI) encompasses both static scenes and dynamic images, while computer animation only refers to the moving images. Modern computer animation usually uses 3D computer graphics, although 2D computer graphics are still used for stylistic, low bandwidth, and faster real-time renderings. Sometimes, the target of the animation is the computer itself, but sometimes film as well.

Contents

History

Animation methods

Modelling

Facial animation

Web animations

Textbooks/Reference Books/ Other Books/E-material/Paper

Sr.No	Title	Author	Publisher	Edition	Year of Edition
1	3D Animation for the Raw Beginner Using Autodesk Maya	Roger King	-	-	-

2	Autodesk Maya 2018 Basics Guide	Murdoch Kelly	-	-	-
3	The Art of 3D Computer Animation and Effets	Isaac V. Kerlow	-	-	-
4	Mastering Autodesk Maya 2016	Palamar Todd	-	-	-

A) Practical

100 Hrs.

- Story Telling
- Short Story
- 2d / 3d Animation
- Walk cycle, Run cycle, jump, Facial Expression

B) Practical

116Hrs.

- Screenplay is written
- film is distributed, marketed, and screened in cinemas and/or released to home video.

C) Project Work

108Hrs.

- Movies (2d / 3d Animation)

VIVEKANAND COLLEGE, KOLHAPUR
(AUTONOMOUS COLLEGE)

Board of Studies in
B.Voc.
Photography & Videography

Syllabus

For

B.Voc.

Part III

B. Voc Photography & Videography

(To be implemented from Academic Year 2023-2024 onwards)

B.Voc. Photography & Videography

STRUCTURE OF SYLLABUS:

To be implemented from the academic year 2023-2024

A. INTRODUCTION

Photography & Videography Business

Like every other business or profession, photography business is booming these days and it comes with a lot of competition in market. Therefore we'll teach our students how to pitch an idea to the client, process of bidding, cost-effective budgeting, picking locations, obtaining permits, training your models, choosing props, testing, selecting, renting, insuring equipment, invoicing and above all shooting the assignment within the planned time and budget constraints.

Career

Career opportunities include professional practice with newspapers, magazines and digital media houses; empanelment with select advertising agencies, brands, corporate, industrial houses; freelance in their area of interest in Various sector in multimedia.

Photographers/videographer are at times, paid a certain amount of money for each picture & Video that they shoot or paid an hourly rate or salary. Their earnings or salaries can vary depending on their experience and talent.

Career opportunities

- Portrait Photographer/ Videographer
- Studio Photographer/ Videographer
- Landscape Photographer/ Videographer
- News Photographer/ Videographer
- Sports Photographer/ Videographer
- Wildlife Photographer/ Videographer
- Travel Photographer/ Videographer
- Event Photographer/ Videographer
- Photo Journalism
- Video Journalism
- Freelance Press Photographer/ Videographer
- Freelance Photographer / Videographer
- Advertisement Photographer / Videographer
- Short film
- Documentary Photographer / Videographer
- Presentation Photographer / Videographer
- Films
- Songs
- **Commercial Project**
- Architecture Photographer / Videographer
- Forensic Photographer / Videographer
- Industrial Photographer / Videographer

- Still Photographer
- Fashion Photographer / Videographer
- E-Commerce Photographer / Videographer
- YouTube Chanel Videographer
- Commercial Photographer / Videographer

2. Duration:

The duration of the B.Voc Degree will be of **Three years.**

▪ B. Voc. Part I, II, III

The final Degree will be awarded only after completion of two year course. The suggested credits for each of the years are as follows:

Awards		Normal calendar duration	Skill Component Credits	General Education Credits
Year 1	B.Voc. Diploma in Photography & Videography	Two Semesters	30	24
Year 2	B.Voc. Advance Diploma in Photography & Videography	Four Semesters	30	24
Year 3	B.Voc. in Photography & Videography Part III	Six Semesters	30	
TOTAL			90	48

General Education Component should not exceed 40% of the total curriculum.

Credits can be defined as the workload of a student in

1. Lectures
2. Practical
3. Seminars
4. Private work in the Library/home
5. Examination
6. Other assessment activities.

The following formula should be used for conversion of time into credit hours.

- a) One Credit would mean equivalent of 15 periods of 60 minutes each, for theory, workshops /labs and tutorials;
- b) For internship/field work, the credit weight age for equivalent hours shall be 50% of that for lectures/workshops;
- c) For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

3. Eligibility:

1. The eligibility condition for admission to B.Voc. Photography & Videography programme shall be 10+2 or equivalent, in any stream from any recognized board or university.

2. The eligibility condition for admission to B.Voc. Photography & Videography programme shall be Advance Diploma in Photography from any recognized board or university.

2. The eligibility condition for admission to B.Voc. Photography & Videography for Part II programme shall be. Diploma In Photography, Diploma In Event Photography, Diploma In Cinematography from any recognized board or university.

4. Medium of Instruction:

The medium of instruction of the course will be **Marathi / English**

5. Pattern: Semester Pattern.

6. Examination:

A. Scheme of examination:

- The semester examination will be conducted at the end of each term (both theory and practical examination)

- Theory paper will be of 50 marks each. The practical examination will be of 200 marks and industrial practical training/project work is of 50 marks.

- Question papers will be set in the view of the entire syllabus and preferably covering each unit of the syllabus.

For each semester there will be four theory papers. Practical Examination will be conducted at the end of every semester.

SEMESTER V

Paper Number	Title of Paper (For Semester I)	Internal Marks	Theory Exam Marks	Total Marks
I	Cinematography	10	40	50
II	Professional Photography-I	10	40	50
III	Software skill – I	10	40	50
IV	Photo Documentary	10	40	50
TOTAL		40	160	200

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical A	90	Projects	50
2	Practical B	90		
3	Project	20		
Total		200		50

A. Nature of Examination:

B. Nature of question paper:

For the papers VI to VIII there will be in all SEVEN questions in each paper of which any FIVE should be solved. All questions will carry equal marks i.e. each question will be of 10 marks.

General nature of the question paper will be:

Question Number	Type		Marks
Q.1	MCQ	No internal options	8
Q.2	Long answer	Any two out of three	16
Q.3	Short notes	Any four out of six	16

Cinematography

Name of Course Teacher:	Mr. Rushikesh Shivaji Goni
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge of basic techniques of arrangements of light and there reflections
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand Cinematography	1
CF107.2	Understand Cinema Camera	1
CF107.3	Understand Cinematic Composition	2
CF107.4	Understand Basic Camera Movements	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2	PSO3	PSO 4
CO 1	3	2	3	3	2	2	2	1	2	1
CO 2	2	1	2	1	2	1	2	3	2	1
CO 3	3	2	1	2	3	2	1	3	2	3
CO 4	3	2	1	2	2	1	1	2	2	3
Average	2.75	1.75	1.75	2	2.25	1.5	1.5	2.25	2	2

Course Contains :

Unite : 1

1. History of Film Camera
2. History of Cinema
3. Motion Pictures & Cinematography
4. About Cinematography

Unite : 2

1. Compositing
2. Visual Story Tailing
3. Understanding writing for cinematography
4. Process of cinematography
5. About film making
6. Camera Movements

Unite : 3

1. Exposure
2. Depth of field
3. Focus
4. Focus puller

Unite : 4

1. NTSC
2. PAL
3. Recording formats
4. Sound

Professional Photography –I

Name of Course Teacher:	Mr. Raviraj Shamarao Sutar
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of object motion , light traveling and reflection of light
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand working with professional light for photography	1
CF107.2	Understand White shadowless background Photography	2
CF107.3	Understand White Creative background Photography	2
CF107.4	Understand fashion Photography	4

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2	PSO3	PSO 4
CO 1	3	3	2	3	2	1	2	3	2	1
CO 2	2	3	3	1	2	3	2	1	1	2
CO 3	3	2	1	2	3	2	1	2	3	3
CO 4	2	3	2	1	2	3	2	1	2	3
Average	2.5	2.75	2	1.75	2.25	2.25	1.75	1.75	2	2.25

Course Contents:

Unite 1: Wild Life

1. Understanding Wild Life
2. Understanding Habitat
3. Journey
4. Conservation
5. Visits

Unite 2: Geographical

1. Astrography
2. Lithology
3. Aerial
4. Landscape

Unite 3: Macro

1. Insects
2. Fungi
3. Jewellery
4. Plants

Unite: Sports

1. Traditional Sports
2. Sports Photography Techniques
3. Drone Photography
4. Candid Shots

Software Skill -1

Name of Course Teacher:	Mr. Akshaykumar Satappa Khot
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of elements and principles in Photography editing
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand Color grading for in photo editing software	1
CF107.2	Understand Action making in photo editing software e	2
CF107.3	Understand Color Background changing in photo editing software	2
CF107.4	Understand Album layout in photo editing software	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2	PSO3	PSO 4
CO 1	3	2	3	2	3	2	1	3	2	1
CO 2	3	2	2	3	2	1	2	3	1	2
CO 3	3	2	3	2	2	3	3	3	2	3
CO 4	3	3	3	2	2	3	2	3	2	3
Average	3	2.25	2.75	2.25	2.25	2.25	2	2.25	1.75	2.25

Course Content:

Unite: 1

1. Match Colors
2. Digital Painting
3. Advance Color Grading
4. Metal to Gold
5. Product Retouching

Unite: 2

1. Realistic Hair
2. Realistic Tattoo
3. Back light Photos
4. Motion, Tilt Shift
5. Add Color to Sky

Unite: 3

1. Sky Replacement
2. Color Gel Lighting
3. Double Exposure
4. Creative Line Art

Unite: 4

1. Water And Reflection
2. Dual Lighting Effect
3. Overlays, Extinction's
4. 2D Photo to 3D
5. Black white to Color Photo

Photo Documentary

Name of Course Teacher:	Mr. Mangesh Vilasrao Khole
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of editing through Software
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understanding Jaggery Photo Documentary	1
CF107.2	Understanding Kolhapuri Chappal Photo Documentary	2
CF107.3	Understanding Sculpture Photo Documentary	2
CF107.4	Understanding Food Processing Photo Documentary	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2	PSO3	PSO 4
CO 1	3	3	2	3	2	3	1	2	3	2
CO 2	3	2	3	1	2	3	2	1	3	2
CO 3	3	2	3	2	3	1	2	3	2	1
CO 4	2	3	2	3	2	3	1	3	2	3
Average	2.75	2.5	2.5	2.25	2	2.5	1.5	2.25	2.5	2

Course Content :

Unite: 1 Product

1. Kolhapuri chappal
2. Music Instruments
3. Sculpture
4. Food

Unite: 2 Lifestyle

1. Rural
2. Urban
3. Occupation
4. Human
5. Animal

Unite: 3 Social

1. Social Problems
2. Awareness
3. Good and Bad Things
4. Natural Disaster

Unite: 4 Travel

1. Place
2. Monuments
3. Temple
4. The Fair

SEMESTER VI

Paper Number	Title of Paper (For Semester I)	Internal Marks	Theory Exam Marks	Total Marks
I	Cinematography II	10	40	50
II	Professional Photography – II	10	40	50
III	Software Skill – II	10	40	50
IV	Video Documentary	10	40	50
TOTAL		40	160	200

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical A	90	Projects	50
2	Practical B	90		
3	Project	20		
Total		200		50

Cinematography II

Name of Course Teacher:	Mr. Rushikesh Shivaji Goni
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of object motion , light traveling and reflection of light
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understanding Cinematography Tools	1
CF107.2	Understanding Cinemascope and Film Shooting	2
CF107.3	Learning Gimble, Steadicam and Rigs	2
CF107.4	Understand Chroma and VFX	4

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2	PSO3	PSO 4
CO 1	3	3	2	3	2	1	2	3	2	1
CO 2	2	3	3	1	2	3	2	1	1	2
CO 3	3	2	1	2	3	2	1	2	3	3
CO 4	2	3	2	1	2	3	2	1	2	3
Average	2.5	2.75	2	1.75	2.25	2.25	1.75	1.75	2	2.25

Course Contents:

Unite 1

1. Advance Film Camera
2. Types of Film Cameras
3. Cinematography Tools
4. Types of Cinematography

Unite 2

1. Shooting Technic
2. Cinematic Lighting
3. Cinemascope
4. Film Shooting

Unite 3

1. Arial Shooting
2. Steadicam
3. Gimbal
4. Types of Rigs

Unite 4

1. Green Screen and Blue Screen
2. Cinematography Elements 5C's
3. Camera Advance Movements
4. Responsibility of Cinematographer

Professional Photography – II

Name of Course Teacher:	Mr. Raviraj Shamarao Sutar
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge of basic techniques of arrangements of light and there reflections
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand Event Photography	1
CF107.2	Understand Architectural Photography	1
CF107.3	Understand Advertising Commercial Photography	2
CF107.4	Understand Photography documentary	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2	PSO3	PSO 4
CO 1	3	2	3	2	1	2	3	2	1	2
CO 2	2	1	2	3	3	2	1	2	1	2
CO 3	2	1	2	3	2	1	2	3	2	2
CO 4	2	3	2	3	2	3	2	1	2	3
Average	2.25	1.75	2.25	2.75	2	2	2	2	1.5	2.25

Course Contains:

Unite 1: Advertising Commercial

1. Hotels
2. Company Product
3. Shop
4. Fashion & Modeling

Unite 2: Portfolio Development

1. Self Presentation
2. Business Presentation.
3. Marketing & Branding

Unite 3 Professional Ethics & Copyrights

1. Ethics of Photography
2. Copyright Law
3. Protecting

Software Skill – II

Name of Course Teacher:	Mr. Akshaykumar Satappa Khot
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge of basic techniques of arrangements of light and there reflections
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand Manipulation in Photo editing software	1
CF107.2	Understand Miniature Photography editing	1
CF107.3	Understand Creative album designing	2
CF107.4	Understand Poster making	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2	PSO3	PSO 4
CO 1	3	3	2	3	2	3	1	2	3	2
CO 2	3	2	3	1	2	3	2	1	3	2
CO 3	3	2	3	2	3	1	2	3	2	1
CO 4	2	3	2	3	2	3	1	3	2	3
Average	2.75	2.5	2.5	2.25	2	2.5	1.5	2.25	2.5	2

Course Contains:

Unite 1

1. Shape the Light with Creative Color Grading
2. Create Multi Color Eyes
3. Skin Tone with Color Code

Unite 2

1. Match Color with Background
2. Realistic Mockup
3. Place Design to T-shirt
4. Dual Lighting Effect
5. Remove Shadow

Unite 3

1. Product Backdrops With Shadows
2. Uncrumple Scanned Document
3. Blend on any Surface
4. Add Any pattern to cloths

Unite 4

1. Photoshop Tips & Tricks
2. Color Correction with Eye Point Technique
3. Missed Focus To Sharp Focus
4. Window Shadow
5. Frequency separation Skin Tone
6. Remove Wrinkles from Clothes
7. Add Light or Shine,

Video Documentary

Name of Course Teacher:	Mr. Mangesh Khole
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of editing through Software
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand Concept Video Documentary	1
CF107.2	Understand Social Video Documentary	2
CF107.3	Understand Political Video Documentary	2
CF107.4	Understand Educational Video Documentary	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

Out Comes	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2	PSO3	PSO 4
CO 1	3	2	3	2	3	2	3	1	3	3
CO 2	3	2	1	2	1	3	2	1	3	1
CO 3	3	1	1	2	3	2	1	2	3	1
CO 4	3	2	1	2	3	2	1	3	3	3
Average	3	1.75	1.5	2	2.5	2.25	1.75	1.75	3	2

Contents

Unite: 1 Product

1. Jaggery House
2. Agriculture Weapons
3. Sculpture
4. Food
5. Garment

Unite: 2 Lifestyle

6. Rural
7. Urban
8. Occupation
9. Human
10. Animal

Unite: 3 Social

5. Social Problems
6. Awareness
7. Good & Bad Things
8. Natural Disaster

Unite: 4 Travel Video

5. Location
6. Monuments
7. Temple
8. The Fair

SYLLABUS

DIPLOMA IN CINEMATOGRAPHY

SEMESTER – I

GENERAL EDUCATION:

Paper – I: English for Business Communication:

Total Workload: 06 lectures per week of 60 mins.

Distribution of Workload:

Theory: 04 lectures per week

Practical: 02 lectures per week per batch of 20 students

Units Prescribed for Theory:

40 Marks.

Unit 1: Use of English in Business Environment

Topics:

Business Vocabulary: Vocabulary for banking, marketing and for maintaining public relations

What is a sentence?

Elements of a sentence

Types of sentence: Simple, compound, complex

Unit 2: Writing a Letter of Application and CV/ Resume

Topics:

Structure of a letter of application for various posts

CV/ Resume and its essentials

Unit 3: Presenting Information/Data

Topics:

Presenting information/data using graphics like tables, pie charts, tree diagrams, bar diagrams, graphs, flow charts

Unit 4: Interview Technique

Topics:

Dos and don'ts of an interview

Preparing for an interview

Presenting documents

Language used in an interview

Practical: Based on the theory units

10 Marks.

Reference Books:

Sethi, Anjane & Bhavana Adhikari. *Business Communication*. New Delhi: Tata McGraw Hill

Tickoo, Champa & Jaya Sasikumar. *Writing with a Purpose*. New York: OUP, 1979.

Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication, 2008.
 Herekar, Praksh. *Business Communication*. Pune: Mehta Publications, 2007.
 Herekar, Praksh. *Principals of Business Communication*. Pune: Mehta Publications, 2003.
 Rai, Urmila & S. M. Rai. *Business Communication*. Himalaya Publishing House, 2007.
 Pradhan, N. S. *Business Communication*. Mumbai: Himalaya Publishing House, 2005.
 Pardeshi, P. C. *Managerial Communication*. Pune: NiraliPrakashan, 2008.

SKILL BASED PAPERS:

Paper –II: Fundamental of Cinematography

Name of Course Teacher:	Mr. Rushikesh Shivaji Goni
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge meaning and proper use of camera
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand the basic techniques of using professional cameras	1
CF107.2	Understand the basic lights arrangements for indoor and outdoor photography. Illustrate understanding of colour variations Develop and demonstrate ability to recognize ambience light	2
CF107.3	Developing the sense to Understand reflected light , Colour of light and creating proper Image	2
CF107.4	To develop the basic knowledge of composition for photography.	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
 1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-	-
CF107.4	-	-	2	-	-	-	-	-	-	-	-

Course Content :

1. Basics types of Optics using in lances
2. Science behind image formation.
3. Introduction to western philosophy
4. Arrangement of framing styles
5. Finding Story
6. Creating Story
7. Position of camera and oprater
8. Composition of photography
9. Understanding ambiance light and reflection
10. Understanding Creative light and direction
11. Developing Eye.
12. Creating social awareness.
13. Types photography

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Photography	Dr. Jitendra Kater	Generic-2011	-	2015
2	Digital Photography-Camera & Photography	Dr. Jitendra Kater	Generic-2011	-	2015
3	Western Maharashtra	Raman Kulkarni	Maharashtra Ecotourism Development Board, Nagpur		2018
4	The Beginner Photography Guide	D.K.	Dorling Kindersley ltd.	-	2016

Paper –III : Cinematography Analysis I

Name of Course Teacher:	Mr. Rushikesh Shivaji Goni
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of Studio and ambiance light for photography.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO 1	Discover the basic principles of Light reflection and their intensity .	1
CO 2	Encourage to adopt a creative approach to problem solving and to become self-critical in the Lighting of the work.	2
CO 3	Develop the various methods of creating light for photography	2
CO 4	Understand the use of accessories for using indoor & outdoor photography	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107. 1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	2	-	-	-	-	-	-	-	-	-
CF107.4	-	-	1	-	-	-	-	-	-	-	-

Course Content :

1. Lighting Basics
2. Nature of Light
3. Different properties of light- direction, intensity, color
4. Different lighting instruments
5. Different lighting accessories
6. Portrait Lighting Patterns- Split lighting, loop lighting, Rembrandt lighting, butterfly lighting.
7. Creative Lighting Introduction
8. Lenses – types, properties, aberrations.
9. Photographic Optics – camera lenses – technical development
10. Image sensors- different types working
11. Science behind image formation in human camera

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	On Photography	Susan Sontag	Farrar, Straus and Giroux	-	1977
2	Handbook of Photography	Cengage Learning	Thompson Delmar Learning	-	2006
3	Painting With Light	John Alton	Pearson Education	-	2008
4	"Principles of Compiler Design"	Alfred V Aho	Narosa Publishing House	-	2002

Paper IV: Basic Video Editing

Name of Course Teacher:	Mr. Rushikesh Shivaji Goni
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge of Handling software
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Provide exposure to images and information to inspire great work, further study, and exploration. Organize information for better communication.	1
CF107.2	Understand the basic editing tools and there use for editing	1
CF107.3	Understand the techniques of image editing for printing	1
CF107.4	Understand unification/separation of design and society. Unification/separation of design and technology.	2

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	2	-	-	-	-	-	-	-	-	-	-
CF107.3	2	-	-	-	-	-	-	-	-	-	-
CF107.4	-	1	-	-	-	-	-	-	-	-	-

Course Content :

- History of Photoshop
- Need of editing
- Work with the Start workspace : A first look at the Photoshop working area A: *Tools panel* | B: *History panel* | C: *Color panel* | D: *Creative Cloud Libraries panel* | E: *Layers panel*
- Different brightness levels: Choose Edit > Preference (Windows) or Photoshop > Preferences (Mac OS) and select a Color Theme swatch in the Interface section.

5. Maximized screen space: Click the button at the bottom of the toolbar to switch between Standard and Fullscreen display modes.
6. Creating Documents
7. Use Tools
8. Default key board shortcuts
9. Menu bar
10. Filters
11. Plug-in & Presets
12. Define Brush
13. Sizing of Image
14. Colors of pixel
15. Grounds

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Sampurn Photoshop	Sou Sujata Athavale, Narendra Athavale	-	-	2016
2	Photoshop for Lightroom User	Scott Kelvy	-	-	2013
3	Master In Photoshop	Solition web tech. Inc.	Khanna Publisher	-	-

B) Practical

A) Software Skill Development

1) Adobe Premiere – Basic **50 Hrs.**

B) Designing Skill Development **100 Hrs.**

- 1) Use of Tools
- 2) Colour Scheme Implementation
- 3) Basic Layout
- 4) Designing and Effects

C) Project Work **50 Hrs.**

- 1) Photo Slideshow
- 2) Sound and Effects
- 3) Video Editing

SEMESTER II

A. Nature of Examination:

For second semester there will be four theory papers. Practical Examination will be conducted at the end of the semester.

Paper Number	Title of Paper (For Semester II)	Internal Marks	Theory Exam Marks	Total Marks
V	Business Communication II	10	40	50
VI	Shooting Techniques	10	40	50
VII	Cinematography Analysis II	10	40	50
VIII	Post Processing	10	40	50
TOTAL		40	160	200

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	180	Projects/ Industry Visit	50
2	Portfolio	20		
	Total	200		50

The total weightage of second term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 50 X 4	200
2	Practical Examination.	200
3	Internal Assessment	50
	TOTAL	450

B. Nature of question paper:

For the **papers VI to VIII** there will be in all **SEVEN** questions in each paper of which any **FIVE** should be solved. All questions will carry equal marks i.e. each question will be of 10 marks.

General nature of the question paper will be:

Question Number	Type		Marks
Q.1	MCQ	No internal options	8
Q.2	Long answer	Any two out of three	16
Q.3	Short notes	Any four out of six	16

SYLLABUS:

SEMESTER II

GENERAL EDUCATION PAPER:

**CC part-I (Diploma)
English for Business Communication-II**

Semester –II

Paper: V

Total Workload: 06 lectures per week of 60 mins.

Distribution of Workload:

Theory: 04 lectures per week

Practical: 02 lectures per week per batch of 20 students

Units Prescribed for Theory:

Unit 5: Group Discussion

Topics:

Preparing for a Group Discussion

Initiating a Discussion

Eliciting Opinions, Views, etc.

Expressing Agreement/ Disagreement

Making Suggestions; Accepting and Declining Suggestions

Summing up.

Unit 6: Business Correspondence

Topics:

Writing Memos, e-mails, complaints, inquiries, etc.

Inviting Quotations

Placing Orders, Tenders, etc.

Unit 7: English for Negotiation

Topics:

Business Negotiations

Agenda for Negotiation

Stages of Negotiation

Unit 8: English for Marketing

Topics:

Describing/ Explaining a Product/ Service

Promotion of a Product

Dealing/ bargaining with Customers

Marketing a Product/ Service: Using Pamphlets, Hoardings, Advertisement,

Public Function/ Festival

Practical: Based on the theory units

Reference Books:

- Herekar, Praksh. *Business Communication*. Pune: Mehta Publications, 2007.
 Herekar, Praksh. *Principals of Business Communication*. Pune: Mehta Publications, 2003.
 John, David. *Group Discussions*. New Delhi: Arihant Publications.
 Kumar, Varinder. *Business Communication*. New Delhi: Kalyani Publishers, 2000.
 Pardeshi, P. C. *Managerial Communication*. Pune: NiraliPrakashan, 2008.
 Pradhan, N. S. *Business Communication*. Mumbai: Himalaya Publishing House, 2005
 Rai, Urmila& S. M. Rai. *Business Communication*. Mumbai: Himalaya Publishing House, 2007.
 Sethi, Anjanee&BhavanaAdhikari. *Business Communication*. New Delhi: Tata McGraw Hill.
 Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication, 2008.

SKILL BASED PAPERS :**Paper –VI: Shooting Techniques**

Name of Course Teacher:	Mr. Rushikesh Shivaji Goni
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of object motion , light traveling and reflection of light
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand proper use for photography of ambiance light	1
CF107.2	Understand to creating light for self creativity of their work	2
CF107.3	Develop the motion sense and create proper exposure	2
CF107.4	Understand Light Physics for creativity	4

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PasdfhO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107. 1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	2	-	-	-	-	-	-	-	-	-
CF107.3	-	1	-	-	-	-	-	-	-	-	-
CF107.4	-	-	1	-	-	-	-	-	-	-	-

Course Contents :

1. Highlight & Shadow
2. Motion Blur Picture
3. Reflection
4. ND Filter (Natural Density)
5. Ambiance Direction & reflection
6. Light Sensitivity
7. Indoor Light Direction & reflection
8. High speed synchronization

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Photography	Dr. Jitendra Kater	Generic-2011	-	2015
2	Digital Photography-Camera & Photography	Dr. Jitendra Kater	Generic-2011	-	2015
3	Western Maharashtra	Raman Kulkarni	Maharashtra Ecotourism Development Board, Nagpur		2018
4	The Beginner Photography Guide	D.K.	Dorling Kindersley ltd.	-	2016

Paper –VII: Cinematography Analysis (Part 2)

Name of Course Teacher:	Mr. Rushikesh Shivaji Goni
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge of basic techniques of arrangements of light and there reflections
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand creating glamour, split, butterfly light, rembrandt light, Rim light, High Key & Low Key .	1
CF107.2	Understand the colors of light and creating innovative image frame.	1
CF107.3	Study the flexible setting of various cameras for photography .	2
CF107.4	Use techniques for solving problem during photography.	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	3	-	-	-	-	-	-	-	-	-	-
CF107.3	-	1	-	-	-	-	-	-	-	-	-
CF107.4	-	-	2	-	-	-	-	-	-	-	-

Course Contains :

1. Flat Light
2. Split Light
3. Rim Light
4. Rembrandt Light
5. Butterfly Light
6. Key Light
7. Fill Light
8. High Key
9. Low Key
10. 8 by 8 Formula
11. 16 by 16 formula
12. Outdoor Motion picture

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Photography	Dr. Jitendra Kater	Generic-2011	-	2015
2	Digital Photography-Camera & Photography	Dr. Jitendra Kater	Generic-2011	-	2015
3	Western Maharashtra	Raman Kulkarni	Maharashtra Ecotourism Development Board, Nagpur		2018
4	The Beginner Photography Guide	D.K.	Dorling Kindersley ltd.	-	2016

Paper –VIII: Post Processing

Name of Course Teacher:	Mr. Rushikesh Shivaji Goni
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of elements and principles in Photography editing
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand the art Photography and using as per necessary filters.	1
CF107.2	Know all details in light and shadows and manage proper combination of light.	2
CF107.3	Understand types of perspective of object. and making proper lens correction	2
CF107.4	Use perspective in various designs, action, created by using Photoshop Software	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	1	-	-	-	-	-	-	-	-	-
CF107.3	-	1	-	-	-	-	-	-	-	-	-
CF107.4	-	-	2	-	-	-	-	-	-	-	-

Course Content :

1. ID packaging
2. Sizing
3. Color Correction
4. Level Control
5. Action
6. Plug-in
7. Filter
8. Pallets
9. Masking

SYLLABUS

DIPLOMA IN EVENT PHOTOGRAPHY

SEMESTER – I

GENERAL EDUCATION:

Paper – I: English for Business Communication:

Total Workload: 06 lectures per week of 60 mins.

Distribution of Workload:

Theory: 04 lectures per week

Practical: 02 lectures per week per batch of 20 students

Units Prescribed for Theory:

40 Marks.

Unit 1: Use of English in Business Environment

Topics:

Business Vocabulary: Vocabulary for banking, marketing and for maintaining public relations

What is a sentence?

Elements of a sentence

Types of sentence: Simple, compound, complex

Unit 2: Writing a Letter of Application and CV/ Resume

Topics:

Structure of a letter of application for various posts

CV/ Resume and its essentials

Unit 3: Presenting Information/Data

Topics:

Presenting information/data using graphics like tables, pie charts, tree diagrams, bar diagrams, graphs, flow charts

Unit 4: Interview Technique

Topics:

Dos and don'ts of an interview

Preparing for an interview

Presenting documents

Language used in an interview

Practical: Based on the theory units

10 Marks.

Reference Books:

Sethi, Anjane & Bhavana Adhikari. *Business Communication*. New Delhi: Tata McGraw Hill

Tickoo, Champa & Jaya Sasikumar. *Writing with a Purpose*. New York: OUP, 1979.

Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication, 2008.

Herekar, Praksh. *Business Communication*. Pune: Mehta Publications, 2007.

Herekar, Praksh. *Principals of Business Communication*. Pune: Mehta Publications, 2003.
Rai, Urmila & S. M. Rai. *Business Communication*. Himalaya Publishing House, 2007.
Pradhan, N. S. *Business Communication*. Mumbai: Himalaya Publishing House, 2005.
Pardeshi, P. C. *Managerial Communication*. Pune: NiraliPrakashan, 2008.

SKILL BASED PAPERS:

Paper –II: Foundation Photography

Name of Course Teacher:	Mr. Mangesh Vilasrao Khole
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge meaning and proper use of camera
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107. 1	Understand the basic techniques of using professional cameras	1
CF107.2	Understand the basic lights arrangements for indoor and outdoor photography. Illustrate understanding of colour variations Develop and demonstrate ability to recognize ambient light	2
CF107.3	Developing the sense to Understand reflected light , Colour of light and creating proper Image	2
CF107.4	To develop the basic knowledge of composition for photography.	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107. 1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-	-
CF107.4	-	-	2	-	-	-	-	-	-	-	-

Course Content :

1. Basics types of Optics using in lances
2. Science behind image formation.
3. Introduction to western philosophy
4. Arrangement of framing styles

5. Finding Story
6. Creating Story
7. Position of camera and oprater
8. Composition of photography
9. Understanding ambiance light and reflection
10. Understanding Creative light and direction
11. Developing Eye.
12. Creating social awareness.
13. Types photography

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Photography	Dr. Jitendra Kater	Generic-2011	-	2015
2	Digital Photography- Camera & Photography	Dr. Jitendra Kater	Generic-2011	-	2015
3	Western Maharashtra	Raman Kulkarni	Maharashtra Ecotourism Development Board, Nagpur		2018
4	The Beginner Photography Guide	D.K.	Dorling Kindersley Ltd.	-	2016

Paper –III : Photography Technique part I

Name of Course Teacher:	Mr. Mangesh Vilasrao Khole
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of Studio and ambience light for photography.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO 1	Discover the basic principles of Light reflection and their intensity .	1
CO 2	Encourage to adopt a creative approach to problem solving and to become self-critical in the Lighting of the work.	2
CO 3	Develop the various methods of creating light for photography	2
CO 4	Understand the use of accessories for using indoor & outdoor photography	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	2	-	-	-	-	-	-	-	-	-
CF107.4	-	-	1	-	-	-	-	-	-	-	-

Course Content :

1. Lighting Basics
2. Nature of Light
3. Different properties of light- direction, intensity, color
4. Different lighting instruments
5. Different lighting accessories
6. Portrait Lighting Patterns- Split lighting, loop lighting, Rembrandt lighting, butterfly lighting.
7. lighting.
8. Creative Lighting Introduction
9. Lenses – types, properties, aberrations.

10. Photographic Optics – camera lenses – technical development
11. Image sensors- different types working
12. Science behind image formation in human camera

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	On Photography	Susan Sontag	Farrar, Straus and Giroux	-	1977
2	Handbook of Photography	Cengage Learning	Thompson Delmar Learning		2006
3	Painting With Light	John Alton	Pearson Education	-	2008
4	"Principles of Compiler Design"	Alfred V Aho	Narosa Publishing House	-	2002

Paper IV: Basic Photoshop

Name of Course Teacher:	Mr. Akshaykumar Satappa Khot
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge of Handling software
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Provide exposure to images and information to inspire great work, further study, and exploration. Organize information for better communication.	1
CF107.2	Understand the basic editing tools and there use for editing	1
CF107.3	Understand the techniques of image editing for printing	1
CF107.4	Understand unification/separation of design and society. Unification/separation of design and technology.	2

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	2	-	-	-	-	-	-	-	-	-	-
CF107.3	2	-	-	-	-	-	-	-	-	-	-
CF107.4	-	1	-	-	-	-	-	-	-	-	-

Course Content :

- History of Photoshop
- Need of editing
- Work with the Start workspace : A first look at the Photoshop working area A: *Tools panel / B: History panel / C: Color panel / D: Creative Cloud Libraries panel / E: Layers panel*
- Different brightness levels: Choose Edit > Preference (Windows) or Photoshop

- > Preferences (Mac OS) and select a Color Theme swatch in the Interface section.
- 5. Maximized screen space: Click the button at the bottom of the toolbar to switch between Standard and Fullscreen display modes.
- 6. Creating Documents
- 7. Use Tools
- 8. Default key board shortcuts
- 9. Menu bar
- 10. Filters
- 11. Plug-in & Presets
- 12. Define Brush
- 13. Sizing of Image
- 14. Colors of pixel
- 15. Grounds

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Sampurn Photoshop	Sou Sujata Athavale, Narendra Athavale	-	-	2016
2	Photoshop for Lightroom User	Scott Kelvy	-	-	2013
3	Master In Photoshop	Solition web tech. Inc.	Khanna Publisher	-	-

B) Practical

A) Software Skill Development

1) Photoshop – Basic **50 Hrs.**

B) Designing Skill Development 100 Hrs.

- 1) Use of Tools
- 2) Colour Scheme Implementation
- 3) Basic Layout
- 4) Designing and Effects

C) Project Work 50 Hrs.

- 1) Background Changing
- 2) Object replacement
- 3) Size and Layout

SEMESTER II

A. Nature of Examination:

For second semester there will be four theory papers. Practical Examination will be conducted at the end of the semester.

Paper Number	Title of Paper (For Semester II)	Internal Marks	Theory Exam Marks	Total Marks
V	Business Communication II	10	40	50
VI	Traditional Events	10	40	50
VII	Corporate Events	10	40	50
VIII	Photo Editing	10	40	50
TOTAL		40	160	200

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	180	Projects/ Industry Visit	50
2	Portfolio	20		
Total		200		50

The total weightage of second term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 50 X 4	200
2	Practical Examination.	200
3	Internal Assessment	50
	TOTAL	450

B. Nature of question paper:

For the papers VI to VIII there will be in all SEVEN questions in each paper of which any FIVE should be solved. All questions will carry equal marks i.e. each question will be of 10 marks.

General nature of the question paper will be:

Question Number	Type		Marks
Q.1	MCQ	No internal options	8
Q.2	Long answer	Any two out of three	16
Q.3	Short notes	Any four out of six	16

**SYLLABUS
SEMESTER II**

GENERAL EDUCATION PAPER:

**CC part-I (Diploma)
English for Business Communication-II**

Semester –II

Paper: V

Total Workload: 06 lectures per week of 60 mins.

Distribution of Workload:

Theory: 04 lectures per week

Practical: 02 lectures per week per batch of 20 students

Units Prescribed for Theory:

Unit 5: Group Discussion

Topics:

Preparing for a Group Discussion

Initiating a Discussion

Eliciting Opinions, Views, etc.

Expressing Agreement/ Disagreement

Making Suggestions; Accepting and Declining Suggestions

Summing up.

Unit 6: Business Correspondence

Topics:

Writing Memos, e-mails, complaints, inquiries, etc.

Inviting Quotations

Placing Orders, Tenders, etc.

Unit 7: English for Negotiation

Topics:

Business Negotiations

Agenda for Negotiation

Stages of Negotiation

Unit 8: English for Marketing

Topics:

Describing/ Explaining a Product/ Service

Promotion of a Product

Dealing/ bargaining with Customers

Marketing a Product/ Service: Using Pamphlets, Hoardings, Advertisement,

Public Function/ Festival

Practical: Based on the theory units

Reference Books:

- Herekar, Praksh. *Business Communication*. Pune: Mehta Publications, 2007.
- Herekar, Praksh. *Principals of Business Communication*. Pune: Mehta Publications, 2003.
- John, David. *Group Discussions*. New Delhi: Arihant Publications.
- Kumar, Varinder. *Business Communication*. New Delhi: Kalyani Publishers, 2000.
- Pardeshi, P. C. *Managerial Communication*. Pune: NiraliPrakashan, 2008.
- Pradhan, N. S. *Business Communication*. Mumbai: Himalaya Publishing House, 2005
- Rai, Urmila& S. M. Rai. *Business Communication*. Mumbai: Himalaya Publishing House, 2007.
- Sethi, Anjane&BhavanaAdhikari. *Business Communication*. New Delhi: Tata McGraw Hill.
- Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication, 2008.

SKILL BASED PAPERS :**Paper –VI: Traditional Events**

Name of Course Teacher:	Mr. Mangesh Vilasrao Khole
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of object motion , light traveling and reflection of light
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand proper use for photography of ambience light	1
CF107.2	Understand to creating light for self creativity of their work	2
CF107.3	Develop the motion sense and create proper exposure	2
CF107.4	Understand Light Physics for creativity	4

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PasdfhO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	2	-	-	-	-	-	-	-	-	-
CF107.3	-	1	-	-	-	-	-	-	-	-	-
CF107.4	-	-	1	-	-	-	-	-	-	-	-

Course Contents :

1. Highlight & Shadow
2. Motion Blur Picture
3. Reflection
4. ND Filter (Natural Density)
5. Ambiance Direction & reflection

6. Light Sensitivity
7. Indoor Light Direction & reflection
8. High speed synchronization

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Photography	Dr. Jitendra Kater	Generic-2011	-	2015
2	Digital Photography-Camera & Photography	Dr. Jitendra Kater	Generic-2011	-	2015
3	Western Maharashtra	Raman Kulkarni	Maharashtra Ecotourism Development Board, Nagpur		2018
4	The Beginner Photography Guide	D.K.	Dorling Kindersley ltd.	-	2016

Paper –VII: Corporate Events

Name of Course Teacher:	Mr. Mangesh Vilasrao Khole
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge of basic techniques of arrangements of light and there reflections
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand creating glamour, split, butterfly light, rembrandt light, Rim light, High Key & Low Key .	1
CF107.2	Understand the colors of light and creating innovative image frame.	1
CF107.3	Study the flexible setting of various cameras for photography .	2
CF107.4	Use techniques for solving problem during photography.	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	3	-	-	-	-	-	-	-	-	-	-
CF107.3	-	1	-	-	-	-	-	-	-	-	-
CF107.4	-	-	2	-	-	-	-	-	-	-	-

Course Contains :

1. Flat Light
2. Split Light
3. Rim Light
4. Rembrandt Light
5. Butterfly Light
6. Key Light
7. Fill Light
8. High Key
9. Low Key
10. 8 by 8 Formula

11. 16 by 16 formula

12. Outdoor Motion picture

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Photography	Dr. Jitendra Kater	Generic-2011	-	2015
2	Digital Photography-Camera & Photography	Dr. Jitendra Kater	Generic-2011	-	2015
3	Western Maharashtra	Raman Kulkarni	Maharashtra Ecotourism Development Board, Nagpur		2018
4	The Beginner Photography Guide	D.K.	Dorling Kindersley ltd.	-	2016

Paper –VIII: Photo Editing

Name of Course Teacher:	Mr. Akshaykumar Satappa Khot
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of elements and principles in Photography editing
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand the art Photography and using as per necessary filters.	1
CF107.2	Know all details in light and shadows and manage proper combination of light.	2
CF107.3	Understand types of perspective of object. and making proper lens correction	2
CF107.4	Use perspective in various designs, action, created by using Photoshop Software	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	1	-	-	-	-	-	-	-	-	-
CF107.3	-	1	-	-	-	-	-	-	-	-	-
CF107.4	-	-	2	-	-	-	-	-	-	-	-

Course Content :

1. ID packaging
2. Sizing
3. Color Correction
4. Level Control
5. Action
6. Plug-in
7. Filter

Vivekanand College, Kolhapur (Autonomous)

DEPARTMENT OF GEOGRAPHY

POST GRADUATE DIPLOMA

In GEOINFORMATICS

2022-2023

Onwards

Program Outcomes:

- 1) Explain the scope of the Geography.
- 2) Develop scientific thinking for analyzing environmental issues.
- 3) Understand the new trends in Geographical studies.
- 4) Understand the Geographical issues of local to global level with reference to resources.
- 5) Develop the knowledge and thinking power for solution for Geo-environmental Problems.

Structure of Postgraduate Diploma in Geoinformatics

Program Pattern: Annual Examination

Course Code	Theory/ Practical	Course Title	Marks	Credits
PGD-1	Theory	Fundamentals of GIS	100	4
PGD-2	Theory	Fundamentals of RS and Photogrammetry	100	4
PGD-3	Theory	Principles of Computer and Programming	100	4
PGD-4	Practical	Digital Cartography, Spatial Analysis and modeling	100	4
PGD-5	Practical	Advanced Remote Sensing, GIS and Digital Image Processing	100	4
PGD-6	Practical	Project and Internship	100	4

NATURE OF THE QUESTION PAPER

Total Marks 80

Q.1 A) Multiple choice questions.	10
B) Answer in one or two sentences.	10
Q.2 A) Long answer type question.	20
B) Long answer type question.	
Q.3 A) Long answer type question.	20
B) Long answer type question	
Q.4 Short Note (any 4 out of 5)	20
Internal Marks :	20

FACULTY INVOLVED IN TEACHING THE COURSE:

Sr. no	Name	Qualification	Designation
1	Dr. G. S. Ubale	M.A., NET, SET, Ph. D. Diploma in Geo-informatics	Coordinator, Asst. Professor
2	Dr. S. S. Kale	M.A., NET, Ph. D.	
3	Mr. Sunil Bhosale	M. A. SET, GIS	Asst. Professor
4	Ms. Aishwarya Hingmire	M.A., SET, Diploma in Geo-informatics	Asst. Professor

Syllabus

Course Title: Fundamental of Geographic Information system and GPS

Course Code: PGD-1

Credits: 04

Marks: 100

Course Outcome

- 1) The course focuses on the fundamentals Geographical Information System, and GPS
- 2) Students will demonstrate proficiency and conceptual understanding in using software and automated techniques.
- 3) Students will to carry out thematic maps and analysis through a series of laboratory exercises and creation of reports.

Module No.	Module Title	Credits
I	Introduction to GIS <input type="checkbox"/> History and development <input type="checkbox"/> Data models: vector and raster <input type="checkbox"/> Data type, structure, Spatial and attribute, point, line, polygon- arc, nodes, vertices, <input type="checkbox"/> . Futre og trends of GIS.	1
II	Spatial data inputs <input type="checkbox"/> Digitization <input type="checkbox"/> Error identification <input type="checkbox"/> Types and sources of error <input type="checkbox"/> Correction editing and topology building	1
III	Introduction to GPS <input type="checkbox"/> History of Positioning System GPS System Description, Error Sources & Receiver <input type="checkbox"/> Introduction to DGPS and Total Station, GPS Performance and Policy Applications <input type="checkbox"/> Introduction to open source GIS	1
IV	Introduction to AutoCAD	1

Reference Books:

1. Bolstad, P. (2005) GIS Fundamentals: A first text on Geographic Information Systems, Second Edition. White Bear Lake, MN: Eider Press, 543 pp.
2. Burrough, P.A. and McDonnell, R.A. (1998) Principles of geographical information systems. Oxford University Press, Oxford, 327 pp.
3. Campbell, J.B. (2002). Introduction to remote sensing, 3rd ed., The Guilford Press. ISBN 1-

57230-640-8.

4. Chang, K. (2007) Introduction to Geographic Information System, 4th Edition. McGraw Hill.

5. Curran Paul J Principles of Remote Sensing UK: ELBS,

6. Elangovan, K (2006) GIS: Fundamentals, Applications and Implementations. New India Publishing Agency, New Delhi"208 pp.

7. Heywood, I., Cornelius, S., and Carver, S. (2006) An Introduction to Geographical Information Systems. Prentice Hall. 3rd edition.

8. Jensen, J.R. (2000). *Remote sensing of the environment: an Earth resource perspective*. Prentice Hall. ISBN 0-13-489733-1

Course Title :Fundamentals of RS and Photogrammetry

Course Code: PGD-2

Credits: 04

Marks: 100

Course outcome

- 1) Students will be able to understand the concept of remote sensing and EMR.
- 2) Students will of be able to understand fundamental physical principles of remote sensing.
- 3) Students will of be able to understand visual interpretation and digital image processing exercises.

Module No.	Module Title	Credits
I	Fundamental of Remote Sensing <input type="checkbox"/> Introduction, History, development, <input type="checkbox"/> stages of remote sensing, EMR & EMR spectrum, EMR Quantities, Energy sources and radiation principles, <input type="checkbox"/> Theories of EMR, Concept of Energy interactions in the atmosphere, energy Black body, atmospheric windows <input type="checkbox"/> types of remote sensing interactions with the earth surface features, Spectral reflectance of vegetation, Soil and water,	1
II	Platform, Orbit and sensor <input type="checkbox"/> Platform: Ground based, air-borne, space-borne, <input type="checkbox"/> Orbit: Geostationary satellite and polar orbiting satellite, Sensor: <input type="checkbox"/> Types of sensor and cameras, processes of sensor & its characteristics, Whiskbroom and Push broom cameras	1
III	Techniques of interpretation <input type="checkbox"/> Aerial photo interpretation, satellite image interpretation, <input type="checkbox"/> Recognition elements: Tone, Color, Texture, Pattern, Shape, Size and associated features	1
IV	Aerial photography <input type="checkbox"/> Types, Geometry, Scale, Height and Process of Aerial Photograph, <input type="checkbox"/> basic requirement of Aerial Photograph, planning & execution of photographic flight, aerial cameras, relief displacement, <input type="checkbox"/> stereo vision, stereo model & stereoscope, parallax & parallax measurement	1

References books

1. Campbell, J.B. (2002). *Introduction to remote sensing*, 3rd ed., The Guilford Press. ISBN 1-57230-640-8.

2. Curran Paul, J. (1984) Principles of Remote Sensing UK: ELBS.

3. Joseph, George (2007) Fundamentals of Remote Sensing Universities Press India

4. Lillesand, T.M.; R.W. Kiefer, and J.W. Chipman (2007). *Remote sensing and image interpretation*, 5th ed., Wiley. ISBN 0-471-15227-7.

5. Moffitt, F. H. (1980). Photogrammetry. 3rd Ed, Harper & Row, NY.

6. Sabins Floyd F Remote Sensing: Principles and Interpretation New York: WH Freeman and Company
7. Wolf, P. R. (1983). Elements of Photogrammetry. McGraw-Hill, NY.
8. Zorn, H. C. (1980). Introductory Course in Photogrammetry. 6th Ed. ITC, Netherlands

Course Title: Principles of computers and computer programming

Course Code: PGD- 3

Credits: 04

Marks:100

Course objective

- 1) Students will demonstrate the Application of computer in the field of GIS, DBMS
- 2) Students will understand the introduction to computers-DBMS, basics of programming languages.
- 3) Students will demonstrate proficiency and conceptual understanding in data creation and storage.
- 4) To carry out geographical data for developing and designing application and use of Programming in GIS.

Module No.	Module Title	Credits
I	Introduction to Computers <input type="checkbox"/> Hardware and Software, System requirement, configuration and operating systems and Computer Applications <input type="checkbox"/> Algorithms and Programming in Computers <input type="checkbox"/> MS ACCESS and applications	1
II	Introduction to simple programming in C <input type="checkbox"/> Developing programming techniques and solutions for spatial algorithms and problem-solving using VB <input type="checkbox"/> Getting started with HTML, flash	1
III	Introduction to Python	1
IV	Application of Computer and Python in Geography	1

Reference Books:

1. Benjamin C. Pierce (2002). Types and Programming Languages, The MIT Press.
2. Bruce J. MacLennan (1999). Principles of Programming Languages: Design, Evaluation, and Implementation, Oxford University Press.
3. Daniel P. Friedman and Mitchell Wand (2001). Christopher Thomas Haynes: Essentials of Programming Languages, the MIT Press.
4. David Gelernter and Suresh Jagannathan (1990). Programming Linguistics, The MIT Press.
5. Goldschlager, L. (1998). A Lister Computer Science - a modern Introduction Prentice Hall, 1988.
6. John C. Mitchell (2002). Concepts in Programming Languages, Cambridge University Press.
7. Michael L. Scott (2005). Programming Language Pragmatics, Morgan Kaufmann Publishers.
8. Ravi Sethi (1996). Programming Languages: Concepts and Constructs, 2nd ed., Addison-Wesley.

Course Title: Digital of Cartography, Spatial Analysis and Modeling

Course Code: PGD- 4

Credits: 04

Marks: 100

Course outcome

- 1) Students will understand different types of projections and datum used in various locations.
- 2) Students will demonstrate conceptual understanding in using Manual and carry out thematic maps.
- 3) Students will demonstrate the art, science, and technologies of cartography and Photogrammetry.
- 4) Students will understand to develops the ability to understand how maps are created traditionally and digitally

Module No.	Module Title	Credits
I	Introduction to Cartography <ul style="list-style-type: none"> <input type="checkbox"/> Basics of Map <input type="checkbox"/> Fundamentals of direction, scale, types, sources <input type="checkbox"/> Elementary geodesy- Datum and Projection <input type="checkbox"/> Projection coordinates <input type="checkbox"/> WGS 84 	1
II	Geographic representation <ul style="list-style-type: none"> <input type="checkbox"/> Map and mapping, map design, symbolization, conventional signs <input type="checkbox"/> map layout, map referencing and indexing, scale of maps and map contents <input type="checkbox"/> Field work techniques, socio – economic survey and attribute data. 	1
III	Introduction to analysis. <ul style="list-style-type: none"> <input type="checkbox"/> Significance of spatial analysis, overview of tools for analysis Spatial analysis of Vector Base <ul style="list-style-type: none"> <input type="checkbox"/> Overlay operations: point in polygon, line polygon, polygon in polygon, Single layer operations, features identification, extraction, classification and manipulation, Multilayer operations: union, Intersection, difference Spatial analysis of raster base <ul style="list-style-type: none"> <input type="checkbox"/> Map algebra, grid based operations, local, focal, zonal and global functions, cost surface analysis, optimal path and proximity search. 	1
IV	Network Analysis- Concept of network analysis, Types of network analysis, Evaluation of network complexity using Alpha, Gama indices, Network data model <ul style="list-style-type: none"> <input type="checkbox"/> Point pattern- Method for evaluating point patterns, Clustered and random distribution <input type="checkbox"/> Surface analysis- Interpolation method, DEM, TIN, variance filter, slope and aspect, relief and hill shading 	1

Reference Books:

1. Alias A. Rahman and Morakot Pilouk (2008) Spatial Data Modeling for 3D GIS, Springer New York
2. Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W. (2005). Geographic Information Systems and Science. Chichester: Wiley. 2nd edition.
3. Ott, T. and Swiaczny, F. (2001). Time-integrative GIS. Management and analysis of spatio-temporal data. Berlin / Heidelberg / New York: Springer.
4. Thurston, J., Poiker, T.K. and J. Patrick Moore. (2003). Integrated Geospatial Technologies: A Guide to GPS, GIS, and Data Logging. Hoboken, New Jersey: Wiley.
5. M Goodrich (2000). Data Structures and Algorithms in Java, 2nd Edition Wiley.
6. Malczewski, J. (1999). GIS and Multicriteria Decision Analysis. New York: John Wiley and Sons

7. GIS and Multi-criteria Analysis by Makrewski Jacek, USA, 1999.
8. Principals of GIS by Burrough P.A. MacDonneli R.A. published by Oxford University Press, 2000.
9. Geographical Information Science, vol. I by Roy P.S. Published by IIRS, 2000.
10. Fundamentals of Geographic Information Systems, 2nd Edition by Demers M.N. published by John Wiley & Sons 2000

Course Title: Advanced Remote Sensing, GIS and Digital Image Processing

Course Code: PGD- 5

Credits: 04

Marks: 100

Course outcome

- 1) Students will be able to apply mathematical relationships describing fundamental physical, geometric, and computational principles relevant to remote sensing and GIS.
- 2) Students will understand the Remote sensing application in environmental problems.
- 3) Students will be able to provide an opportunity to understand and work with latest developments.

Module No.	Module Title	Credits
I	Advanced Remote Sensing and GIS <input type="checkbox"/> Microwave Remote Sensing <input type="checkbox"/> Thermal Remote Sensing <input type="checkbox"/> Hyper spectral Remote Sensing <input type="checkbox"/> LiDAR & Drone Participatory GIS and Mobile GIS <input type="checkbox"/> WebGIS (ArcIMS, MapServer, Geomedia, MapGuide) <input type="checkbox"/> GIS servers, Intermediate softwares and Distributed GIS systems	1
II	Multi-criteria decision making analysis – <input type="checkbox"/> Ranking <input type="checkbox"/> Rating <input type="checkbox"/> Pair wise comparison	1

III	<p>Introduction to Digital Image Processing</p> <ul style="list-style-type: none"> <input type="checkbox"/> Visual perception, Image sensing and acquisition, <input type="checkbox"/> Digital Data Formats Image sampling and Quantization <input type="checkbox"/> Basic relationship between pixels. <input type="checkbox"/> Development, scope and fundamental steps involved in Digital Image Processing, components of Image Processing <p>Image Rectification</p> <ul style="list-style-type: none"> <input type="checkbox"/> Radiometric and Atmospheric Correction <input type="checkbox"/> Geometric Correction, Ortho-rectification, calibration and rectification of photo and images, <input type="checkbox"/> Image enhancement in spatial domain and frequency domain, Filtering, Fourier Transform, Noise removal 	1
IV	<p>Multispectral Image Processing</p> <ul style="list-style-type: none"> <input type="checkbox"/> Colour Image processing, slicing, Image compression, dilation, Segmentation, Spectral rationing, density slicing and image fusion <input type="checkbox"/> Object recognition, classification, object recognition, feature extraction, accuracy, assessment, change detection Accuracy Assessment and integration with GIS 	1

Reference Books:

1. Burger, Wilhelm; Mark J. Burge (2007). Digital Image Processing: An Algorithmic Approach Using Java. Springer. ISBN 1846283795.
2. Campbell, J.B. (2002). Introduction to remote sensing, 3rd ed., The Guilford Press. ISBN 1-57230-640-8.
3. Damen MCJ, Sicco Smith G and Kerstappen(Ed) (). Remote Sensing for Resources Development and Environmental Management 3rd.volume Set Netherlands: Balkema
4. Gonzalez, Rafael C.; Richard E. Woods (1992). Digital Image Processing. ISBN 0-201-50803-6.
5. Jensen John R (2007). Introductory Digital Image processing: Remote Sensing Perspective New Jersey: Prentice Hall
6. Joseph, George (2007). Fundamentals of Remote Sensing Universities Press India
7. Lillesand, T.M.; R.W. Kiefer, and J.W. Chipman (2007). Remote sensing and image interpretation, 5th ed., Wiley. ISBN 0-471-15227-7.
8. Pratt, William K. (1978). Digital Image Processing. ISBN 0-471-01888-0.
9. Romeny, Bart M. (2003). Front-End Vision and Multi-Scale Image Analysis. ISBN1-4020-1507-0.
10. Umbaugh, Scott E (2005). Computer Imaging: Digital Image Analysis and Processing. ISBN 0-84-932919-1.

‘ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार’

-शिक्षणमहर्षि डॉ बापूजी साळुंखे

श्री स्वामी विवेकानंद शिक्षण संस्था संचलित,
विवेकानंद कॉलेज (स्वायत्त), कोल्हापुर

हिंदी विभाग
वर्ष 2022-2023

हिंदी अनुवादका पाठ्यक्रम (PG Diploma in Hindi Translation)

पेपर क्र 1- अनुवाद सिद्धांत और प्रविधि

उद्देश्य:

1. अनुवाद के महत्त्व से विद्यार्थियों को परिचित कराना।
2. अनुवाद कौशल्य को विद्यार्थियों में विकसित करना।
3. अनुवाद के माध्यम से भाषा कौशल्य का विकास करना।
4. अनुवाद के प्रयोग को बढ़ावा देने का प्रयास
5. राजभाषा के महत्त्व एवं वर्तमान स्थिति से विद्यार्थियों को अवगत कराना।
6. अंतरानुशासनात्मक अध्ययन के प्रति रुझान पैदा करना।

इकाई 1: अनुवाद सैद्धांतिक विवेचन

'अनुवाद अर्थ, स्वरूप एवं परिभाषा

इकाई 2: अनुवाद की प्रक्रिया और प्रकार

क) अनुवाद की प्रक्रिया

अ) स्रोत भाषा और लक्ष्य भाषा का सामान्य परिचय

आ) अनुवाद की प्रक्रिया के विविध सोपान

इ) अनुवादक के गुण, दायित्व और अपेक्षाएँ

ख) अनुवाद के प्रकार- शब्दानुवाद, भावानुवाद, छायानुवाद, सारानुवाद, आशु अनुवाद, आदर्शानुवाद, साहित्यिक और साहित्येतर अनुवाद, वैज्ञानिक और तकनीकी अनुवाद, मशीनी अनुवाद।

इकाई 3: राजभाषा हिन्दी संवैधानिक स्थिति व अनुवाद

1. राजभाषा हिन्दी की संवैधानिक स्थिति

- राजभाषा से जुड़े अनुच्छेद 343 से 351 तक संविधान द्वारा स्वीकृत भाषा नीति
- राष्ट्रपति के आदेश तथा हिन्दी के विविध स्तरीय प्रयोग 1952 तथा 1955 -संसदीय राजभाषा समिति – 1957, राजभाषा आयोग – 1955, राजभाषा अधिनियम 1963, राजभाषा (संशोधन) अधिनियम 1967
- राजभाषा हिन्दी की वर्तमान स्थिति

2. अनुवाद : आवश्यकता एवं महत्त्व

इकाई 4: अनुवाद समस्याएँ एवं समाधान

- साहित्यिक अनुवाद से जुड़ी समस्याएँ एवं उनका समाधान
- साहित्येतर अनुवाद से जुड़ी समस्याएँ एवं उनका समाधान
- सांस्कृतिक संदर्भों के अनुवाद की समस्याएँ एवं समाधान
- लिप्यंतरण: समस्याएँ एवं समाधान
- लोकोक्तियों एवं मुहावरों के अनुवाद की समस्याएँ एवं समाधान
- मानक वर्तनी लेखन की समस्याएँ एवं अनुवाद

• प्रश्नपत्र का स्वरूप एवं अंक विभाजन

अनुवाद : सैद्धान्तिक एवं प्रविधि के प्रश्नपत्र का प्रारूप एवं अंक विभाजन का विवरण
वार्षिक परीक्षा कुल अंक 100

प्रश्न 1 पूरे पाठ्यक्रम पर 20 वस्तुनिष्ठ प्रश्न अंक - 20

प्रश्न 2 विभाग एक पर दीर्घोत्तरी प्रश्न आंतरिक विकल्प के साथ अंक - 20

प्रश्न 3 विभाग दो पर दीर्घोत्तरी प्रश्न आंतरिक विकल्प के साथ अंक - 20

प्रश्न 4 • विभाग तीन पर दीर्घोत्तरी प्रश्न आंतरिक विकल्प के साथ अंक - 20

प्रश्न 5- विभाग चार पर दीर्घोत्तरी प्रश्न आंतरिक विकल्प के साथ अंक - 20

• संदर्भ ग्रंथ -

1. गोपीनाथन जी - अनुवाद : सिद्धान्त एवं प्रयोग 2001, लोकभारती प्रकाशन, इलाहाबाद।
 2. रमेश चंद्र - व्यावहारिक अनुवाद कला, 1998, नीलकंठ प्रकाशन, नई दिल्ली।
 3. भोलानाथ तिवारी- अनुवाद विज्ञान सिद्धान्त एवं प्रविधि 2009, किताबघर, नई दिल्ली।
 4. सुरेश कुमार अनुवाद सिद्धान्त की रूपरेखा 2005, वाणी प्रकाशन, नई दिल्ली।
 5. कुसुम अग्रवाल - अनुवाद शिल्प समकालीन संदर्भ -2008, साहित्य सहकार, दिल्ली।
 6. विनोद गोदरे-प्रयोजनमूलक हिन्दी - पहला संस्करण-2001, वाणी प्रकाशन, दरियागंज, दिल्ली।
 7. डॉ. तिवारी भोलानाथ, अनुवाद विज्ञान, शब्दकार प्रकाशन, नई दिल्ली, 1972
 8. डॉ. अय्यर विष्णुनाथ, अनुवाद कला, प्रभात प्रकाशन, नई दिल्ली, 1982
 9. डॉ. राजूरकर म.ह. डॉ. बोरा राजमल (संपा.) अनुवाद क्या है ? वाणी प्रकाशन, नई दिल्ली, 1993
 10. डॉ. भाटिया कैलाष अनुवाद कला सिद्धान्त और प्रयोग, तक्षपिला प्रकाशन, 1985
 11. गुप्त गार्गी, अनुवाद बोध, भारतीय अनुवाद परिषद, 1984
 12. पालीवाल, रीतारानी, अनुवाद प्रक्रिया, साहित्य निधि प्रकाशन, 1982
 13. पालीवाल, रीतारानी, अनुवाद की सामाजिक भूमिका, सचिन प्रकाशन, 1991
- 1964

प्रश्नपत्र 2 अनुवाद: अनुप्रयोग एवं व्यावहारिक अनुवाद कार्य

उद्देश्य

1. अनुवाद कौशल्य को विद्यार्थियों में विकसित करना।
2. अनुवाद के माध्यम से भाषा कौशल्य का विकास करना।
3. अनुवाद के प्रयोग को बढ़ावा देने का प्रयास
4. अनुवाद से जुड़े रोजगार के प्रति विद्यार्थियों को जागरूक करना।
5. राजभाषा के महत्त्व व वर्तमान स्थिति से विद्यार्थियों को अवगत कराना। कार्यालयीन हिन्दी व अनुवाद के विकसित रूप से विद्यार्थियों को परिचित कराना।
6. मशीनी अनुवाद से जुड़ी संभावनाओं व सीमाओं से विद्यार्थियों को अवगत कराना।

इकाई 1: कार्यालयीन हिन्दी अनुवाद

पारिभाषिक शब्दावली एवं वाक्यांश का अनुवाद एवं कार्यालयीन सूचना परिपत्र, पत्रलेखन, टिप्पण आदि का व्यावहारिक अनुवाद।

इकाई 2 : व्यावसायिक एवं वाणिज्यिक क्षेत्र में अनुवाद

रेलवे, बीमा, बैंक, डाक, फिल्म पटकथा एवं संवाद संबंधी अनुवाद, विविध प्रसार माध्यमों में प्रयुक्त पारिभाषिक शब्दावली / वाक्यांशों का परिचय एवं व्यावहारिक अनुवाद

इकाई 3 वैज्ञानिक एवं तकनीकी क्षेत्र में अनुवाद

वैज्ञानिक एवं तकनीकी क्षेत्र में प्रयुक्त शब्दों / वाक्यांशों का परिचय एवं व्यावहारिक अनुवाद, मानक वर्तनी एवं प्रूफशोधन का परिचय।

इकाई 4: मशीनी अनुवाद

मशीनी अनुवाद - मानवसाधित मशीनी अनुवाद, मशीन साधित मानव अनुवाद, पूर्ण मशीनी अनुवाद और आंशिक मशीनी अनुवाद, मशीनी अनुवाद की सीमाएँ और संभावनाएँ।

• प्रश्नपत्र का स्वरूप एवं अंक विभाजन

अनुवाद: अनुप्रयोग एवं व्यावहारिक अनुवाद कार्य के प्रश्नपत्र का प्रारूप एवं अंक विभाजन का विवरण

वार्षिक परीक्षा फुल अंक 100

प्रश्न 1. पूरे पाठ्यक्रम पर 20 वस्तुनिष्ठ प्रश्न अंक - 20

प्रश्न 2. विभाग एक पर दीर्घोत्तरी प्रश्न आंतरिक विकल्प के साथ अंक - 20

प्रश्न 3. विभाग दो पर दीर्घोत्तरी प्रश्न आंतरिक विकल्प के साथ अंक - 20

प्रश्न 4. विभाग तीन पर दीर्घोत्तरी प्रश्न आंतरिक विकल्प के साथ अंक - 20

प्रश्न 5. विभाग चार पर दीर्घोत्तरी प्रश्न आंतरिक विकल्प के साथ अंक - 20

• संदर्भ ग्रंथ

1. विनोद गोदरे- प्रयोजनमूलक हिंदी, पहला संस्करण 2001, वाणी प्रकाशन, दरियागंज, दिल्ली।
2. कृष्ण कुमार गोस्वामी-प्रयोजन मूलक भाषा और कार्यालयी हिन्दी, कलिंगा प्रकाशन, दिल्ली।

3. कैलाशचंद्र भाटिया कामकाजी हिन्दी - वाणी प्रकाशन, दिल्ली।
4. कैलाशचंद्र भाटिया - राजभाषा हिन्दी - वाणी प्रकाशन, दिल्ली ।
5. गोपीनाथ श्रीवास्तव सरकारी कार्यालयों में हिन्दी का प्रयोग लोकभारती, इलाहाबाद ।

प्रश्नपत्र 3 अनुवाद परियोजना कार्य

कुल अंक 100%

1. परियोजना कार्य टंकित 30 पृष्ठ अंक: 75

1.1 साहित्यिक अनुवाद

1.2 साहित्येतर अनुवाद

(कार्यालयीन, वाणिज्य, व्यावसायिक, वैज्ञानिक, तकनीकी सामग्री का अनुवाद) 2. संगोष्ठी : हिंदी

अनुवाद पदविका पाठ्यक्रम पर आधारित एक सेमिनार अंक 25

उपर्युक्त क्षेत्रों से संबद्ध प्रायोगिक अनुवाद (अंग्रेजीसे हिन्दी में अथवा हिन्दी से अंग्रेजी में)। परियोजना कम से कम 20 पृष्ठों की हो जिसे पूरे पाठ्यक्रम अवधि के दौरान किया जाए।

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

1 Title: Diploma in Hindi Translation

2. Deration of the Course: One academic year

3. Admission Condition

a. Graduate from any statutory Indian University

4. Intake: 30

5. Teachers Qualification:

Any recognized PG teacher in Hindi is eligible

6 Standard of Passing

i) Minimum passing for each paper will be 30% marks & aggregate passing for the whole course be 40% marks

ii) Candidate securing 50% marks in each paper shall be exempted for reappearing for the examination

iii) The division shall be awarded as follows

a) 50% marks and above but upto 59% marks-Second Class

b) 60% marks and above but %% marks-First Class

c) 70% marks and above-First Class with Distinction

7. Total Papers

Course will consist of 3 papers of 100 murks cach

Paper No. Name of the paper

I) अनुवाद: सिद्धांत और प्रविधि

(Translation: Theory & Methodology)

II) अनुवाद: अनुप्रयोग एवं व्यावहारिक

(Translation: Applied & Practical)

III) अनुवाद: प्रायोगिक कार्य

(Translation: Practical Werk)

(Details will available in the Syllabes)

8. Teaching Period.

Three periods for each paper in a week (of 60 min, duration)

9. Fees:

Rs. 5000/- per year

10. Examination Fees:

Examination fees will be Rs. 300

11. Attendance: As per University rules.

12. Remuneration:

- परियोजना कार्य के लिए को पति परियोजना 250/- दिया जाए।
- समन्वयक का पारिश्रमिक प्रतिवर्ष 5000/- हों।

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

Diploma in Hindi Translation DISCIPLINARY RULES

For purpose of Section 95 (5) of the Maharashtra University Act, 1994 the rules of discipline and proper conduct for the students of the University Department, affiliated colleges, recognized institutions, autonomous colleges/institutions shall be as follows:

1. As part of discipline, students are required to attend function celebrating Days of National Importance

2. a) The students shall attend the classes, practical's and seminars etc. Wherever prescribed regularly so that the requirements of minimum attendance as prescribed under the Act, the Statutes, the ordinances and rules/regulations made in that

behalf are fulfilled. The students shall not remain absent for more than 3 days without permission of the Head

of the concerned Department. 3. It shall be binding on the part of the students to see that no damage is done to the property of the

concerned institution in any manner. 4.) The students shall behave with their classmates, teachers authorities and

the non teaching employees of the concerned institutions in a responsible manner.

ii) The students shall behave in a fair and friendly manner in all extra co-curricular activities.

(B) The students shall participate in Educational tours, Youth Festivals and other collective activities wherever prescribed, in a constructive manner ensuring fulfillment of the objectives of the said activity under strict supervision and guidance of the teachers officers authorities of the concerned institutions.

iv) It shall be obligatory on the part of the students to make a proper use of the Laboratory/Library/Study Room and other common facilities without causing

inconvenience or damage to the other users and the property.

5. The residents students shall be governed by the rules and regulations in respect of hostel accommodation/premises as prescribed by the concerned institutions.

6. The students involved in any attempts of common offs, vulgarism, gundaism, manhandling, malpractices or participation in criminal acts shall be liable for punishment.

7. The students shall be governed by the provisions of Anti-raging Legislation of the State Government, and of rules made in this regard from time to time by the concerned institutions

8. Any breach of the aforesaid rules or any misbehaviour on the part of the student shall be liable to be punished severely in accordance with the provisions contained in Section 95 (3) (4) of the Maharashtra Universities Act, 1994 reproduced below:

95 (3) The Vice-Chancellor may, in exercise of his powers, by order, direct that any student or students be expelled or rusticated for a specified period or be not admitted to a course or

courses of study in a college, institutions or department of the university for a specific period or department of the fine, not exceeding three hundred rupees or be debarred from taking an examination or examinations conducted by the department, colleges or institution maintained by the university for a specified period not exceeding five years or that result of the student or students concerned in the examination in which he or they have appeared be cancelled. Provided dut, the Vice-Chancellor shall have reasonable opportunity to the student concerned of being heard, if expulsion is for a period exceeding one year.

95 (4) Without prejudice to the powers of the Vice-Chancellor, the Principal of conducted Colleges, Heads of the University Institutions and the Heads of Department of the University shall have authority to exercise all such powers over the students in their respective charge as may be necessary for the maintenance of proper discipline.

Cancellation of admission and refund of money shall be as under:

All Deposit such as Caution Money, Library, Laboratory deposit etc. shall be refundable subject to such deduction as may be necessary on account of any damage to the property of the institution concerned such as breakages to laboratory equipment, loss of library books etc. for which a student may be responsible.

The application for refund of such deposits shall be within six months either from the date he/she leaves the college or completes the course.

VIVEKANAND COLLEGE, KOLHAPUR
(AUTONOMOUS COLLEGE)

Board of Studies in Foundry Technology

Choice Based Credit System Pattern

Syllabus

For

Community College (Diploma)

Diploma in Foundry Technology

(To be implemented from the academic year 2018-2019)

COMMUNITY COLLEGE (C. C)

STRUCTURE OF SYLLABUS:

To be implemented from the academic year 2018-2019

1. Title of the course: COMMUNITY COLLEGE (FOUNDRY TECHNOLOGY)

A. INTRODUCTION

The proposed curriculum is with the view to make it more contextual, industry affable and suitable to cater the needs of society and nation in present day context. The committee examined the nature of the existing syllabus of various courses in foundry technology and after analysing other curricula of existing universities in respective subjects in terms of content, relevance, quality and pattern of teaching and examination, has synthesized the present proposal. After guidance from industry professionals, consultants and senior faculty, feedbacks from the core faculty and intensive discussions the syllabus is suitably finalized.

The syllabus needs revision in terms of preparing the student for the professional scenario with relevance to practical needs and requirements. A holistic approach includes providing industry training via on job training/internships, handling live projects, visits to foundry units. Regular expert's interaction will help to build a bridge between students and industry.

Technical advancement is the key to a substantial teaching system in today's world and thus a great responsibility lies on the curriculum to prepare students to rise to meet global standards and align seamlessly to changing trends.

B. RATIONALE

Casting process is an art and need to be developed to fulfill the requirement of the global market. The skill of casting will provide us the better quality of automobile, agricultural and heavy engineering cast components. In recent days, Foundry sectors are lacking skilled employees in Pattern making, Molding, Melting and Fettling. This curricular area aims at enabling the students to develop their skills of these different foundry sections.

In today's world of competition, the rejection control has become the key factor in the foundry industry. Rejection control benefits the industry in both quality and profit. This control is not possible without skilled employees present in the industry, which makes this course important for the industry.

The Foundry Technology curriculum focuses on building a strong foundation for developing a career in foundry by learning the basic key factors of Pattern making, molding, melting and fettling. Practical orientation of this course strengthens the skills of students and makes them solving the problems of foundry industry.

C.COURSE OBJECTIVES

To enable the students-

- To promote understanding of basic facts and concepts in foundry process while retaining the excitement of foundry industry.
- To make students capable of studying foundry technology in academic and Industrial courses.
- To expose the students to various emerging new areas of foundry technology and apprise them with their prevalent in their future studies and their applications in various spheres of manufacturing technology.
- To develop problem solving skills in students.
- To expose the students to different processes used in Foundry Industries and their applications.
- To develop ability and to acquire the skill and knowledge of terms, facts, concepts, processes, techniques and principles of foundry industries.
- To develop ability to apply the skill and knowledge of contents of principles of foundry technology.
- To inquire of new skill and knowledge of foundry technology and developments therein.
- To expose and to develop interest in the fields of foundry technology.

D.CORE CONTENT GOALS FOR FOUNDRY TECHNOLOGY

The students will learn:

- Basics of molding, pattern making, melting and fettling.
- Key factors behind accurate pattern construction
- Principles of Melting furnaces
- Study of Charge calculations
- The basics of different molding operations.
- The advanced molding processes.
- The principles of fettling.
- About career options in foundry industry.
- To improve their skills and techniques through practicals and projects.
- To learn problem solving techniques.

In this class, students will learn the basic theory behind all the foundry operations. The Practical part of course will make them confident to work on shop floor. They will demonstrate the processes as expected by the teacher. They are expected to maintain facilities in an appropriate working condition.

2. Duration:

The duration of the Community college. Course will be of **one years**.

- **Community college - Diploma in Foundry Technology**

The final B.Voc degree will be awarded only after completion of three years course. The suggested credits for each of the years are as follows:

Awards		Normal calendar duration	Skill Component Credits	General Education Credits
Year 1	Diploma in Foundry Technology	Two Semesters	36	24
TOTAL			36	24

General Education Component should not exceed 40% of the total curriculum.

Credits can be defined as the workload of a student in

1. Lectures
2. Practicals
3. Seminars
4. Private work in the Library/home
5. Examination
6. Other assessment activities.

The following formula should be used for conversion of time into credit hours.

- a) One Credit would mean equivalent of 15 periods of 60 minutes each, for theory, workshops /labs and tutorials;
- b) For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops;
- c) For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

3. Eligibility:

The eligibility condition for admission to Community college programme shall be **10+2 or equivalent**, in any stream **from any recognized board or university**.

4. Medium of Instruction:

The medium of instruction of the course will be **Marathi/ English**.

5. Pattern: Choice Based Credit System Semester Pattern.

6. Examination:

A. Scheme of examination:

- The semester examination will be conducted at the end of each term (both theory and practical examination)
- Theory paper will be of 50 marks each. The practical examination will be of 150 marks and industrial practical training/project work of 50 marks in the practical.
- Question papers will be set in the view of the entire syllabus and preferably covering each unit of the syllabus.

For each semester there will be five theory papers. Practical Examination will be conducted at the end of every semester.

Paper Number	Title of Paper (For Semester I)	Internal Marks	Theory Exam Marks	Total Marks
AECC-I	Business Communication-I	10	40	50
CC-I	Engineering Graphics-I.	10	40	50
CC-II	Engineering Materials.	10	40	50
CC-III	Pattern Construction Technology	10	40	50
CC-IV	Molding Technology.	10	40	50
TOTAL		50	200	250

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	120	Projects/ Industry Training.	50
2	Journal	15		
3	Oral	15		
Total		150		50

The total weightage of first term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 40 X 5	200
2	Practical Examination.	200
3	Internal Assessment	50
TOTAL		450

B. Nature of question paper:

For each paper there will be **THREE** compulsory questions.

General nature of the question paper will be:

Question Number	Type		Marks
Q.1	Multiple choice question	No internal options.	8
Q.2	Short answer	Any four out of six	16
Q.3	Long answer	Any two out of three	16

C. Standard of Passing:

To pass the examination a candidate must obtain at least 35% (i.e 14 marks out of 40) in individual subjects, in internal assessment and University examination each in all theory and practical subjects.

D. External Students: Not applicable as this is a practical oriented course.

7. University Term: As per academic calendar of the university.

For the Community college i.e. Diploma in Foundry Technology practical examination and theory paper assessment will be done at college level.

8. List of equipment and instruments:

1. Sand Rammer
2. Sand Sampler
3. Rapid moisture content tester.
4. Compactability Tester
5. Permeability Tester.
6. Universal sand testing machine
7. Mold hardness teller.
8. Core Hardness Tester.
9. Sand Muller
10. Sand Grinder

9. Laboratory Safety Equipments:**Part I:** Personal Precautions:

1. Must wear **Lab Aprons / Lab Jacket** and safety shoes.
2. Except in emergency, over – hurried activities is forbidden.
3. Eating, Drinking and Smoking in the laboratories is strictly forbidden.

Part II: Use of Safety and Emergency Equipments:

1. First aid Kits
2. Fire extinguishers (dry chemical and carbon dioxide extinguishers)
3. Management of Local exhaust systems.
4. Sign in register if using instruments.

10. Workload:

Each skill based paper (i.e. Paper no. II, III, IV and V) will have **four theory** periods per week. There are **four practical** per week. Each practical will be of four periods. The practical batch will have maximum 20 students.

The total workload for one batch will be:

1. One Paper on General Education:	=	06 Theory Periods.
2. Three Papers on skill based Education: 3 X 4	=	12 Theory Periods.
3. Five Practical work per week: 5 X 2	=	10 Practical periods.
4. Project Work per batch per week:	=	02 Periods

TOTAL		30 Periods.

Working hours will be 5 hours (300 minutes) per day i.e. six periods each of 50 minutes.

13. MEMORANDUM OF UNDERSTANDING (MOU):

The purpose of this MOU is to clearly identify the roles and responsibilities of each party (i.e. college and industry partner) as they relate to the implementation of the **Community college /B.Voc. Programme in Foundry Technology** at the college.

It is suggested to sign at least **TWO MOU** with the industry partners in the related field.

Community College (Diploma in Foundry Technology) Course structure

General Structure:

The diploma course has two semesters; each one is of 450 marks. There will be five theory papers for each semester having 50 marks each.

SEMESTER – I

- | | |
|--|-------------|
| 1) Paper-I: Business Communication- I | - 50 Marks. |
| 2) Paper-II: Engineering Graphics-I. | - 50 Marks. |
| 3) Paper-III: Engineering Materials. | - 50 Marks. |
| 4) Paper-IV: Pattern Construction Technology | - 50 Marks |
| 5) Paper V- Molding Technology. | - 50 Marks. |

SEMESTER – II

- | | |
|--|-------------|
| 1) Paper-VI: Business Communication-II | - 50 Marks. |
| 2) Paper-VII: Engineering Graphics-II | - 50 Marks. |
| 3) Paper-VIII: Melting Technology | - 50 Marks. |
| 4) Paper-IX: Gating Systems & Riser | - 50 Marks. |
| 5) Paper X: Casting Processes. | - 50 Marks. |

There will be practical examination for each semester. The practical examination will be conducted in **two days** each of six hours. It will be of 150 marks of which 30 marks are reserved for oral and journal. The internal assessment of 50 marks includes industry training via internships, handling live projects, visits to foundry units etc.

SYLLABUS

N. B.

- (i) Figures shown in bracket indicate the total lectures required for the respective units.
- (ii) The question paper should cover the entire syllabus. Marks allotted to questions should be in proportion to the lectures allotted to respective to units.
- (iii) All units should be dealt with S.I. units.
- (iv) **Industrial training / tour / visit per semester is compulsory.**
- (v) Use of recent editions of reference books is essential.
- (vi) Use of Scientific calculator is allowed.

SEMESTER – I

AECC– I: Business Communication-I

Total Workload: 06 lectures per week of 60 mins.

Distribution of Workload:

Theory: 04 lectures per week

Practical: 02 lectures per week per batch of 20 students

Units Prescribed for Theory:

40 Marks.

Unit 1: Use of English in Business Environment

Topics:

Business Vocabulary: Vocabulary for banking, marketing and for maintaining public relations

What is a sentence?

Elements of a sentence

Types of sentence: Simple, compound, complex

Unit 2: Writing a Letter of Application and CV/ Resume

Topics:

Structure of a letter of application for various posts

CV/ Resume and its essentials

Unit 3: Presenting Information/Data

Topics:

Presenting information/data using graphics like tables, pie charts, tree diagrams, bar diagrams, graphs, flow charts

Unit 4: Interview Technique

Topics:

Dos and don'ts of an interview

Preparing for an interview

Presenting documents

Language used in an interview

Practical: Based on the theory units

10 Marks.

Reference Books:

- Sethi, Anjane & Bhavana Adhikari. *Business Communication*. New Delhi: Tata McGraw Hill
- Tickoo, Champa & Jaya Sasikumar. *Writing with a Purpose*. New York: OUP, 1979.
- Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication, 2008.
- Herekar, Praksh. *Business Communication*. Pune: Mehta Publications, 2007.
- Herekar, Praksh. *Principals of Business Communication*. Pune: Mehta Publications, 2003.
- Rai, Urmila & S. M. Rai. *Business Communication*. Himalaya Publishing House, 2007.
- Pradhan, N. S. *Business Communication*. Mumbai: Himalaya Publishing House, 2005.
- Pardeshi, P. C. *Managerial Communication*. Pune: Nirali Prakashan, 2008.

**Pattern of a Question Paper
Community college (Diploma)
Business Communication-I (AECC-I)**

Semester –I Paper: I

Time: 2 hours

Total Marks: 40

- | | | |
|------|--|----|
| Q. 1 | Do as directed. Question items on Unit 1 to be asked.
(10 out 12) | 10 |
| Q. 2 | Write a letter of application.
OR
Draft a CV/ Resume for a particular post. | 10 |
| Q. 3 | Present a given information or data using a table/ chart/ pie diagram, etc
(Any one diagram to be drawn.) | 10 |
| Q. 4 | Fill in the blanks in the given interview. | 10 |

Practical Evaluation:

10 Marks

Oral and Presentation based on the units prescribed.

SKILL BASED PAPERS:

CC-I: ENGINEERING GRAPHICS-I

1. 0. Drawing office practice.

10Hrs.

- 1.1. Importance of engineering drawing - drawing instruments: drawing board, mini drafter, compass, divider, protractor, drawing sheets etc., - layout of drawing sheets.
- 1.2. Importance of legible lettering and numbering - single stroke letters - upper case and lower case letters- general procedures for lettering and numbering - height of letters - guidelines.
- 1.3. Dimensioning - Need for dimensioning - terms and notations as per BIS - Dimension line, Extension line and Leader line - Methods of dimensioning – Importance of dimensioning rules - Exercises.
- 1.4. Scales - Study of scales - full size scale, reduced scale and enlarged scale.

2.0. Constructions of conics.

15Hrs.

- 2.1. Conics: Different types – Definition of locus, focus and directrix - Applications of ellipse, parabola and hyperbola.
- 2.2. Ellipse: Construction of ellipse by concentric circle method, rectangular method and Eccentricity method when focus and directrix are given – Practical applications.
- 2.3. Parabola: Construction of parabola by rectangular method, parallelogram method and eccentricity method when focus and directrix are given– Practical applications.
- 2.4. Hyperbola: Construction of hyperbola by rectangular method and eccentricity method when focus and directrix are given– Practical applications.
- 2.5. Scales: Construction of Diagonal and Vernier scales.

2.6. Visualization concepts and Free Hand sketching: Visualization principles – Representation of Three Dimensional objects – Layout of views- Free hand sketching of multiple views from pictorial views of objects.

3.0. Constructions of special curves. 10Hrs.

3.1. Geometric curves: Definition, application and construction of cycloid - epicycloid – hypocycloid – exercises.

3.2. Involute of a circle - Archimedean spiral – helix – exercises.

4.0. Projection of points. 5Hrs.

4.1. Projection of points – points in different quadrants.

5.0. Projection of straight lines. 10Hrs.

5.1. Projection of straight lines – parallel to one plane and perpendicular to other plane – inclined to one plane and parallel to the other plane – parallel to both the planes – inclined to both the planes (simple problems only).

Text Books

1. Gill P.S., “Engineering drawing”, S.K.Kataria & Sons.
2. Bhatt N.D. and Panchal V.M., “Engineering Drawing”, Charotar Publishing House, 50th Edition, 2010.

Reference Books

1. Gopalakrishna K.R., “Engineering Drawing” (Vol. I&II combined), Subhas Stores, Bangalore, 2007.
2. Venugopal K. and Prabhu Raja V., “Engineering Graphics”, New Age International (P) Limited, 2008.
3. Natrajan K.V., “A text book of Engineering Graphics”, Dhanalakshmi Publishers, Chennai.
4. Thomas E. French, Charles J. Vierck, Robert J. Foster, “Engineering drawing and graphic technology”, McGraw Hill International Editions.
5. Barkinson & Sinha, "First Year Engineering Drawing", Pitman Publishers.
6. Shah M.B., and Rana B.C., “Engineering Drawing”, Pearson, 2nd Edition, 2009.
7. Basant Agarwal and Agarwal C.M., “Engineering Drawing”, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.

Publication of Bureau of Indian Standards:

1. IS 10711 – 2001: Technical products Documentation – Size and lay out of drawingsheets.
2. IS 9609 (Parts 0 & 1) – 2001: Technical products Documentation – Lettering.
3. IS 10714 (Part 20) – 2001 & SP 46 – 2003: Lines for technical drawings.
4. IS 11669 – 1986 & SP 46 – 2003: Dimensioning of Technical Drawings.
5. IS 15021 (Parts 1 to 4) – 2001: Technical drawings – Projection Methods.

CC-II: ENGINEERING MATERIALS

1.0. Ferrous metals: 10Hrs.

Physical and mechanical properties viz. strength, elasticity, ductility, toughness, malleability, brittleness, hardness, stiffness, fatigue, Classification of iron and steel; pig iron, cast iron, wrought iron, steel, alloy steel, stainless steel and carbon steels.

2.0. Non- ferrous metals: 8Hrs.

Non- ferrous metals, Introduction to metals aluminium, copper, zinc, lead, tin, nickel and magnesium and their alloys; physical and mechanical properties of all the above alloys.

3.0. Engineering plastics and fiber: 10Hrs.

Important sources of plastics, Classification – thermoplastic and thermosetting, Various trade names of engineering plastics, Fiber and their classification: Inorganic and organic fibers, Usage of fiber. Plastics; Introduction, types of plastics, properties, composition and their applications.

4.0. Insulating material 8Hrs.

Various heat insulating material and their usage like asbestos, glass wool, cork, puf, china clay, thermocole, various electrical insulating material and their use like china clay, leather, bakelite, ebonite, glass wool, rubber felt. Composite materials: Introduction, properties and application.

5.0. Fuels: 4Hrs.

Coal, coke, liquid fuel, light diesel Oil (LDO), HSD, LPG, Natural gas, Principles of efficient combustion , liquid and gas fuel burners.

6.0. Refractories: 10Hrs.

6.1. Definition, classification and properties of refractories.

6.2. Manufacture of Refractories.

6.3. Testing of refractories

- Specific gravity
- Bulk density
- Porosity
- Refractoriness
- Slag attack
- Cold crushing strength

6.4. Refractory failures due to slagging, abrasion, fusion, spalling.

Recommended Books:**Text**

1. Material science RK Rajput, SK Kataria and sons, Ludhiana

Reference

- | | | |
|--|----------------|--------------------------------|
| 1. Material science and engineering | Raghavan | Prentice Hall of India, Delhi |
| 2. Material science and engineering | Srivastava | New age international (P) Ltd. |
| 3. Materials and metallurgy | OP Khanna | Dhanpatrai |
| 4. Manufacturing processes | V. Raghvan | Prentice Hall |
| 5. Introduction to physical metallurgy | Sidney H Avner | Tata McGraw-Hill |

CC-III: PATTERN & MOULDING TECHNOLOGY:**1.1 Introduction to Pattern making- 15Hrs.**

Pattern materials. Pattern making tools, different pattern materials their merits and Demerits. Different types of patterns such as single piece, Cope and Drag, Followboard, Match plate pattern etc.

1.2 Pattern Construction- Tools for making Wood patterns and Metal patterns. Principles of pattern construction and layout. Machines for making wooden pattern and machine patterns. Finishing of patterns, colour codes for pattern and importance. Pattern allowances.

1.3 Conventional Sand moulding & Molding Machines: 13Hrs.

Hand moulding with green sand using natural binders like clay, use of mechanical ramming aids & mould manipulation dry sand process, loam sand moulding, use of cow dung, Bentonites dextrin core oils & molasses as binder, mould washers Skin drying of moulds. Use of moulding machines, jolt squeeze, jolt squeeze & slinger, insertion of cores, power computation, type of flask equipment, preparation of sand cycle, mulling of the sand, flow charting special moulding/core making process,

1.4 Mould Quality & Functions & design of mould: 12Hrs.

Role of quality & packaging of sand. Mould hardness variation, Strength of mould & core enforcement, core floatation, use of chaplets for supporting cores, use of chills, mass hardness & hard spots. Defects like scabs & rat tails, storage of mould & moisture pick up. Function of cavity, components of mould, gating system & risers, Directional solidification of metals, streamlined pouring of mould, maintenance of metal purity, Rigging and shake out, recycling of sand, reclamation of sand.

1.5. Core Making: 10Hrs.

- 2.1 Importance and requirement of cores, Core making materials.
- 2.2 Core sand, its ingredients and properties.
- 2.3 Binders & machines used in core making.
- 2.4 Types of Cores, Core making processes.
- 2.5 Core venting, Core baking by different methods.
- 2.6 Finishing of Cores. Core setting chaplets.

Reference Books:

1. Principles of Metal casting - R. Heine & Rosenthal, TMH
2. Foundry Engineering - Howard F. Taylor, Wiley Eastern Ltd.
3. Test book of foundry technology - M.Lal & O.P. Khanna, Dhanpat Rai & Sons.
4. Foundry Engineering - T.R. Banga, R.L. Agrawal & T. Manghnani
5. Foundry technology - K.P. Sinha & D.B. Goel, Standard Publishers & Distributors.
6. Foundry Engineering - P.L. Jain. TMH.
7. Applied metallurgy - S. Burton.
8. Metal Casting Technology - P.C. Mukherjee, Oxford & IBH
9. Principal of foundry technology by P. L. Jain
10. Fundamental of metal casting by P.C. Mukherji
11. Introduction to foundry technology by Ekay Winter
12. Foundry technology - O.P. Khanna S. Chand & Co
13. Manufacturing Processes – Ghosh & Malik Pitman Publishers
14. Workshop Practice II – Hazra Chaudhary Khanna Publisher.

B) Practical

A. Basic Sand Testing 50 Hrs.

1. Introduction to Sand Testing Equipments
2. Sand Sample Preparation
3. Moisture Content Test
4. Compactability Test
5. Permeability Test

B. Physical Properties of Molding Sand 50 Hrs.

1. Universal Strength Test of molding sand
2. Mold Hardness test of sand
3. Core Hardness Test

B. Pattern Making Processes 50 Hrs.

1. Wooden pattern manufacturing
2. Metal Pattern Manufacturing

A) Project Work 50 Hrs.

- 1) Collecting References
- 2) Collecting Molding sand samples from foundries
- 3) Analysis of Molding sand properties and reporting

SEMESTER II

A. Nature of Examination:

For second semester there will be five theory papers. Practical Examination will be conducted at the end of the semester.

Paper Number	Title of Paper (For Semester I)	Internal Marks	Theory Exam Marks	Total Marks
AECC-II	Business Communication-II	10	40	50
CC-V	Engineering Graphics-II.	10	40	50
CC-VI	Melting Technology	10	40	50
CC-VII	Gating System and Riser	10	40	50
CC-VIII	Casting Processes	10	40	50
TOTAL		50	200	250

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	120	Projects/ Industry Training.	50
2	Journal	15		
3	Oral	15		
Total		150		50

The total weightage of first term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 40 X 5	200
2	Practical Examination.	200
3	Internal Assessment	50
TOTAL		450

B. Nature of question paper:

For each paper there will be **THREE** compulsory questions.

General nature of the question paper will be:

Question Number	Type		Marks
Q.1	Multiple choice question	No internal options.	8
Q.2	Short answer	Any four out of six	16
Q.3	Long answer	Any two out of three	16

SYLLABUS

N. B.

- (i) Figures shown in bracket indicate the total lectures required for the respective units.
- (ii) The question paper should cover the entire syllabus. Marks allotted to questions should be in proportion to the lectures allotted to respective to units.
- (iii) All units should be dealt with S.I. units.
- (iv) Project/ Industrial visit per semester is compulsory.
- (v) Use of recent editions of reference books is essential.
- (vi) Use of Output Devise allowed.

SEMESTER II

GENERAL EDUCATION PAPER:

**Community college (Diploma)
AECC-II Business Communication-II**

Semester –II

Paper: VI

Total Workload: 06 lectures per week of 60 mins.

Distribution of Workload:

Theory: 04 lectures per week

Practical: 02 lectures per week per batch of 20 students

Units Prescribed for Theory:

Unit 5: Group Discussion

Topics:

Preparing for a Group Discussion

Initiating a Discussion

Eliciting Opinions, Views, etc.

Expressing Agreement/ Disagreement

Making Suggestions; Accepting and Declining Suggestions

Summing up.

Unit 6: Business Correspondence

Topics:

Writing Memos, e-mails, complaints, inquiries, etc.

Inviting Quotations

Placing Orders, Tenders, etc.

Unit 7:English for Negotiation

Topics:

Business Negotiations
Agenda for Negotiation
Stages of Negotiation

Unit 8:English for Marketing

Topics:

Describing/ Explaining a Product/ Service
Promotion of a Product
Dealing/ bargaining with Customers
Marketing a Product/ Service: Using Pamphlets, Hoardings, Advertisement,
Public Function/ Festival

Practical: Based on the theory units

Reference Books:

- Herekar, Praksh. *Business Communication*. Pune: Mehta Publications, 2007.
- Herekar, Praksh. *Principals of Business Communication*. Pune: Mehta Publications, 2003.
- John, David. *Group Discussions*.New Delhi: Arihant Publications.
- Kumar, Varinder. *Business Communication*. New Delhi: Kalyani Publishers, 2000.
- Pardeshi, P. C. *Managerial Communication*. Pune: NiraliPrakashan, 2008.
- Pradhan, N. S. *Business Communication*. Mumbai: Himalaya Publishing House, 2005
- Rai, Urmila& S. M. Rai.*Business Communication*. Mumbai: Himalaya Publishing House, 2007.
- Sethi, Anjanee&BhavanaAdhikari.*Business Communication*. New Delhi: Tata McGraw Hill.
- Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication, 2008.
- Tickoo, Champa& Jaya Sasikumar.*Writing with a Purpose*. New York: OUP, 1979.
- Whitehead, Jeoffrey& David H. Whitehead.*Business Correspondence*. Allahabad: Wheeler Publishing, 1996.

Pattern of a Question Paper
Community college (Diploma)
AECC-II Business Communication-II

Semester –II

Paper: VI

Time: 2 hours

Total Marks: 40

- | | | |
|------|--|----|
| Q. 1 | Fill in the blanks in the following Group Discussion.
(On Unit 5) (10 out 12) | 10 |
| Q. 2 | Attempt ANY ONE of the following (A or B): | 10 |

- (On **Unit 6**)
- Q. 3 Fill in the blanks with appropriate responses: 10
(On **Unit 7**)
- Q. 4 Attempt **ANY ONE** of the following (**A** or **B**): 10
(On **Unit 8**) (10 out 12)

Practical Evaluation: 10 Marks

Oral and Presentation based on the units prescribed.

**Pattern of a Question Paper
Community college (Diploma)
Business Communication-II**

Semester –II

Paper: VI

Time: 2 hours

Total Marks: 40

- Q. 1 Fill in the blanks in the following Group Discussion. 10
(On **Unit 5**) (10 out 12)
- Q. 2 Attempt **ANY ONE** of the following (**A** or **B**): 10
(On **Unit 6**)
- Q. 3 Fill in the blanks with appropriate responses: 10
(On **Unit 7**)
- Q. 4 Attempt **ANY ONE** of the following (**A** or **B**): 10
(On **Unit 8**) (10 out 12)

Practical Evaluation:

10 Marks

Oral and Presentation based on the units prescribed.

SKILL BASED PAPERS:

CC –V: ENGINEERING GRAPHICS-II

1.0. Projection of Points, Lines and Plane Surfaces. 10Hrs.

- 1.1. Orthographic projection- principles-Principal planes-First angle projection-projection of points.
- 1.2. Projection of straight lines (only First angle projections) inclined to both the principal planes
- 1.3. Determination of true lengths and true inclinations by rotating line method and traces
- 1.4. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

2.0. Projection of Solids. 10Hrs.

- 2.1. Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method and auxiliary plane method.

3.3. Projection of Sectioned Solids and Development of Surfaces. 10Hrs.

- 3.1. Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section.
- 3.2. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones.
- 3.3. Development of lateral surfaces of solids with cut-outs and holes

4.0. Isometric and Perspective Projections. 10Hrs.

- 4.1. Principles of isometric projection – isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions and miscellaneous problems.
- 4.2. Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method

5.0. Computer Aided Drafting (Demonstration Only). 10Hrs.

- 5.1. Introduction to drafting packages (AUTOCAD) and demonstration of their use.

Text Books

1. Gill P.S., “Engineering drawing”, S.K.Kataria& Sons.
2. Bhatt N.D. and Panchal V.M., “Engineering Drawing”, Charotar Publishing House, 50th Edition, 2010.

Reference Books

1. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Stores, Bangalore, 2007.
2. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.
3. Natrajan K.V., "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai.
4. Thomas E. French, Charles J. Vierck, Robert J. Foster, "Engineering drawing and graphic technology", McGraw Hill International Editions.
5. Barkinson & Sinha, "First Year Engineering Drawing", Pitman Publishers.
6. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson, 2nd Edition, 2009.
7. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.

Publication of Bureau of Indian Standards:

1. IS 10711 – 2001: Technical products Documentation – Size and lay out of drawingsheets.
2. IS 9609 (Parts 0 & 1) – 2001: Technical products Documentation – Lettering.
3. IS 10714 (Part 20) – 2001 & SP 46 – 2003: Lines for technical drawings.
4. IS 11669 – 1986 & SP 46 – 2003: Dimensioning of Technical Drawings.
5. IS 15021 (Parts 1 to 4) – 2001: Technical drawings – Projection Methods.

CC –VI MELTING TECHNOLOGY

1.1 Melting of primary and secondary metals:

10Hrs.

Basics of melting scrap and smelting, handling and characterization of scrap, cleaning and bailing charge preparation control and charge balance, general methods of charging in furnaces, changes for SG cast iron.

1.2 Melting technology:

10Hrs.

Role of flux; Reducing agents; Air reductants and chemical additives, in the furnaces; types and selection of furnaces suitable for specific metals; cupola, induction, rotary, pit furnaces their operation and nature\characteristics of product there from; role of temperature and superheat; acid, basic and neutral operations; post melting treatment and air furnaces; melting of various types of cast iron, steel, aluminum, brass, SG cast iron.

1.3 Composition control and melt quality:

10Hrs.

Importance of metal cleanliness; endogenous and exogenous inclusions; need of formation of right quality and nature of slag; oxygen, chlorine or argon blowing to improve melt quality; role of temperature and super heat.

1.4 Efficient Operation: 10Hrs.

Control of fuel consumption, quality of fuel coke in context to sulphur and ash, use of hot blast cupola; method of producing hot blast. Use of recuperators and regenerators, regulation control of power input into the furnaces, comparison of power input into different furnaces.

1.5 Handling of liquid metal:**10Hrs.**

Different methods to consume liquid metal, ingot, pigging, power production, casting etc. economical output, management of liquid metal; handing devices, preheating of ladles; use of vacuum assisted equipment for degasification, killing and rimming of steels, inoculation in SG cast iron and its control.

CC-VII GATING SYSTEM AND RISERING**1.0 GATING SYSTEM:****25Hrs.**

- 1.1: Components of gating system- Pouring basin, down sprue, sprue well, runner bar, skimbob and ingates : Significance and function.
- 1.2: Types of gating: Top gate, bottom gate and parting gates.
- 1.3: Steps in design of gating area, calculations of pouring time, Runners and ingates for ferrous and non-ferrous alloys.
- 1.4: Importance and determination of dimensions of passages i.e gating ratio.

2.0 RISERING SYSTEM:**25Hrs.**

- 2.1 Function of risers/ feeders in compensating shrinkage in metals and alloys during solidification.
- 2.2 Riser types, shapes, sizes and locations.
- 2.3 Designing of risers using Cain's method, modulus method, Inscribed circle method.
- 2.4 Directional solidification: Use of padding, exothermic material, use of chills. Riser neck.

CC-VII CASTING PROCESSES:**1.0 CASTING****35Hrs.**

- 1.1 Sand Casting,
- 1.2 Advantages of special casting techniques over sand casting method.
- 1.3 Plaster mold casting,
- 1.4 Permanent mold casting,
- 1.5 Die casting - Gravity and pressure die casting, Hot chamber and cold chamber.
- 1.6 Centrifugal casting,
- 1.7 Shell mold casting,
- 1.8 Investment casting,
- 1.9 CO₂ process of casting,
- 1.10 Continuous process.

2.0 CASTINGS DEFECTS:**15Hrs.**

Causes and remedies of following defects

- 2.1 Blow holes, Gas holes, Pin holes,
- 2.2 Scabs, Hot tears, Cold cracks, Shrinkage cavity.

Reference Books:

1. Principles of Metal casting - R. Heine & Rosenthal, TMH
2. Foundry Engineering - Howard F. Taylor, Wiley Eastern Ltd.
3. Test book of foundry technology - M.Lal & O.P. Khanna, Dhanpat Rai & Sons.
4. Foundry Engineering - T.R. Banga, R.L. Agrawal & T. Manghnani
5. Foundry technology - K.P. Sinha & D.B. Goel, Standard Publishers & Distributors.
6. Foundry Engineering - P.L. Jain. TMH.
7. Applied metallurgy - S. Burton.
8. Metal Casting Technology - P.C. Mukherjee, Oxford & IBH
9. Principal of foundry technology by P. L. Jain
10. Fundamental of metal casting by P.C. Mukherji.

B) Practical

A. Advanced Sand Testing 50 Hrs.

1. Active Clay Percentage Test
2. Dead Clay Percentage Test
3. Rapid Drier Test
4. Sand Siever Test
5. Liquid Limit Test
6. Shatter Index Test
7. Moldability Test

B. Advanced Casting Techniques 50 Hrs.

1. Shell molding process
2. Gravity Die Casting
3. Centrifugal Casting
4. Pressure Die Casting
5. Lost Foam Casting
6. No bake process

B. Study of Furnaces 50 Hrs.

1. Cupola Furnace
2. Induction Furnace
3. Oil/Gas fired furnace
4. Pit type furnace

B) Project Work 50 Hrs.

- 3) Collecting References
- 4) Collecting Core sand samples from foundries
- 3) Analysis of Core sand properties and reporting

INDUSTRIAL TRAINING:

The purpose of industrial training is to offer wide range of practical exposures to latest practices, equipment and techniques used in the field. This training programme will help the

student in acquiring hands on experiences of various practices and events required to perform in different job situations. Through the industrial training the students are given an opportunity to develop psychomotor skills and problem solving ability.

The industrial Training has basically the following three components:

1. Orientation Programme
2. Industrial Training in the Industry
3. Report Writing and Evaluation

General Objectives: The student will be able to,

- Read and Interpret Drawing
- Observe different types of processes in ferrous / non-ferrous foundry.
- Study and develop methoding of casting.
- Identify casting defects and provides remedies.
- Study the available manuals.
- Develop history sheet for various processes/product.

Activities to be carried out during training:

1. Student should visit each section of the foundry/foundry department
2. Observe the processes, tools, machinery and equipment used
3. Observe testing of castings at each stage
4. Study drawings and interpret the drawings
5. Study the organisational structure of the company
6. Study the product development from raw material to finished goods
7. Observe safety norms adopted
8. Prepare a report on a case study which includes all the components referred above.

Training Report:

The students will have to go for industrial training in all the sections of foundry. After training the student is required to prepare a report on the following points:

- Details of the industry
- Layout of the foundry- different sections
- List of equipments in each section
- Organizational structure of the industry
- Description of major processes
- Quality measures adopted in the industry
- Safety norms and there implementation.

SYLLABUS

DIPLOMA IN PHOTOGRAPHY

SEMESTER – I

GENERAL EDUCATION:

Paper – I: English for Business Communication:

Total Workload: 06 lectures per week of 60 mins.

Distribution of Workload:

Theory: 04 lectures per week

Practical: 02 lectures per week per batch of 20 students

Units Prescribed for Theory:

40 Marks.

Unit 1: Use of English in Business Environment

Topics:

Business Vocabulary: Vocabulary for banking, marketing and for maintaining public relations

What is a sentence?

Elements of a sentence

Types of sentence: Simple, compound, complex

Unit 2: Writing a Letter of Application and CV/ Resume

Topics:

Structure of a letter of application for various posts

CV/ Resume and its essentials

Unit 3: Presenting Information/Data

Topics:

Presenting information/data using graphics like tables, pie charts, tree diagrams, bar diagrams, graphs, flow charts

Unit 4: Interview Technique

Topics:

Dos and don'ts of an interview

Preparing for an interview

Presenting documents

Language used in an interview

Practical: Based on the theory units

10 Marks.

Reference Books:

Sethi, Anjane & Bhavana Adhikari. *Business Communication*. New Delhi: Tata McGraw Hill

Tickoo, Champa & Jaya Sasikumar. *Writing with a Purpose*. New York: OUP, 1979.

Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi:

Student Aid Publication, 2008.

Herekar, Praksh. *Business Communication*. Pune: Mehta Publications, 2007.

Herekar, Praksh. *Principals of Business Communication*. Pune: Mehta Publications, 2003.
 Rai, Urmila & S. M. Rai. *Business Communication*. Himalaya Publishing House, 2007.
 Pradhan, N. S. *Business Communication*. Mumbai: Himalaya Publishing House, 2005.
 Pardeshi, P. C. *Managerial Communication*. Pune: NiraliPrakashan, 2008.

SKILL BASED PAPERS:

Paper –II: Foundation Photography

Name of Course Teacher:	Mr. Raviraj Shamrao Sutar
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge meaning and proper use of camera
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand the basic techniques of using professional cameras	1
CF107.2	Understand the basic lights arrangements for indoor and outdoor photography. Illustrate understanding of colour variations Develop and demonstrate ability to recognize ambient light	2
CF107.3	Developing the sense to Understand reflected light , Colour of light and creating proper Image	2
CF107.4	To develop the basic knowledge of composition for photography.	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
 1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-	-
CF107.4	-	-	2	-	-	-	-	-	-	-	-

Course Content :

1. Basics types of Optics using in lances
2. Science behind image formation.
3. Introduction to western philosophy
4. Arrangement of framing styles
5. Finding Story
6. Creating Story
7. Position of camera and oprater
8. Composition of photography
9. Understanding ambiance light and reflection
10. Understanding Creative light and direction
11. Developing Eye.
12. Creating social awareness.
13. Types photography

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Photography	Dr. Jitendra Kater	Generic-2011	-	2015
2	Digital Photography-Camera & Photography	Dr. Jitendra Kater	Generic-2011	-	2015
3	Western Maharashtra	Raman Kulkarni	Maharashtra Ecotourism Development Board, Nagpur		2018
4	The Beginner Photography Guide	D.K.	Dorling Kindersley ltd.	-	2016

Paper –III : Photography Technique part I

Name of Course Teacher:	Mr. Mangesh Vilasrao Khole
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of Studio and ambiance light for photography.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO 1	Discover the basic principles of Light reflection and their intensity .	1
CO 2	Encourage to adopt a creative approach to problem solving and to become self-critical in the Lighting of the work.	2
CO 3	Develop the various methods of creating light for photography	2
CO 4	Understand the use of accessories for using indoor & outdoor photography	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107. 1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	2	-	-	-	-	-	-	-	-	-
CF107.4	-	-	1	-	-	-	-	-	-	-	-

Course Content :

1. Lighting Basics
2. Nature of Light
3. Different properties of light- direction, intensity, color
4. Different lighting instruments
5. Different lighting accessories
6. Portrait Lighting Patterns- Split lighting, loop lighting, Rembrandt lighting, butterfly lighting.
7. lighting.
8. Creative Lighting Introduction
9. Lenses – types, properties, aberrations.
10. Photographic Optics – camera lenses – technical development
11. Image sensors- different types working
12. Science behind image formation in human camera

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	On Photography	Susan Sontag	Farrar, Straus and Giroux	-	1977
2	Handbook of Photography	Cengage Learning	Thompson Delmar Learning		2006
3	Painting With Light	John Alton	Pearson Education	-	2008
4	"Principles of Compiler Design"	Alfred V Aho	Narosa Publishing House	-	2002

Paper IV: Basic Photoshop

Name of Course Teacher:	Mr. Akshaykumar Satappa Khot
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge of Handling software
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Provide exposure to images and information to inspire great work, further study, and exploration. Organize information for better communication.	1
CF107.2	Understand the basic editing tools and there use for editing	1
CF107.3	Understand the techniques of image editing for printing	1
CF107.4	Understand unification/separation of design and society. Unification/separation of design and technology.	2

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	2	-	-	-	-	-	-	-	-	-	-
CF107.3	2	-	-	-	-	-	-	-	-	-	-
CF107.4	-	1	-	-	-	-	-	-	-	-	-

Course Content :

1. History of Photoshop
2. Need of editing
3. Work with the Start workspace : A first look at the Photoshop working area A:
Tools panel | B: History panel | C: Color panel | D: Creative Cloud Libraries panel | E: Layers panel
4. Different brightness levels: Choose Edit > Preference (Windows) or Photoshop > Preferences (Mac OS) and select a Color Theme swatch in the Interface section.

5. Maximized screen space: Click the button at the bottom of the toolbar to switch between Standard and Fullscreen display modes.
6. Creating Documents
7. Use Tools
8. Default key board shortcuts
9. Menu bar
10. Filters
11. Plug-in & Presets
12. Define Brush
13. Sizing of Image
14. Colors of pixel
15. Grounds

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Sampurn Photoshop	Sou Sujata Athavale, Narendra Athavale	-	-	2016
2	Photoshop for Lightroom User	Scott Kelvy	-	-	2013
3	Master In Photoshop	Solition web tech. Inc.	Khanna Publisher	-	-

B) Practical

A) Software Skill Development

1) Photoshop – Basic **50 Hrs.**

B) Designing Skill Development 100 Hrs.

- 1) Use of Tools
- 2) Colour Scheme Implementation
- 3) Basic Layout
- 4) Designing and Effects

C) Project Work 50 Hrs.

- 1) Background Changing
- 2) Object replacement
- 3) Size and Layout

SEMESTER II

A. Nature of Examination:

For second semester there will be four theory papers. Practical Examination will be conducted at the end of the semester.

Paper Number	Title of Paper (For Semester II)	Internal Marks	Theory Exam Marks	Total Marks
V	Business Communication II	10	40	50
VI	Applied Physic & Photography	10	40	50
VII	Photography Technique II	10	40	50
VIII	Photo Editing	10	40	50
TOTAL		40	160	200

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	180	Projects/ Industry Visit	50
2	Portfolio	20		
	Total	200		50

The total weightage of second term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 50 X 4	200
2	Practical Examination.	200
3	Internal Assessment	50
	TOTAL	450

B. Nature of question paper:

For the **papers VI to VIII** there will be in all **SEVEN** questions in each paper of which any **FIVE** should be solved. All questions will carry equal marks i.e. each question will be of 10 marks.

General nature of the question paper will be:

Question Number	Type		Marks
Q.1	MCQ	No internal options	8
Q.2	Long answer	Any two out of three	16
Q.3	Short notes	Any four out of six	16

SYLLABUS:

SEMESTER II

GENERAL EDUCATION PAPER:

**CC part-I (Diploma)
English for Business Communication-II**

Semester –II

Paper: V

Total Workload: 06 lectures per week of 60 mins.

Distribution of Workload:

Theory: 04 lectures per week

Practical: 02 lectures per week per batch of 20 students

Units Prescribed for Theory:

Unit 5: Group Discussion

Topics:

Preparing for a Group Discussion

Initiating a Discussion

Eliciting Opinions, Views, etc.

Expressing Agreement/ Disagreement

Making Suggestions; Accepting and Declining Suggestions

Summing up.

Unit 6: Business Correspondence

Topics:

Writing Memos, e-mails, complaints, inquiries, etc.

Inviting Quotations

Placing Orders, Tenders, etc.

Unit 7: English for Negotiation

Topics:

Business Negotiations

Agenda for Negotiation

Stages of Negotiation

Unit 8: English for Marketing

Topics:

Describing/ Explaining a Product/ Service

Promotion of a Product

Dealing/ bargaining with Customers

Marketing a Product/ Service: Using Pamphlets, Hoardings, Advertisement,

Public Function/ Festival

Practical: Based on the theory units

Reference Books:

- Herekar, Praksh. *Business Communication*. Pune: Mehta Publications, 2007.
 Herekar, Praksh. *Principals of Business Communication*. Pune: Mehta Publications, 2003.
 John, David. *Group Discussions*. New Delhi: Arihant Publications.
 Kumar, Varinder. *Business Communication*. New Delhi: Kalyani Publishers, 2000.
 Pardeshi, P. C. *Managerial Communication*. Pune: NiraliPrakashan, 2008.
 Pradhan, N. S. *Business Communication*. Mumbai: Himalaya Publishing House, 2005
 Rai, Urmila& S. M. Rai. *Business Communication*. Mumbai: Himalaya Publishing House, 2007.
 Sethi, Anjanee&BhavanaAdhikari. *Business Communication*. New Delhi: Tata McGraw Hill.
 Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication, 2008.

SKILL BASED PAPERS :**Paper –VI: Applied Physic & Photography**

Name of Course Teacher:	Mr. Raviraj Shamrao Sutar
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of object motion , light traveling and reflection of light
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand proper use for photography of ambience light	1
CF107.2	Understand to creating light for self creativity of their work	2
CF107.3	Develop the motion sense and create proper exposure	2
CF107.4	Understand Light Physics for creativity	4

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PasdfhO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	2	-	-	-	-	-	-	-	-	-
CF107.3	-	1	-	-	-	-	-	-	-	-	-
CF107.4	-	-	1	-	-	-	-	-	-	-	-

Course Contents :

1. Highlight & Shadow
2. Motion Blur Picture
3. Reflection
4. ND Filter (Natural Density)
5. Ambiance Direction & reflection
6. Light Sensitivity
7. Indoor Light Direction & reflection
8. High speed synchronization

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Photography	Dr. Jitendra Kater	Generic-2011	-	2015
2	Digital Photography-Camera & Photography	Dr. Jitendra Kater	Generic-2011	-	2015
3	Western Maharashtra	Raman Kulkarni	Maharashtra Ecotourism Development Board, Nagpur		2018
4	The Beginner Photography Guide	D.K.	Dorling Kindersley ltd.	-	2016

Paper –VII: PHOTOGRAPHY TECHNIQUE (Part 2)

Name of Course Teacher:	Mr. Mangesh Khole
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge of basic techniques of arrangements of light and there reflections
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand creating glamour, split, butterfly light, rembrandt light, Rim light, High Key & Low Key .	1
CF107.2	Understand the colors of light and creating innovative image frame.	1
CF107.3	Study the flexible setting of various cameras for photography .	2
CF107.4	Use techniques for solving problem during photography.	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	3	-	-	-	-	-	-	-	-	-	-
CF107.3	-	1	-	-	-	-	-	-	-	-	-
CF107.4	-	-	2	-	-	-	-	-	-	-	-

Course Contains :

1. Flat Light
2. Split Light
3. Rim Light
4. Rembrandt Light
5. Butterfly Light
6. Key Light
7. Fill Light
8. High Key
9. Low Key
10. 8 by 8 Formula
11. 16 by 16 formula
12. Outdoor Motion picture

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Digital Photography	Dr. Jitendra Kater	Generic-2011	-	2015
2	Digital Photography-Camera & Photography	Dr. Jitendra Kater	Generic-2011	-	2015
3	Western Maharashtra	Raman Kulkarni	Maharashtra Ecotourism Development Board, Nagpur		2018
4	The Beginner Photography Guide	D.K.	Dorling Kindersley ltd.	-	2016

Paper –VIII: Photo Editing

Name of Course Teacher:	Mr. Akshaykumar Satappa Khot
Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge of elements and principles in Photography editing
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CF107.1	Understand the art Photography and using as per necessary filters.	1
CF107.2	Know all details in light and shadows and manage proper combination of light.	2
CF107.3	Understand types of perspective of object. and making proper lens correction	2
CF107.4	Use perspective in various designs, action, created by using Photoshop Software	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	1	-	-	-	-	-	-	-	-	-
CF107.3	-	1	-	-	-	-	-	-	-	-	-
CF107.4	-	-	2	-	-	-	-	-	-	-	-

Course Content :

1. ID packaging
2. Sizing
3. Color Correction
4. Level Control
5. Action
6. Plug-in
7. Filter
8. Pallets
9. Masking

"Dissemination of Education for Knowledge, Science and Culture"
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF HISTORY

M.A. Part - I
Semester-I & II


SYLLABUS

Under Choice Based Credit System

To be implemented from

Academic Year 2022-23




HEAD
DEPARTMENT OF HISTORY
VIVEKANAND COLLEGE KOLHAPUR
(AUTONOMOUS)

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

CBCS SYLLABUS FOR M.A. Part-I with effect from Sept.2022

Theory: 270 Hours/ Lectures Per Semester

Total Credits: 72

Sr. no	Paper Title	Subject Code	Core Course / optional	Credits
SEMESTER- I				
1	History of Ancient India -I	CC 2700	CC	04
2	Research Methodology in History	CC 2701	CC	04
3	History of Sultanate India (1206-1526)-I	CC 2702	Opt	04
4	History of Social Reformers in India	CC 2703	Opt	04
SEMESTER- II				
1	History of Ancient India -II	CC 2706	CC	04
2	Applications of History	CC 2707	CC	04
3	History of Sultanate India (1206-1526)-II	CC 2708	Opt	04
4	History of Social Reformers in Maharashtra	CC 2709	Opt	04
SEMESTER -III				
1	History of Mughal India (1526-1707)-I	CC 2712	CC	04
2	Modern India (1757-1857)-I	CC 2713	CC	04
3	Modern India (1857-1920)-I	CC 2714	Opt	04
4	India since Independence (1947-2000)-I	CC 2715	Opt	04
SEMESTER -IV				
1	History of Mughal India (1526-1707)-II	CC 2718	CC	04
2	Modern India (1757-1857)-II	CC 2719	CC	04
3	Modern India (1857-1920)-II	CC 2720	Opt	04
4	India since Independence (1947-2000)-II	CC 2721	Opt	04

SEC: INDOLOGY, HISTORICAL TOURISM, MODI SCRIPT STUDIES**Project Dissertation + Viva= 8 Credits**

- Exam Pattern 40+10= Theory+ Internal =50 marks for each paper / semester

VIVEKANAND COLLEGE (AUTONOMOUS), KOLHAPUR

Dept. of History

(CBCS SYLLABUS FOR M.A. Part-I with effect from Sept. 2022)

M.A.-I, Sem- I + Sem- II = (4*8) = 32 Credits+ SEC 4 Credit

History of Ancient India-I

Course Outcomes: After learning this course students will be able to

CO I: Understand importance of sources for the reconstruction of ancient Indian history

CO II: Elaborate Stone Age cultures in India

CO III- Examine the archaeological developments in Indus Valley Civilization

CO IV: Acquaint with the Vedic and Post Vedic India

	Content	Teaching Hours	Credits
Module-I	Nature of Sources a. Archaeological Sources b. Literary Sources c. Foreign Traveler Accounts: Megasthenes (Indica), Fa-hiyan, Yuan-Chang d. Important Geographical Sites (practical work)	15	01
Module- II.	Prehistory a. Paleolithic Culture : Salient Features b. Mesolithic Culture : Salient Features c. Neolithic Culture: Salient Features	15	01
Module- III.	Proto-history a. Origin & First Urbanization: Town Planning b. Socio-Economic-Religious Beliefs, Seals, Trade, Scripts and Decline c. Chalcolithic Culture in Maharashtra : Jorve Culture	15	01
Module- IV.	Historic Period a. Vedic & Post Vedic Era :Society, Economy & Religious beliefs, Sabha & Samiti b. Second Urbanization : Causes c. State Formation: Janpada, Mahajanpada, Ganrajya	15	01

History of Ancient India - II

Course Outcomes: After learning this course students will be able to
CO I: Understand Jainism & Buddhism through their dictums, philosophy and contribution to Indian Society.
CO II: Reconstruct Mauryan history with the available literary and archaeological sources
CO III: Examine the rule of Satvahana dynasty.
CO IV: Evaluate the history of Gupta Dynasty.

	Content	Teaching Hours	Credits
Module-I	Pre-Mauryan Period a. Causes of Religious Transformation b. Jainism & Buddhism: Salient Features c. Contribution of Buddhism & Jainism to Indian Society	15	01
Module- II.	Mauryan Dynasty a. Alexander's Invasion & Rise of Mauryan Dynasty b. Emperor Ashoka and His Dhamma c. Society, Administration, Economy & Decline of Mauryan Empire	15	01
Module- III.	Satavahana Dynasties a. Satavahana Polity b. Economy: Trade with Rome, Silk route & Guilds c. Developments in Art, Architecture - and Literature (Gathasaptshati)	15	01
Module- IV.	Gupta Dynasty a. Polity, Beginning of Feudalism b. Economy: Urban Decay c. Debate of Golden Age: Art, Architecture, Literature, Society, Caste & Women	15	01

Essential Readings

1. N. N. Bhattacharya, *Ancient Indian Rituals and Their Social Contents*, 2nd ed., 1996.
2. Romila Thapar, *Early India : From the Origins to 1300*, 2002.
3. A. L. Basham, *The Wonder that Was India*, 1971.
4. H. C. Raychaudhuri, *Political History of Ancient India*, Rev. ed. with Commentary by B. N. Mukherjee, 1996.
5. Romila Thapar, *Asoka and Decline of Mauryas*, Oxford Publications, New Delhi, 2012
6. R. S. Sharma, *Material Culture and Social Formations in Ancient India*, 1983.
7. Y. N. Kadam, *History of Ancient India*, Phadke Publication, 2005 (Marathi)
8. Gaydhani & Raurkar, *Cultural History of Ancient India*, Continental Publication, Pune-2002(Marathi).
9. Upinder Singh, *A History of Ancient and Early Medieval India: From the stone Age to 12 century*, Pearson Publication, New Delhi, 2009
10. D. N. Jha , *Ancient India in Historical Outline*, Manohar Publishers & distributors, 2003
11. R. S. Sharma, *Indian Feudalism*, Luxmi Publication, 2008
12. Dr. S. R. Kattimani , *Prachin Bharat Ka Sankshipt Itihas*, ABS Publication, Varanasi, 2018.(Hindi)
13. D. N. Zha *Prachin Bharat Ek Aithihasik PariPreksha*

VIVEKANAND COLLEGE (AUTONOMOUS), KOLHAPUR

Dept. of History

(CBCS SYLLABUS FOR M.A. Part-I with effect from Sept. 2022)

Research Methodology in History

Sem.-I, Paper-II.

Course Outcomes-After learning this course students will be able to

CO-I- Understand meaning, nature, scope and importance of history

CO-II- Examine the sources in historical research.

CO-III: Acquaint with historical research process and methodology

CO-IV- Examine the tools in historical research.

	Content	Teaching Hours	Credits
Module-I	Nature and scope of History 1. Meaning and Definitions, Nature, Scope & Importance 2. Kinds of History 3. Auxiliary Sciences of History	15	01
Module- II.	Sources of Historical Research 1. Primary and secondary sources 2. Archaeological sources 3. Modern Sources (Survey, Interview, News Papers, Questionnaire, Radio, T.V, Internet etc.)	15	01
Module- III.	Research Methodology 1. Selection of Topic 2. Data Collection 3. Evaluation of Sources a) External Criticism b) Internal Criticism 4. Presentation	15	01
Module- IV.	Tools of Writing History 1. Notes Taking 2. Footnotes 3. Dating 4. Index 5. Bibliography	15	01

Sem.-II, Paper-VI

Applications of History

Course Outcomes-After learning this course students will be able to

CO I: Acquaint with meaning, types and features of Museums

CO II: Examine the meaning, nature and importance of Historical Tourism

CO III: Determine the types, importance and administration of forts.

CO IV: Explore the life and contribution of historians in Maharashtra

	Content	Teaching Hours	Credits
Module-I	Museums 1. Meaning, Development, Types and Features 2. Importance for the study of History 3. Process of Preservation and Conservation 4. Museums for the study a) Chh. Shivaji Maharaj Museum Mumbai b) Town Hall Museum Kolhapur	15	01
Module- II.	Historical Tourism 1. Meaning, Nature, Scope, Importance 2. Characteristics of Tourist Guide 3. Tourist Destinations a) Kolhapur- Panhala Fort b) Raigad c) Ajanta -Ellora caves	15	01
Module- III.	Forts 1. Importance of Forts 2. Types of Forts 3. Administration of Forts	15	01
Module- IV.	Historians in Maharashtra 1. V. K. Rajwade 2. G.S. Sardesai 3. Appasaheb Pawar	15	01

Research Project (Internal Assessment)

1. A Study of Action Research- Introduction, Interdisciplinary Relevance, Objectives, Scope & Importance, Hypothesis, Methodology, Chapter scheme, References
2. Preparation of Model Research Proposal

Books of Reference:

1. Carr E.H. What is History?
2. Sen S.P. Historians and Historiography in Modern India
3. Sheikh Ali B. History : Its Theory and Method
4. Chitnis K.N., Research Methodology in History.
5. Dr. B.N. Sardesai (2012), Introduction to Historiography, Phadke Publication, Kolhapur.
6. Dr. K.L. Khurana (2006), Concepts and Methods of Historiography, Lakshmi Narain Agarwal, Agra.
7. Dr. B.N. Sardesai (2005), Historiography – Concepts, Methods and Tools , Phadke Publication, Kolhapur.
8. Dr. Srinivas Satbhai (2011), Historiography, Vidya Books Publishers, Aurangabad

VIVEKANAND COLLEGE (AUTONOMOUS), KOLHAPUR

Dept. of History

(CBCS SYLLABUS FOR M.A. Part-I with effect from Sept. 2022)

HISTORY OF SULTANATE INDIA (1206 - 1550)

Course Outcomes: After studying this course students will be able to:
CO I: Understand the important sources of Sultanate Indian History.
CO II: acquaint with the early phase of Gulam Dyansty .
CO III: Elaborate historical relevance of Allaudin Khilji
CO IV: Evaluate the history of Muhammad Bin Tughlaq.

Sem. I Paper No - 3

	Content	Teaching Hours	Credits
Module-I	Sources and Historiography: a. Foreign Sources (Persian Sources) - Albaruni- <i>Tarikh Ul-Hind</i> , (Muhammad Ghazani) Minaj-Us-Siraj - <i>Tabakat E Nasiri</i> (Iltutmish) Hasan Nijami-Tajul - <i>Masir</i> (Kutubuddin Aibak) Ziyauddin Barni - <i>Tarikh E Firojshahi</i> Shams E- Siraj Afif - <i>Firojshah</i> Ibn Batuta-Kitab -Ur- <i>Rahela</i> b. Indian Sources (Vernacular Sources) c. Archaeological Sources (Epigraphic)	15	01
Module- II.	Establishment of Sultanate Rule Under Gulam Dynasty a. Qutbuddin Aibak (1206-1210) b. Iltutmish (1210-1236) c. Razia Sultana (1236-1240) Balaban (1266-1286)	15	01
Module- III.	Sultan Allaudin Khilaji (1296-1316) a. North Victory b. Southern Policy c. Market Regulations	15	01

Module- IV.	Muhammad Bin Tughlaq (1325-1351) a. Moving of Capital b. Agricultural Experiment in Doab Region c. Token Currency d. Internal Conflicts	15	01
--------------------	--	-----------	-----------

SEMESTER: II SOCIETY, ECONOMY, CULTURE

Course Outcomes: After studying this course students will be able to:
CO I: Know the other regional dynasties such as Vijayanagar Empire and Bahmani Empire
CO II: Understand the social and economic condition during sultanate
CO III: acquaint with the social and economic condition during Vijayanagar and Bahmani Empire
CO IV: Determine the progress of art, architecture and literature during sultanate period.

Paper No VII:

	Content	Teaching Hours	Credits
Module-I	Other Regional Dynasties a. Orientation with Vijaynagar Empire b. Orientation with Bahamani Empire	15	01
Module- II.	Society & Economy During Sultanate a. Social Condition b. Economic Condition c. Religious Condition	15	01
Module- III.	Society & Economy During Vijayanagar and Bahamani Empire a. Social Condition b. Economic Condition c. Religious Condition	15	01
Module- IV.	Art and Architecture during Sultanate a. Art b. Architecture c. Literature	15	01

ESSENTIAL READINGS

1. Mohammad Habib and K.A. Nizami, eds, *Comprehensive History of India*, Vol. V, The Delhi Sultanate.
2. Satish Chandra, *Medieval India I*. Peter Jackson, *The Delhi Sultanate*.
3. Catherine Asher and Cynthia Talbot, *India Before Europe*.
4. Tapan Raychaudhuri and Irfan Habib, eds, *Cambridge Economic History of India*, Vol. I.
5. K.A. Nizami, *Religion and Politics in the Thirteenth Century*.
6. W.H. McLeod, Karine Schomer, et al, Eds, *The Sants*.
7. S.A.A. Rizvi, *A History of Sufism in India*, Vol. I.
8. Mohibul Hasan, *Historians of Medieval India*.
9. Vijaya Ramaswamy, *Walking Naked: Women, Society, and Spirituality in South India*.
10. Burton Stein, *New Cambridge History of India: Vijayanagara*.
11. Pushpa Prasad, *Sanskrit Inscriptions of the Delhi Sultanate*.
12. प्रा. मदन मर्डीकर (1987), *मध्ययुगीन भारताचा इतिहास (ई.स. 1007-1707)*, विद्या बुक्स पब्लिशर्स, औरंगाबाद
13. बागळ ढवळे (1987), *मध्यकालीन भारत (ई.स. 1206-1707)*, , विद्या प्रकाशन , नागपूर

VIVEKANAND COLLEGE (AUTONOMOUS), KOLHAPUR

CBCS SYLLABUS FOR M.A. Part-I with effect from Sept. 2022

History of Social Reformers in India

Course Outcomes: After learning this course students will be able to			
CO1: Examine the Socio-Economic & Political condition of India in 19 th century			
CO2: Criticize British Rule over India through its administration, Education & Contribution of Missionaries			
CO3: Study & examine the contribution of social reformers and organizations in India			
CO4: Understand the contribution of social organizations in Maharashtra			
SEM I: Paper No: IV			
	Content	Teaching Hours	Credits
Module-I	19th Century India a. Indian social life during 19 th century b. Economic condition during 19 th century India c. Religious condition during 19 th century India	15	01
Module- II.	Nature of Early British Rule a. Provincial Administration of British b. Land Revenue System c. Education during British rule d. Contribution of missionaries	15	01
Module- III.	Social reformers and organizations a. Rajaram Mohan Roy and Bramho Samaj b. Swami Dayanand Sarasvati and Arya Samaj c. Swami Vivekanand and Ramkrishn Mission	15	01
Module- IV.	Social Organizations in Maharashtra a. Satyashodhak Samaj b. Prarthana Samaj c. Aarya Samaj	15	01

Social Reformers in Maharashtra

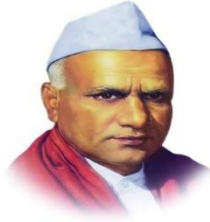
Course Outcomes: After learning this course students will be able to
CO1: Criticize the social contribution of Chh. Shahu Maharaj
CO2: Evaluate the of social contribution of Vitthal Ramji Shinde
CO3: Examine the of socio educational contribution of Dr. Babasaheb Ambedkar
CO4: Understand the life & work of Educational Reformers in Maharashtra

SEM- II Paper No: VIII

	Content	Teaching Hours	Credits
Module-I	Rajarshi Chh. Shahu Maharaj a. Birth and Early Life b. Social Work c. Educational Work d. Other Reforms	15	01
Module- II.	Vitthal Ramji Shinde a. Birth and Early Life b. Social Work c. Other Contribution	15	01
Module- III.	Dr. Babasaheb Ambedkar a. Birth and Early Life b. Social Work c. Educational Work d. Other Reforms	15	01
Module- IV.	Educational Reformers in Maharashtra a. Punjabrao Deshmukh b. Karmvir Bhaurao Patil c. Shikshanmaharshi Dr. Bapuji Salunkhe	15	01

ESSENTIAL READINGS:

- १) डॉ. एस.एस. गाठाळ (२०१०), आंबेडकरी चळवळीचा इतिहास, कैलाश पब्लिकेशन्स, प्रथमावृत्ती, औरंगाबाद.
- २) कीर धनंजय (१९५७), डॉ. बाबासाहेब आंबेडकर, पॉप्युलर प्रकाशन, द्वितीय आवृत्ती, मुंबई
- ३) डॉ. बाबासाहेब आंबेडकर गौरव ग्रंथ महाराष्ट्र राज्य साहित्य आणि संस्कृती मंडळ शासकीय मध्यवर्ती मुद्रणालय-२००६
- ४) डॉ. एस. जी. जाधव (२००५), आधुनिक महाराष्ट्राचा इतिहास (इ.स. १८१८ ते १९६०) संस्कृती पुस्
- ५) डॉ. शंकरराव कदम (२०००), महर्षी वि. रा. शिंदे, साहित्य व कार्ये, स्वरूप प्रकाशन, प्रथमावृत्ती, औरंगाबाद .
- ६) प्राचार्य आण्णासाहेब गरूड व प्राचार्य बी.बी. सावंत (१९९५), महाराष्ट्रातील समाजसुधारणेचा इतिहास (१८१८ ते १९५०),
कैलास पब्लिकेशन्स, प्रथमावृत्ती, औरंगाबाद
- ७) य. दी. फडके, (२००५), विसाव्या शतकातील महाराष्ट्र, के. सागर पब्लिकेशन्स, द्वितीय आवृत्ती, पुणे.
- ८) प्रा. व्ही. बी. पाटील (२००४), विसाव्या शतकातील महाराष्ट्रामधील समाजसुधारणेचा इतिहास, के. सागर पब्लिकेशन्स,
प्रथमावृत्ती पुणे.
- ९) डॉ. किशोरकुमार गव्हाने व डॉ. एस. पी. शिंदे (२०१४), महाराष्ट्रातील समाजसुधारणेचा इतिहास, एज्युकेशनल पब्लिशर्स अँड
डिस्ट्रिब्युटर्स, प्रथमावृत्ती, औरंगाबाद.
- १०) पांडुरंग बाळाजी कवडे (१९६८), महात्मा जोतीराव फुले यांचे चरित्र, यशवंत प्रिंटिंग प्रेस, नाशिक .
- ११) रा. ना. चव्हाण (संपादक) रमेश चव्हाण (२००५), डॉ. बाबासाहेब आंबेडकर यांचा शोध व बोध, एस. जयकुमार ऑफसेट, पूणे.
- १२) य. दि. फडके (२००६), महात्मा फुले समग्र वाङ्मय, महाराष्ट्र राज्य साहित्य आणि संस्कृती मंडळ, मुंबई .
- १३) प्रा. एन. डी. पाटील, प्रा. टी. एस. थोरात, प्रा. डॉ. विश्वनाथ पवार (२०१५), महाराष्ट्रातील समाज सुधारक, फडके प्रकाशन,
कोल्हापूर.
- १४) मो. नि. ठोके (१९८९), डॉ. बापूजी साळुंखे : शोध आणि बोध, पारख प्रकाशन, प्रथमावृत्ती, बेळगाव .
- १५) डॉ. गजानन सुर्वे (२००२), शिक्षण महर्षी डॉ. बापूजी साळुंखे व्यक्ती आणि कार्ये, द्वितीय आवृत्ती, मुरारी मुद्रणालय, कोल्हापूर.
- १६) डॉ. एस. आर. कट्टीमनी (२०१८), आधुनिक महाराष्ट्रातील समाजसुधारणा व समाज सुधारक, ए.बी.एस. पब्लिकेशन,
वाराणसी



“Education for Knowledge, Science and Culture”

-Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's



VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

M.A.I - History (2022-23)

Sem. I & Sem. II

Structure of Question Paper

Discipline Specific Course

Total Marks = 40

Time=2.00 hours

* All Questions are compulsory (Based on all Modules)

Q.1	A. Multiple Choice Questions	05 Marks
	B. Match the Pairs	05 Marks
Q.2	A. Broad Answer Question	10 Marks
	B. Broad Answer Question	10 Marks
Q.3	Short notes (Any 2)	10 Marks
	Total	40 Marks

Internal Evaluation: 10 Marks

Sr. No	Evaluation Type	Marks
1.	Home Assignment/ Book Review/ Historic Movie Summary	05
2.	UNIT TEST	05
	Total	10 Marks

"Dissemination of Education for Knowledge, Science and Culture"
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF HISTORY

**M.A. Part - II
Semester-III & IV**

SYLLABUS

Under Choice Based Credit System

To be implemented from

Academic Year 2023-24



Head

**DEPARTMENT OF HISTORY
VIVEKANAND COLLEGE
KOLHAPUR (EMPOWERED AUTONOMOUS)**

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

CBCS SYLLABUS FOR M.A. Part-II with effect from July, 2023

Theory: 270 Hours/ Lectures Per Semester

Sr. no	Paper Title	Subject Code	Core Course / Optional	Credits
SEMESTER -III				
1	History of Mughal India (1526-1707)-I	CC 2712	CC	04
2	History of Modern India (1757-1857)-I	CC 2713	CC	04
3	History of Modern India (1857-1920)-I	CC 2714	Opt	04
4	India since Independence (1947-2000)-I	CC 2715	Opt	04
5	Women in Indian History-I	CC 2715	Opt	04
SEMESTER -IV				
1	History of Mughal India (1526-1707)-II	CC 2718	CC	04
2	History of Modern India (1757-1857)-II	CC 2719	CC	04
3	History of Modern India (1857-1920)-II	CC 2720	Opt	04
4	India since Independence (1947-2000)-II	CC 2721	Opt	04
5	Women in Indian History-II	CC-2721	Opt	04
	Project Dissertation + Viva			04
	Indology+ Historical Tourism			04

- Exam Pattern 40+10= Theory+ Internal =50 marks for each paper / semester

VIVEKANAND COLLEGE (AUTONOMOUS), KOLHAPUR

Dept. of History

(CBCS SYLLABUS FOR M.A. Part-II with effect from July, 2023)

M.A.-II, Sem-I + Sem- II = (4*8) = 32 Cr + SEC 4 Cr + Project 4 Cr =40 Credits

History of Mughal India (1526-1707) -I

M.A.II- DSC-2712

Objectives of course:

The objective of this paper is to enable the student to Understand and adequate with the socio-economic condition of Mughal India with the help of available literary and archaeological sources.

Learning outcomes:

By the end of this course, it is expected that the student will be able

CO I: To understand with sources of Mughal Indian History

CO II: To discuss the Mughal Polity and administration system.

CO III: To examine rural economy & society under Mughal Era.

CO IV: To evaluate the development of trade and commerce during Mughal period.

Module No.	Name of Unit	Teaching Hours	Credits
1.	1. Sources a) Literary: Sources in Farsi , Marathi, and Sanskrit languages. b) Archaeological sources c) Foreign travellers' account: Factory Records & Fransis Bernier d) Mughal Court Writers :-Abul Fajal & Abdul Kadir Badayuni	15	1
2.	2. Mughal Polity a) Mughal Administrative system b) Mansab & Jagir c) Religious policy of Akbar & Aurangzeb	15	1
3.	3. Rural Economy & Society a) Agricultural Production, Techniques & Crop Patterns, irrigation b) Land Revenue System c) The Village community	15	1
4.	4. Trade & Commerce a) Trade routes & Internal trade, Mode of Transports b) Indian ocean trade network in 17 th century	15	1
	Total	60	4

Vivekanand College , Kolhapur (Autonomous)
History of Mughal India (1526-1707 A.D.) -II
Syllabus for M.A. II. History (Hons) w.e.f. 2023-24

M.A.II- DSC-2718

Objectives of course:

The objective of this paper is to enable the student to Understand and adequate with the cultural developments of Mughal India with the help of available monuments. Also, this paper throw lights on various aspects of Sufi and Saint tradition.

Learning outcomes:

By the end of this course, it is expected that the student will be able
 CO I: To get acquainted with urban centres during the Mughal Period
 CO II: To discuss the silent features of cultural developments of during Mughal era.
 CO III: To critically evaluate the Mughal Maratha relations.
 CO IV: To determine the religious harmony spread by Suffi and Saints in Mughal era.

Module No.	Name of Unit	Teaching Hours	Credits
1.	<u>Module. I Urban Centres</u> a) Urban economy, crafts industries, Imperial Karkhanas & Textile b) Urban social structure, merchant communities, craftsman and labour	15	1
2.	<u>Module. II Cultural Developments</u> a) Visual: Paintings, Sculpture b) Performing Art: Music, Dance, Vocal c) Mughal Architecture	15	1
3.	<u>Module. III Mughal Maratha Relation</u> a) Chh. Shivaji Maharaj b) Chh. Sambhaji Maharaj c) Chh. Rajaram Maharaj d) Chh. Tarabai	15	1
4.	<u>Module. IV Religion & Culture</u> a) Sufis b) Saint Tradition , Vaishnavism	15	1
	Total	60	4

Reference Books:

1. Ali, M. Athar, - Mughal Nobility under the Aurangzeb, Asia Publication, Mumbai, 1970.
2. Khan, A.R.- Chieftains in the Mughal Empire during the reign of Akbar, IAS, Simla, 1977.
3. Habib , Muhammad – Politics and Society in early Medieval period Vols. I & II
4. Chitnis, K.N.,- Glimpses of Medieval Indian Ideas and Institutions.
5. Catherine, Asher – Architecture of Mughal India, Cambridge, 1992.
6. Arasaratnam, S. Martime – India in the Seventeen Century, OUP, New Delhi, 1994.
7. Dasgupta, Ashin – Indian Merchants and the Decline of Surat, C. 1700-1750, Manohar Pub., New Delhi, 1994.
8. Irfan Habib, Medieval India
9. Chitnis, K.N.- Social- Economic Aspects of Medieval India, Pune, 1974.
10. Hassan, Narul S – Thoughts on Agrarian Relations in Mughal India, PPH, New Delhi, 1973.

Marathi References

- i. K. N. Chitnis , Madhyayugin Bharatiya Sankalpana va Sanstha
- ii. Murland , Akbar te Aurangzeb
- iii. Dr. S. P. Shinde, Prof. Vishwnath Pawar, Mughalkalin Bhartacha Itihas, Phadke
Prakashan, Kolhapur-2012
- iv. Kshattivar , Madhyayugin Bharat
- v. Dhavale Bargal, Madhyayugin Bharat
- vi. A. R. Kulkarni , Marathyacha Itihas
- vii. V. K. Rajvade , Marathyanchya Itihasachi Sadhne
- viii. P.V. Kate , Madhyayugin Bhartacha Itihas

Vivekanand College , Kolhapur (Autonomous)

History of Modern India (1757-1857)-I

Syllabus for M.A. II. History (Hons) w.e.f. 2023-24

M.A.II- DSC-2713

Course Description:

The course "History of Modern India (1757-1857)" explores the major events, movements, and transitions that occurred in India during the period from 1757 to 1857. It focuses on the political, social, economic, and cultural developments that shaped India's modern history, including the British colonial rule, the rise of Indian nationalism, and the early stages of the freedom struggle.

Course Objectives:

After learning this course students will be able to:

CO I: Familiarize with modern concepts and approaches in history.

CO II: Understand the various sources of modern Indian history.

CO III: Criticize the nature of British Administration

CO IV: To examine the impact of British colonialism on Indian society.

Module No.	Name of Unit	Teaching Hours	Credits
1.	Understanding Modern India (1757-1857) c) Feudalism, Mercantilism, Colonialism d) Imperialism, Capitalism, Democracy e) Communalism, Neo-Marxism, Socialism, Orientalism	15	1
2.	Module 2: Sources of Modern India a. Archival Records, Official Publications, Private Correspondence and Diaries. b. Newspapers and Journals, Travelogues and Memoirs, Court Cases and Legal Documents. c. Religious Texts and Scriptures, Art and Architecture, Oral Histories and Folklore, Secondary Sources	15	1
3.	Module 3: British Administration a. Provincial Administration b. Land Revenue System c. Education d. Judicial System	15	1
4.	Module 4: Society during Colonial India a. Social Condition, Slavery b. Rural Community c. Urban Society, Rise of Middle Class d. Cristian Missionaries	15	1
	Total	60	4

Vivekanand College , Kolhapur (Autonomous)
History of Modern India (1757-1857)-II
Syllabus for M.A. II. History (Hons) w.e.f. 2023-24

M.A.II- DSC-2719

Course Objectives:

After learning this course students will be able to:

CO I: Pursue and evaluate the laws regulating and charter acts during company era.

CO II: Explore the socio-religious reformation movement during colonial era.

CO III: discuss the nature of rural agriculture economy.

CO IV: Examine and criticise the development of trade and commerce during colonial India.

Module No.	Name of Unit	Teaching Hours	Credits
1.	Laws During Company Era a. Regulating Act 1773 b. Charter act -1813 c. Charter act -1833 d. Charter act -1853 e. India Council Act- 1858	15	1
2.	Socio- Religious Reformation Movement a. Rajaram Mohan Roy- Bramho Samaj b. Swami Dayanand Sarasvati -Aarya Samaj c. Swami Vivekanand- Ramkrishna Mission	15	1
3.	Agriculture Economy a. Rural Economy: Agriculture, Crop Pattern, Irrigation b. Commercialization of Agriculture -causes & impact c. Land Revenue Systems: Zamindari, Permanent Settlement Act, Rayatvari, Mahalvari	15	1
4.	Trade & Commerce a. Industry- Cotton, Steel and Other b. Trade & Commerce c. Import & Export d. Establishment of Trade organizations	15	1
	Total	60	4

References:

1. अनिल सील (1968), द इमर्जन्स ऑफ इंडियन नॅशनॅलिझम, केम्ब्रिज युनिव्हर्सिटी प्रेस.
2. डॉ. विभा आठल्ये (2004), आधुनिक भारताचा इतिहास, अंशुल पब्लिकेशन्स, नागपूर.
3. प्रा. वसंत जाधव (2004), आधुनिक भारताचा इतिहास, विद्या प्रकाशन, नागपूर
4. डॉ. राजेश कुमार (2011), आधुनिक भारत, अल्फा पब्लिकेशन्स, नई दिल्ली.

5. डॉ. एस. एस. गाठळ (2004), भारताचा इतिहास, कैलास पब्लिकेशन्स, औरंगाबाद
6. एल. पी. शर्मा (1975), आधुनिक भारत, लक्ष्मीनारायण अग्रवाल, आगरा
7. डॉ. जयसिंगराव पवार (2012), भारताच्या स्वातंत्र्य चळवळीचा इतिहास, सुधारित बारावी आवृत्ती, फडके प्रकाशन, कोल्हापूर.
8. डॉ. धनंजय आचार्य (2009), भारताचा इतिहास (1761-1971), साईनाथ प्रकाशन, नागपूर.
9. प्रा. गणेश राऊत व प्रा. ज्योती राऊत (2005), महाराष्ट्रातील परिवर्तनाचा इतिहास (इ स 1818 ते 1960), डायमंड पब्लिकेशन्स, पुणे
10. डॉ. बी.एन. सरदेसाई , डॉ. व्ही. एन. नलावडे (2004) , आधुनिक भारताचा इतिहास, फडके प्रकाशन , कोल्हापूर
11. Sujata Menon (2015), Concise History of Modern India, Access Publishing House, New Delhi
12. Satishchandra , Historiography Religion and state in Medieval India.

Vivekanand College , Kolhapur (Autonomous)
History of Modern India (1787-1920)-I
Syllabus for M.A. II. History (Hons) w.e.f. 2023-24

M.A.II- DSC-2714

The purpose of the course is to enable the student to Understand the important developments in the Modern Indian History in historiographic approach.

Course Outcomes: After learning this course students will be able to

CO1: To examine the Establishment and Expansion of British East India Company

CO2: To criticize 1857 Revolt and its consequences

CO3: To study & examine the rise of Indian Nationalism & Establishment of Indian National Congress

CO4: To get acquainted with salient features of Age of Tilak

Module No.	Name of Unit	Teaching Hours	Credits
1.	Establishment and Expansion of British East India Company 1. Plassy war 2. Baxuar War 3. Mysore War's (Haider Ali, Tipu Sultan)	15	1
2.	1857 Revolt 1. Causes 2. Nature , Scope, Causes for defeat of rebels 3. Impact & Queens Proclamation	15	1
3.	Nationalism (1885-1905) 1. Causes of rise of Indian Nationalism 2. Establishment & First Session 3. Indian National Congress- Moderates	15	1
4.	Age of Tilak (1905-1920) 1. Extremist- Ideology 2. Causes of rise of Extremist 3. Chatusutri & Home Rule Movement	15	1
	Total	60	4

Vivekanand College , Kolhapur (Autonomous)
History of Modern India (1787-1920)-II
Syllabus for M.A. II. History (Hons) w.e.f. 2023-24

M.A.II- DSC-2720

Course Outcomes: After learning this course students will be able to

CO I: To criticize Mahatma Gandhi's contribution in Indian Freedom Struggle

CO II: To study the highlights of Revolutionary Movements and its consequences

CO III: To determine other stands of freedom movement.

CO IV: To discuss the partition and Independence of India

Module No.	Name of Unit	Teaching Hours	Credits
1.	Gandhian Era a. Gandhian Philosophy, Early Satyagraha in South Africa b. Non-Cooperation Movement c. Civil Disobedience Movement d. Quit India Movement	15	1
2.	Revolutionaries in Maharashtra a. Causes of Revolutionary Movement b. Vasudev Balwant Phadke c. V.D. Sawarkar	15	1
3.	Other Strands of Freedom Movement a. States People Movement in Maharashtra (Kolhapur & Jath) b. Subhash Chandra Bose and Indian National Army	15	1
4.	Partition and its aftermath a. Concept of communalism b. Partition – causes & effects c. Integration of Princely States: Hyderabad, Junagad, Kashmir d. Understanding Acts of 1909, 1919,1935 & it's impact	15	1
	Total	60	4

ESSENTIAL READINGS

1. Arun Bhattacharaji , *A History of Modern India*
2. Bipan Chandra, *Nationalism and Colonialism in Modern India*, 1979.
3. Bipan Chandra, *Rise and Growth of Economic Nationalism in India*.
4. D. C. Gupta , *Indian National Movement and Constitutional Development*
5. Ed.Dr. Arun Bhosale, Dr. Chausalkar & Dr. Tarodi, *Freedom Movement in Princely States of Maharashtra*
6. R.C. Majumdar, H.C. Rayachaudhari & K. Datta, *An Advanced History of India*
7. Mohandas K. Gandhi, *An Autobiography or The Story of My Experiments with Truth*
8. Mushirul Hasan, ed., *India's Partition*, Oxford in India Readings.
9. John R. McLane, *Indian Nationalism and the Early Congress*.
10. Sumit Sarkar, *Modern India, 1885-1947*.
11. Anil Seal, *Emergence of Indian Nationalism*.
12. Acharya S. D. Javadekar
13. Dr. Jayashighrao Pawar, *Freedom Struggle of Hindustan*
14. Y.N. Kadam , (2005), *Modern India*, Phadke Publication, First Edition, Kolhapur
15. Kadam,Bhide, *History of Indian Freedom Movement*

Vivekanand College , Kolhapur (Autonomous)
Syllabus for M.A. III. History (Hons) w.e.f. 2023-24
India Since Independence-I

M.A.II- DSC-2715

Objectives of course:

This is an introductory paper aimed to promote a broad understanding of major developments in post independent India with the help of study of political parties and contribution of Prime Ministers. Also, this paper will focus on development of land ceiling acts, zamindari abolition acts, green revolution and agrarian struggles in India.

Learning outcomes: By the end of this course, it is expected that the student will be able to

CO I: Examine the transformation of congress into a political party.

CO II: Criticize the internal policy and foreign policy of Prime Ministers of India.

CO III: Get acquainted with emergency, its nature, scope and impacts.

CO IV: Study agrarian reforms in post independent India.

Module No.	Name of Unit	Teaching Hours	Credits
1.	<u>Module. I Political Parties in brief : Congress-I</u> a) Pandit Nehru b) Indira Gandhi	15	1
2.	<u>Module. II Political Parties in brief : Congress-II</u> a) Rajiv Gandhi b) P. V. Narsimharao	15	1
3.	<u>Module III. Other political parties in brief</u> a) Janata Party: Morarji Desai b) Janata Dal: V. P. Singh c) BJP: Atal Bihari Vajpayee	15	1
4.	<u>Module. IV Agriculture (1947-1991)</u> a) Land reforms: Zamindari Abolition, Land Ceiling, Bhoodan Movement b) Green revolutions c) Agrarian struggles: Telangana (Andra Pradesh) , Shetkari Sanghatana (Maharashtra)	15	1
	Total	60	4

Vivekanand College , Kolhapur (Autonomous)
India Since Independence-II

M.A.II- DSC-2721

Objectives of course:

This is an introductory paper aimed to promote a broad understanding of major developments in post independent India with the help of study of post independent Indian Economy and Foreign Policy. Also, this paper will focus on environmental and social movements in India.

Learning outcomes: By the end of this course, it is expected that the student will be able to
CO I: Examine the changing facets of post independent Indian economy with the help of five-year plans.

CO II: Criticize the foreign policy of India.

CO III: Discuss emergency and its impact on Indian polity.

CO IV: Get acquainted with socio-environmental and political movements in India.

Module No.	Name of Unit	Teaching Hours	Credits
1.	<u>Module. I Post Independent Economy</u> a) Five year Plans b) Industrial Development: Cotton, Steel and Cement c) Trade: Import & Export	15	1
2.	<u>Module II. Foreign policy</u> a) Principles of Indian Foreign Policy b) Non alignment movement c) India's role in international politics: U.S.A and U.S.S.R	15	1
3.	<u>Module. III. Problems</u> a) Students unrest: Nav Nirman Andolan b) Emergency, role of Jaiprakash Narayan c) Terrorism in Punjab	15	1
4.	<u>Unit IV. Movements</u> a) Environmental Movement b) Women's movements: Manjushri Sarda Case and Bhavridevi Case c) Movements of Depressed Classes: Namantar Chalval	15	1
	Total	60	4

Reference books:

- 1) Bipan Chandra, Mridula Mukherjee, Aditya Mukherjee, India since independence, Penguin Books, New Delhi , 2000
- 2) P S Joshi , S. V. Gholkar , History of Modern India from 1800 to 1964, S Chand Publication, New Delhi,1983
- 3) Rajni Kothari, Politics in India, New Delhi, 1970
- 4) Francine R. Frankel, India's Political Economy, 1947-1977, Delhi, 1978
- 5) Kedarnath Prasad Indian Economy Since Independence: A 50 years' Profile, National Publishing House, 1997
- 6) Rajni Kothari, Politics in India, New Delhi, 1970
- 7) Yogendra Singh, Social Change in India, New Delhi, 1993
- 8) A C Chatterji: India's Foreign Policy

Marathi References:

- i. Y. N. Kadam, Dr. Arun Bhosle, Swatrantyottar Bharat I & II , Phadke Prakashnan, Kolhapur, 2015
- ii. Y. N. Kadam , Adhunik Bhartacha Itihas, Phadke Prakashan, Kolhapur 2013
- iii. Dr. Suman Vaidya Shanta Kotekar, Swatantr Bhartacha Itihas, Nagpur., 1988
- iv. Dr. G. V. Kayande Patil, Krushi Arthashastra, Chaitnya Publication, Nashik
- v. Dr. Desai , Dr. Bhalerao, Bharatiya Arthvyavstha
- vi. Y. N. Kadam, Antarrashtriya Rajkaranat Bharat, Phadke Prakashan , Kolhapur,2009

Vivekanand College, Kolhapur (Autonomous)

Women in Indian History-I

Syllabus for M.A. II. History (Hons) w.e.f. 2023-24

M.A.II- DSC-2715

Course Outcomes: After learning this course students will be able to

Course Description:

The course "Women in Indian History" examines the role, contributions, and experiences of women in different periods of Indian history. It explores the social, cultural, economic, and political factors that shaped women's lives and the challenges they faced. Through a combination of lectures, readings, discussions, and assignments, students will gain a comprehensive understanding of the significant contributions and struggles of women in Indian society.

Course Outcomes:

After learning this course students will be able to:

CO I: Understand with the definition, origin and approaches of Feminism in Indian context.

CO II: Determine the various kinds of sources which throw lights on women in Indian history.

CO III: Examine the women's position during ancient India.

CO IV: Compare the women's situation during various dynasties of Medieval India.

Module No.	Name of Unit	Teaching Hours	Credits
1.	Introduction to Women's History in India a. Feminism: Definition, Origin & Evolution b. Approaches and methodologies in studying women's history : Liberal, Marxist, Radical, Post Modern	15	1
2.	Module 2. Sources a. Archival: Govt Files, official reports, Census, Private Papers b. Non-Archival: Sacred, Non Sacred, epigraphy, Diaries, Memories, Autobiographies, Fictions, Songs, Folk Lore, Oral History & Photographs	15	1
3.	Women in Ancient India a. Women in Vedic society and the position of women in early Hindu texts b. Role of women in political, religious, and social spheres c. Challenges and restrictions faced by women in ancient India	15	1
4.	Women in Medieval India a. Hindu Period (650 to 1310) b. Sultanate Period (1206 to 1526) c. Mughal Period (152 to 1707)	15	1
	Total	60	4

Vivekanand College , Kolhapur (Autonomous)
Women in Indian History-II

Syllabus for M.A. II. History (Hons) w.e.f. 2023-24

M.A.II- DSC-2721

Course Outcomes: After learning this course students will be able to

CO I: Elaborate the religious context of women

CO II: Discuss the socio, economic and educational condition of women during 19th century.

CO III: Evaluate the women reformers and their reformation during 19th century.

CO IV: Criticize the contribution of women in Indian Freedom Struggle.

Module No.	Name of Unit	Teaching Hours	Credits
1.	Religion and Women a. Brahmical Tradition b. Jainism c. Buddhism d. Islam e. Christianity f. Bhakti Movement	15	1
2.	Women's condition during 19th Century a. Women's social condition- Satipratha, Child Marriage, Devdasi & Women Slavery b. Women Education & Economic Condition c. Acts of women emancipations during British Era	15	1
3.	Women Reformation a. Rajaram Mohan Roy, Mahatma Phule b. Savitribai Phule, Pandita Ramabai , Ramabai Ranade	15	1
4.	Contribution of Women in Indian Freedom Movement a. 1857 Revolt b. Gandhian Mass Movement c. Women Revolutionary d. Azad Hind Sena	15	1
	Total	60	4

References:

1. Rehana Ghadially (2007), *Urban Women in Contemporary India*, Sage Publication, First Edition, New Delhi.
2. Narayan Laxmi (2015), *Human Rights for Women, Issues and Perspectives*, DND Publications, Jaipur.
3. Anuradha Biswas (2013), *Women Rights and Privileges in India*, Arise Publishers & Distributors, New Delhi.
4. Altekar A.S. (1978), *The Position of Women in Hindu Civilization*, Motilal Banarasidas, Delhi
5. Bagachi Jasodhara (1977), *Indian women Myth and Reality*, Sangam Books, Hyderabad.
6. Mujumdar R.C. (1984), *The Delhi Sultanate*, Bhartiya Vidya Bhavan, Bombay.
7. खडपेकर विनया (1991), स्त्री स्वातंत्र्यवादिनी , विसाव्या शतकातील परिवर्तन, पॉप्युलर प्रकाशन, मुंबई.
8. डॉ.सौ पद्मजा पाटील , डॉ सौ शोभना जाधव (2007), भारतीय इतिहासातील स्त्रिया, फडके प्रकाशन, कोल्हापूर
9. आधुनिक भारत की नारी – डॉ ममता गंगवार
10. गव्हाणे शुभांगी (2003), स्त्री परिवर्तनाची आव्हाने, साऊथ एशियन सोशल रिसर्च पब्लिकेशन, औरंगाबाद .
11. गांधी नंदिता, शाह नंदिता (1994), स्त्री संघर्षाची नवी रूपे, पॉप्युलर प्रकाशन, मुंबई.
12. संगवे विलास (1979), भारतातील सामाजिक समस्या, पॉप्युलर प्रकाशन,
13. डॉ.एस.एस.गाठाळ (2013), भारतीय इतिहासातील स्त्रिया व स्त्री जीवन, कैलास प्रकाशन, औरंगाबाद.
14. नीलम गोन्हे (संपा) - नव्या शतकातील महिला धोरणे व अंमलबजावणी.
15. गव्हाणकर रोहिणी (1998), कॅप्टन लक्ष्मी व राणी झाशी रेजिमेंट, साधना प्रकाशन, पुणे.



“Education for Knowledge, Science and Culture”

-Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's



VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

M.A.II - History (2023-24)

Sem. I & Sem. II

Structure of Question Paper

Discipline Specific Course

Total Marks = 50

Time=2.00 hours

* All Questions are compulsory (Based on all Modules)

Q.1	A. Multiple Choice Questions	05 Marks
	B. Match the Pairs	05 Marks
Q.2	A. Broad Answer Question	10 Marks
	B. Broad Answer Question	10 Marks
Q.3	Short notes (Any 2)	10 Marks
	Total	40 Marks

Internal Evaluation: 10 Marks

Sr. No	Evaluation Type	Marks
1.	Home Assignment/ Book Review/ Historic Movie Summary/ Unit Test	10
	Total	10 Marks

“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF COMMERCE

M. Com. Part - II

Semester-III&IV

SYLLABUS

Under Choice Based Credit System

To be implemented from Academic Year 2019 - 2020

CHOICE BASED CREDIT SYSTEM
M.Com - II (Sem -III and IV) COMMERCE
Course Structure
to be implemented from 2019-2020

Semester-III		
Course Code	Course Title	No. of Credits
CP-1217C	Business Finance Paper -I	04
CP-1218C	Management Accounting Paper -I	04
CBP-1219C	Advanced Accountancy-V (Cost Accounting)	04
CBP-1222C	Advanced Accountancy Paper- VI (Research Methodology)	04
Semester IV		
Course Code	Course Title	No. of Credits
CBP-1225-D	Business Finance Paper-II	04
CBP-1226-D	Management Accounting Paper - II	04
CBP-1227 D	Advanced Accountancy-VII (Financial Management)	04
CBP-1230D	Advanced Accountancy Paper- VIII Project Work & Viva-Voce	04

M. Com. Part - II CBCS
Semester - III
Business Finance Paper -I (CP-1217C)
Theory: 80Teaching Hours Credits - 4

Course Outcome : After Completion of this course student will be able to:

- CO1: Understand core concepts, its environment and functions of business finance
- CO2: Know capital structure & concept of capitalization
- CO3: Identify sources of business finance and application
- CO4: Estimate the working capital required

Module	Title	Teaching hours
Module I A) Theory	Environment of Business Finance: (a) Business Finance and Financial goal: Concept, scope and significance of Business Finance. (b) Financial goal: Profit Maximization Vs Wealth Maximization, Relationship of finance with other areas of management. (c) Finance Functions: Managerial Functions- Investment decision, Finance decision, Dividend decision and liquidity decision and Routine Functions. (d) Capitalization: Concept and theories of Capitalization. Over-capitalization and Under-capitalization: Concept, symptoms, causes, effects and remedies.	(15)
Module II A) Theory	Capital Structure: (a) Capital Structure: Meaning and cardinal principles of Capital Structure: Cost, Risk, Control, Flexibility and Timing. (b) Factors influencing the capital structure. Weighted Average cost of capital (WACC).	(15)
Module III A) Theory	Sources of Finance: (a) Equity Shares, Sweat Shares, Employee's Stock Option (ESOP), Equity Shares with differential rights, Preference Shares. (b) Debentures and Term: Loans: Meaning, characteristics, merits, demerits and legal provisions. (c) Venture Capital: Concept, process, merits and demerits & Private equity (d) Lease Finance: Concept, parties, mechanism and types.	(15)

	(e) Project Finance: Concept, features and main parties.	
Module IV	Working Capital Management:	
A) Theory	(a) Working Capital: Concept, types and significance. Factors, Determining working capital requirements. (b) Sources of Working Capital: Accruals, trade credit, commercial banks, public deposits, inter-corporated deposits, short-term loans from financial institutions, commercial paper (CP) and factoring. (c) Working Capital Management: Management of Cash, Liquidity, Receivables and Inventory.	(15)

Reference Books:

1. Financial Management-Rajiv Shrivastava and Anil Misra, Oxford University Press, New Delhi.
2. Financial Management- Dr. Anil Kumar Dhagat, Kognet Learning Solutions Inc., Dreamtech Press, New Delhi.
3. Finance for Non-finance Executives, Prasanna Chandra, Tata McGraw Hill Education Pvt. Ltd., New Delhi.
4. Essentials of Business Finance- Dr. R.M. Shrivastav
5. Corporation Finance- S.C. Kuchhal.
6. Corporate Finance Policy- Guthmann and Dougall.
7. Readings in Indian Financial Services- Digvijay.
8. Corporate Finance- Brealey, Richard A. & Steward C Myers.
9. Financial Services in India- M.A. Kohok.
10. Financial Management Taxmann-Ravi M. Kishore, Allied Services Pvt. Ltd. New Delhi.
11. Financial Management -Prassanna Chandra, TMH, New Delhi.
12. Financial Institutions and Markets -Bhole L.M., TMH, N. Delhi.

Nature of Question Paper

Marks: 80

Duration: 3 hours.

Instructions:

- 1) Q. No. 1 and 2 are compulsory
- 2) Attempt any three questions from Q. No. 3 to 6
- 3) Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	08
	Fill in the Blanks	04
	State 'True' or 'False'	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Long answer	16
Que.4	Long answer	16
Que.5	Long answer	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - III
Management Accounting Paper -I (CP-1218C)
Theory: 80Teaching Hours Credits - 4

Course Outcomes: After successful completion of the course student will be able to:

- CO1: understand the concept of Management Accounting.
- CO2: know the use of ols and techniques of Management accounting in Business.
- CO3: know the techniques of Ratio Analysis.
- CO4: understand the concept of working capital and Fund flow Statement.

Module	Content	Teaching Hrs
I	Introduction- Meaning of Management Accounting, Nature, Role of Management accounting in decision making, Management accounting v/s Financial accounting, Tools and techniques of management accounting.	15
II	Financial Statement Analysis - Techniques of Financial Statements Analysis, Ratio Analysis, advantages and limitations of accounting ratios, Classification of Ratios and Preparation of financial Statements from ratio.	15
III	A) Working Capital Meaning Significance and determinants of working capital, operating cycle, Type of working capital, Estimation of working capital and preparation of financial statements. B) Responsibility Accounting and Performance Measurement -Concept of Responsibility Accounting, Advantages of Responsibility Accounting, Problems in Responsibility Accounting, Reporting. Responsibility Centers - Cost Centre, Revenue Centre, Profit Centre, Investment Centre, Performance	15

	Measurement (Problems on performance measurement)	
IV	a) Meaning of Fund and Funds Flow Statement, Identifying of flow of funds, Preparation of Funds Flow Statement. b) Meaning of Cash Flow Statement, Cash and cash equivalents, Preparation of Cash Flow Statement. (AS-3)	15

Reference Books

1. Khan M.Y. and Jain P.K. Management accounting, Tata McGraw Hill, New Delhi
2. Charles T.Horngren, Introduction to management Accounting, Prentice Hall of India, New Delhi.
3. Horngren, Charles T. George Foster and Shrikant M. Daliar : Cost Accounting : A Managerial Emphasis, Prentice Hall, Delhi
4. Pandey I. M. Management Accounting, Vani Publication, Delhi. '
5. Welsch Glenn A., Ronald W. Hilton and Paul N. Gordon : Budgeting, Profit Planning and control, Prentice Hall, New Delhi.
6. Manmohan&Goyal : Principles of Management Accounting
7. Maheshwari: Principles of Management Accounting
8. Robet Anthony and Vijay Govindrajan - Management Control System
9. H. V. Jhamb, Fundamentals of Management Accounting, Ane Books Pvt. Ltd.

Marking scheme:

- I. Internal Assessment 20 Marks**
- II. External Assessment 80 Marks**

NATURE OF QUESTION PAPER
M.Com II
Management Accounting Paper I & II

Duration: 3 Hours

Total Marks - 80

Instructions: -1) Question No.1 & Q. No.2 are Compulsory.

2. Attempt any Three Question from Q. No.3 to 6.

Question	Nature of Question	Marks
Question No 1	a) Choose correct Alternative	8 Marks
	b) Fill in the Blanks	4 Marks
	c) State True or False	4 Marks
Question No 2	a) Broad Question	8 Marks
	b) Broad Question	8 Marks
	OR	
	Short Notes (any four out of six)	16 Marks
Question No 3	Problem	16
Question No 4	Problem	16
Question No 5	Problem	16
Question No 3	Problem	16
Total		80

M. Com. Part - I CBCS
Semester - III
Advanced Accountancy Paper- VI (Research Methodology) (CBP-1222C)
Theory: 80Teaching Hours Credits - 4

Course Outcome	After completion of this course student will be able
CO 1	understand the conceptual framework of scientific Methods in Research
CO 2	develop the skills and apply the process of research in Project report writing
CO 3	Explain the types of research design and good research design.
CO 4	know the types of data, collection of data and use of computers in research.

Module	Content	Teaching Hrs
I	Fundamentals of Research Methodology- Meaning, Definitions, Objectives and Significance Research in Commerce and management, Characteristics of good research, Types of Research - On the basis of nature of information, subject matter, approach and method of research. Methods of research - Survey method, case study Method	15
II	Research design- Meaning and Features of good research Design Types of Research design- Exploratory, Descriptive, Diagnostic and Experimental Research process Hypothesis- Concept, Null and Alternative Hypothesis, Formulation of hypothesis	15
III	Data Collection and sample Design- Meaning of data, types of data (Qualitative and Quantitative), Source of Data Methods of data collection-	15

	Primary Data Collection- Questionnaire and Schedule, types of Questionnaire and schedule, difference between Questionnaire and Schedule Secondary Data- sources Analysis of Data- Classification, Tabulation, Interpretation Sample Design- Meaning and Significance Types of sample Design- Simple random, Systematic, Stratified, Deliberate, Quota, Multi Stage sampling	
IV	Report Writing and Use of Computers in Research- Layout of project report, contents of chapter Use of Computer in Research - importance and significance, use of MS-Excel, SPSS, Graphical Presentation.	15

Reference Books:

1. Michael V.P., 'Research Methodology in Management', Himalaya Publishing House, New Delhi.
2. Krishnaswami O.R. and Ranganatham M., 'Methodology of Research in Social Sciences', Himalaya Publishing House, New Delhi.
3. Kothari C.R., 'Research Methodology - Methods and Techniques', New Age International Publishers.
4. Pauline V. Young, 'Scientific Social Surveys and Research', Prentice-Hall of Indian Pvt. Ltd., New Delhi.
5. Sachdeva J.K., Business Research Methodology, Himalaya Publishing House, 2nd revised, 2011.
6. Gupta S.P., Statistical Methods, Sultan Chand & Sons.

Marking Scheme:-

1. Theory exam- 80 marks
2. Internal exam- 20 marks

NATURE OF QUESTION PAPER

M.Com II

Advanced Accountancy Paper- VI (Research Methodology)

Duration: 3 Hours

Total Marks - 80

Instructions:1) Q. No. 1 and 2 are compulsory.

2) Attempt any three questions from Q. No. 3 to 6.

3) Figures to the right indicate full marks.

Question	Nature of Question	Marks
1. A.	Multiple Choice Questions (8 MCQ)	8
B.	Fill in the Blanks (4 Fill in the Blanks)	4
C.	State 'True' or 'False' (4 Statements)	4
2.	Short Answers (Any two out of three)	16
3.	Long Answer	16
4.	Long Answer	16
5.	Long Answer	16
6.	Short Notes (Any two out of three)	16
Total		80

M. Com. Part - I CBCS
Semester - III Paper- I
Advanced Accountancy-V (Cost Accounting) (CBP-1219C)
Theory: 80Teaching Hours Credits - 4

COURSE OUTCOMES: By the end of this course it is expected that the student will be able:

CO1: Utilize knowledge of elements of cost in classification, allocation and apportionment of cost.

CO2: Apply knowledge of cost accounting in reconciliation and integrated system of accounting

CO3: Explain methods of pricing the issue of Materials and levels of sck.

CO4: Know the methods of costing including equivalent production.

Module	Content	Teaching Hrs.
I	Introduction and Elements of Cost: Meaning, scope and objectives of Cost Accounting, Elements of Cost- Classification of Cost, Cost Unit, Cost Centre, preparation of Cost Sheet and Quotation.	15
II	Cost Accounting of Material, Labor and Overheads: (a) Methods of pricing the issue of materials-LIFO, FIFO, Simple Average, Weighted Average, Levels of Stock, Economic Order Quantity (EOQ) (b) Methods of wages - Time Basis, Piece Basis (Theory only) Labor Turnover. (c) Classification, allocation and apportionment of overheads.	15
III	Methods of Costing: Contract Costing, Operating Costing and Process Costing, including equivalent production	15
IV	(a) Reconciliation of Cost and Financial Accounts. (b) Integrated System of Accounting.	15

Reference Books:

1. Cost Accounting -B K Bhar
2. Cost Accounting - Jain and Narang

3. Cost Accounting - S N Maheshwari
4. Cost Accounting (Problems & Solutions) – Khanna, Pandey, Arora and Ahuja.
5. Cost Accounting – Shukla, Grewal & Gupta.

Marking Scheme:

Internal Evaluation: (20 Marks)

Written Examination: (80 Marks)

NATURE OF QUESTION PAPER
M.COM II
Advanced Accountancy-V (Cost Accounting)

Duration: 3 Hours

Total Marks – 80

Instructions: 1. Question No.1 & Q. No.2 is Compulsory.

2. Attempt any Three Questions from Q. No.3 to 6.

Question	Nature of Question	Marks	
Q. No.1	a) Choose Correct Alternative	8 Marks	16 Marks
	b) Fill in the Blanks	4 Marks	
	c) State True or False	4 Marks	
Q.No.2	Write short Answer (Any two out of three)	-	16 Marks
Q. No.3	Problem	-	16 Marks
Q. No.4	Problem	-	16 Marks
Q. No.5	Problem	-	16 Marks
Q. No.6	Problem	-	16 Marks

M. Com. Part - I CBCS
Semester - III Paper- I
Business Finance Paper-II (CBP-1225-D)
Theory: 80 Teaching Hours Credits - 4

COURSE OUTCOMES: After successful completion of this course students will be able to:

- CO1: Understand the capital market.
- CO2: Know the concept and application of Mutual Funds, Portfolio Management and Micro Finance and Credit Rating in their life and organisation
- CO3: Identify causes and remedies of corporate failure and understand the concept of corporate restructuring.
- CO4: Take business decisions like make or buy shutdown or continue.

Module	Title	Teaching hours
Module I A) Theory	<p>Capital Markets:</p> <p>(a) Primary Capital Market: Meaning, role and functions, Methods of selling corporate securities in primary capital market. Underwriting of Securities.</p> <p>(b) Secondary Capital Market (Stock Exchange): Meaning, evolution of stock market in India, Role and functions of stock exchange. Trading mechanism in stock market.</p> <p>(c) SEBI and Credit Rating: Role of SEBI in regulating capital markets in India. Credit Rating: Meaning, need, credit rating agencies in India, Credit rating methodology.</p> <p>(d) Depository: Meaning, role, benefits and present position in India. National Securities Depository Limited (NSDL) and Central Depository Services India Limited (CDSL)</p>	(15)
Module II A) Theory	<p>Mutual Funds, Portfolio Management and Micro Finance:</p> <p>(a) Mutual Funds: Concept, importance, Types of Mutual Funds- -Money Market Funds, Income Funds, Bond Funds, Balanced Funds, Equity Funds, International Funds, Specialty Funds, Index Funds, Exchange-Traded Funds Present position of Mutual Funds in India.</p> <p>(b) Portfolio Management: Meaning, importance,</p>	(15)

	objectives. Various issues in portfolio construction, revision and evaluation. (c) Financial Inclusion: Meaning, need and government policy. (d) Micro-Finance: Concept, characteristics, need, present position in India.	
Module III A) Theory	Corporate Restructuring : (a) Corporate Failure: Meaning causes and remedies. (b) Corporate Restructuring: Meaning, forms- Mergers and Amalgamation, Acquisitions / Take-over, Demergers, divesture, Buy outs, Financial Restructuring, and Strategic Alliances-meaning, benefits and legal procedure.	(15)
Module IV A) Theory	Financial Decision making: (a) Project Feasibility or Viability Analysis: Concept - Free Cash Flow, Net Present Value (NPV) and Methods, Profitability Index, Pay Back Period. (b) Make or Buy Decision: Meaning, Methodology. (c) Profit maximization through optimum product mix	(15)

Reference Books:

1. Financial Management-Rajiv Shrivastava and Anil Misra, Oxford University Press, New Delhi
2. Financial Management- Dr. Anil Kumar Dhagat, Kognet Learning Solutions Inc., Dreamtech Press, New Delhi
3. Finance Sense ---Finance for Non-finance Executives, Prasanna Chandra, Tata McGraw Hill Education Pvt. Ltd., New Delhi
4. Investment and Securities Market in India- V.A.Avdhani
5. Security Analysis and Portfolio Management- Sasidharan/ Mathews
6. Security Analysis and Portfolio Management- PunithavathyPandian
7. Portfolio Management Handbook- Robert A. Strong
8. Stock Exchange and Investment- Raghunathan
9. Stock Exchange Trading in India- Gupta L.C.
10. Capital Issues, SEBI and Listing- Chandratre K.R
11. Corporate Mergers, Amalgamations & Take Over- Verma J.C.
12. Corporate Restructuring and Indian Perspective- Mattoo P.K
13. International Business-Aswthappa, TMH, N. Delhi

**Nature of Question Paper
Business Finance Paper- II**

Marks: 80

Duration: 3 hours.

Instructions:

- 4) Q. No. 1 and 2 are compulsory
- 5) Attempt any three questions from Q. No. 3 to 6
- 6) Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	08
	Fill in the Blanks	04
	State 'True' or 'False'	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Long answer	16
Que.4	Long answer	16
Que.5	Long answer	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - IV Paper- II
Management Accounting Paper - II (CP-1226D)
Theory: 80 Teaching Hours Credits - 4

Course Outcome: After successful completion of the course student will be able to

CO1: Understand the concept of Management control system

CO2: Understand cost Accounting terminology and methods related Management Accounting.

CO3: Explain about applications of Marginal Costing and Decision making by using Marginal Costing.

CO4: Know the types of Budgets and budgetary Control.

Module	Content	Teaching Hrs
I	<p>Management Control System</p> <p>a) Meaning, Need, Importance and Scope of Management Control System, Management Control Process.</p> <p>b) Management Information System (MIS) - Meaning & Characteristics</p> <p>c) Reporting to Management - Types of Reports and Characteristics of good report.</p>	15
II	<p>A) Marginal Costing:</p> <p>Meaning and application of marginal costing, Break, even analysis, Cost Volume- Profit analysis,</p> <p>B) Decision making</p> <p>Decision making by using marginal costing - Make or buy decisions, shut down or continue decisions, shut down or continue decisions, Alternative course of action etc.</p>	15
III	<p>Budget and Budgetary Control :</p> <p>Meaning of Budget & Budgetary Control, Objectives, Advantages & Limitations, Types of Budgets - Production, Sales, Cash, Master Budget,</p>	15

	Fixed and Flexible budget, Capital Expenditure Budgeting, (Note: problems should be asked on cash budget and Flexible budget)	
IV	<p>A) Standard Costing: Meaning of Standard Cost and Standard Costing, Advantages and limitations, Difference between standard cost and Estimated cost.</p> <p>B) Cost Control and Cost Reduction: Meaning and nature of cost Management, Cost control and Cost Reduction, Process and techniques of cost control, Techniques of cost reduction, Types of Control Ratios.(With practical)</p>	15

Reference Books

1. Khan M.Y. and Jain P.K. Management accounting, Tata McGraw Hill, New Delhi
2. Charles T.Horngren, Introduction to management Accounting, Prentice Hall of India, New Delhi.
3. Horngren, Charles T. George Foster and Shrikant M. Daliar : Cost Accounting : A Managerial Emphasis, Prentice Hall, Delhi
4. Pandey I. M. Management Accounting, Vani Publication, Delhi. '
5. Welsch Glenn A., Ronald W. Hilton and Paul N. Gordon : Budgeting, Profit Planning and control, Prentice Hall, New Delhi.
6. Manmohan&Goyal : Principles of Management Accounting
7. Maheshwari: Principles of Management Accounting
8. Robet Anthony and Vijay Govindrajan - Management Control System
9. H. V. Jhamb, Fundamentals of Management Accounting, Ane Books Pvt. Ltd.

I. Internal Assessment: 20 Marks

II. External Assessment- 80 Marks

NATURE OF QUESTION PAPER

M.Com II

Management Accounting Paper I & II

Duration: 3 Hours

Total Marks - 80

Instructions: -1) **Question No.1 & Q. No.2 are Compulsory.**

2. Attempt any Three Question from Q. No.3 to 6.

Question	Nature of Question	Marks
Question No 1	d) Choose correct Alternative	8 Marks
	e) Fill in the Blanks	4 Marks
	f) State True or False	4 Marks
Question No 2	c) Broad Question	8 Marks
	d) Broad Question	8 Marks
	OR	
	Short Notes (any four out of six)	16 Marks
Question No 3	Problem	16
Question No 4	Problem	16
Question No 5	Problem	16
Question No 3	Problem	16
Total		80

M. Com. Part - II CBCS
Semester - IV
Advanced Accountancy-VII (Financial Management) (CBP-1227D)
Theory: 80 Teaching Hours Credits - 4

COURSE OUTCOMES: By the end of this course it is expected that the student will be able to:

CO1: Understand procedure of capital structure decisions in corporate secr.

CO2: Understand motives and benefit and procedure of corporate restructuring.

CO3: Explain the types of cost of capitals.

CO4: Know the Capital Structure decisions and types of Leverages.

Module	Content	Teaching Hrs.
I	Introduction to Financial Management: Introduction - Meaning and Scope- Finance Functions, Objectives of Financial Management. Role of Finance Manager.	15
II	Capital Structure Decisions: Net Income Approach, Net Operating Income Approach, Traditional Approach and Modigliani-Miller Approach. Leverages- Financial, Operating and Combined. EBIT- EPS Analysis.	15
III	Cost of Capital: Cost of Debt, cost of Preference Shares, Cost of Equity, Cost of Retained Earnings. Weighted Average Cost.	15
IV	Corporate Restructuring: Merger and Acquisition - Motives and Benefits, Merger Negotiations - Significance of P/E Ratio and EPS Analysis.	15

Reference Books

1. Introduction to Financial Management - I M Pandey
2. Financial Management - Prasanna Chandra
3. Financial Management - Khan and Jain

4. Financial management - Ravi M Kirhare
5. Cost Accounting and Financial management - Tulsian
6. Financial Management - P V Kulkarni
7. Financial Management - S C Saxena
8. Financial Management - Hogland.

INTERNAL EVALUATION: (20 Marks)

WRITTEN EXAMINATION: (80 Marks)

**NATURE OF QUESTION PAPER
M.COM II**

Advanced Accountancy-VII (Financial Management)

Duration: 3 Hours

Total Marks: 80

Instructions: 1. Question No.1 & Q. No.2 is Compulsory.

2. Attempt any Three Questions from Q. No.3 to 6.

Question	Nature of Question	Marks	
Q. No.1	a) Choose Correct Alternative	8 Marks	16 Marks
	b) Fill in the Blanks	4 Marks	
	c) State True or False	4 Marks	
Q.No.2	Write short Answer (Any two out of three)	-	16 Marks
Q. No.3	Problem	-	16 Marks
Q. No.4	Problem	-	16 Marks
Q. No.5	Problem	-	16 Marks
Q. No.6	Problem	-	16 Marks

**M. Com. Part - II CBCS
Semester - IV**

**Advanced Accountancy Paper- VIII (Project Work & Viva-Voce)
(CBP-1230D)**

Theory: 80 Teaching Hours Credits - 4

Course Outcome:- By the end of this course it is expected that the student will be able to :

CO1: prepare Project report by using primary and secondary data.

CO2: apply the knowledge of research methodology prepare the project report based on the field work.

CO3: prepare synopsis for research project.

CO4: come out with innovative solution for social and business related problems through research paper.

Project Work & Viva-Voce - VIII

1. Project report can be prepared on any subject or compulsory or respective optional subject incorporated in the M.com Program based on field work
2. Panel of viva-voce examination will be of three experts (one expert is internal and two are external chairman will be external experts and have to submit final marks
3. Viva -voce will be conducted at the end of academic year but before the commencement of theory examination. It will be conducted by the internal & external examiners appointed by the college.
4. 100 Marks of project work will be given collectively by the internal & external examiners and the average of these marks will be taken as final marks by external examiners after via-voce submitted to college
5. Project work will be done by the students individually
6. The project work will be consisting at least typed 50 pages.
7. Two copies of typed project reports should be submitted to the college
8. Students are required to prepare the project report based on the field work and studying the current trends in commerce and management under the guidance of the project guide. Project report can be prepared by using primary and secondary data.

Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF COMMERCE

M. Com. Part - II

Semester-III&IV

SYLLABUS

**Under Choice Based Credit System
To be implemented from Academic Year 2021- 2022**

CHOICE BASED CREDIT SYSTEM
M.Com - II (Sem -III and IV) COMMERCE
Course Structure
to be implemented from 2021- 2022
Semester-III

Course Code	Course Title	No. of Credits
CP-1217C	Business Finance Paper -I	04
CP-1218C	Management Accounting Paper -I	04
CBP-1219C	Advanced Accountancy-V (Cost Accounting)	04
CBP-1220C	Advanced Accountancy-V (Cost Accounting Record and Cost Audit)	04
CBP-1221C	Business Administration -V (Corporate Governance and Business Ethics)	04
CBP-1222C	Advanced Accountancy Paper- VI (Research Methodology)	04
CBP-1223C	Advanced Accountancy Paper- VI (Research Methodology)	04
CBP-1224C	Advanced Accountancy Paper- VI (Research Methodology)	04
Course Code	Course Title	No. of Credits
CBP-1225-D	Business Finance Paper-II	04
CBP-1226-D	Management Accounting Paper - II	04
CBP-1227-D	Advanced Accountancy Paper-VII	
CBP-1228-D	Advanced Costing Paper-VII	
CBP-1229-D	Business Administration Paper-VII	
CBP-1227 D	Advanced Accountancy-VII (Financial Management)	04
CBP-1230D	Advanced Accountancy Paper- VIII Project Work & Viva-Voce	04

M. Com. Part - II CBCS
Semester - III
Business Finance Paper -I (CP-1217C)
Theory: 80Teaching Hours Credits - 4

Course Outcome After completion of this course student will be able to:

- CO1: Understand core concepts, its environment and functions of business finance
- CO2: Know capital structure & concept of capitalization
- CO3: Identify sources of business finance and application
- CO4: Estimate the working capital required

Module	Title	Teaching hours
Module I A) Theory	<p>Environment of Business Finance:</p> <p>(a) Business Finance and Financial goal: Concept, scope and significance of Business Finance.</p> <p>(b) Financial goal: Profit Maximization Vs Wealth Maximization, Relationship of finance with other areas of management.</p> <p>(c) Finance Functions: Managerial Functions- Investment decision, Finance decision, Dividend decision and liquidity decision and Routine Functions.</p> <p>(d) Capitalization: Concept and theories of Capitalization. Over-capitalization and Under-capitalization: Concept, symptoms, causes, effects and remedies.</p>	(15)
Module II A) Theory	<p>Capital Structure:</p> <p>(a) Capital Structure: Meaning and cardinal principles of Capital Structure: Cost, Risk, Control, Flexibility and Timing.</p> <p>(b) Factors influencing the capital structure. Weighted Average cost of capital (WACC).</p>	(15)
Module III A) Theory	<p>Sources of Finance:</p> <p>(a) Equity Shares, Sweat Shares, Employee's Stock Option (ESOP), Equity Shares with differential rights, Preference Shares.</p> <p>(b) Debentures and Term: Loans: Meaning, characteristics, merits, demerits and legal provisions.</p> <p>(c) Venture Capital: Concept, process, merits and demerits & Private equity</p> <p>(d) Lease Finance: Concept, parties, mechanism and types.</p> <p>(e) Project Finance: Concept, features and main parties.</p>	(15)

Module IV	Working Capital Management:	
A) Theory	(a) Working Capital: Concept, types and significance. Factors, Determining working capital requirements. (b) Sources of Working Capital: Accruals, trade credit, commercial banks, public deposits, inter-corporatedeposits, short-term loans from financial institutions, commercial paper (CP) and factoring. (c) Working Capital Management: Management of Cash, Liquidity, Receivables and Inventory.	(15)

Reference Books:

1. Financial Management-Rajiv Shrivastava and Anil Misra, OxfordUniversity Press, New Delhi.
2. Financial Management- Dr. Anil Kumar Dhagat, Kognet LearningSolutions Inc., Dreamtech Press, New Delhi.
3. Finance for Non-finance Executives, PrasannaChandra,Tata McGraw Hill Education Pvt. Ltd., New Delhi.
4. Essentials of Business Finance- Dr. R.M. Shrivastav
5. Corporation Finance- S.C. Kuchhal.
6. Corporate Finance Policy- Guthmann and Dougall.
7. Readings in Indian Financial Services- Digvijay.
8. Corporate Finance- Brealey, Richard A. & Steward C Myers.
9. Financial Services in India- M.A. Kohok.
10. Financial Management Taxmann-Ravi M. Kishore, Allied Services Pvt. Ltd. New Delhi.
11. Financial Management -Prassanna Chandra, TMH, New Delhi.
12. Financial Institutions and Markets -Bhole L.M., TMH, N. Delhi.

Nature of Question Paper

Marks: 80

Duration: 3 hours.

Instructions:

- 1) Q. No. 1 and 2 are compulsory
- 2) Attempt any three questions from Q. No. 3 to 6
- 3) Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	08
	Fill in the Blanks	04
	State 'True' or 'False'	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Long answer	16
Que.4	Long answer	16
Que.5	Long answer	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - III
Management Accounting Paper -I (CP-1218C)

Course Outcome: After successful completion of this course, the students will be able to

CO1: Understand the fundamentals of Management Accounting.

CO2: Explain the analysis and interpretation of financial statements.

CO3: Demonstrate the estimation of working capital requirements.

CO4: Practice to analyze the changes in financial position

Module	Title	Tech. Hrs.
Module I	Introduction: Introduction of Management Accounting: Meaning of Management Accounting, Scope and Functions of Management Accounting, Role of Management Accountant in Decision Making, Management Accounting vs. Financial Accounting, Tools and Techniques of Management Accounting	(15)
A) Theory		
B) Practical	Practical- Group discussion can be conducted in the classroom on the contents of Module-I	
Module II	Analysis of Financial Statements: Meaning and Types of Financial Statements, Analysis of financial statements: Comparative Statement Analysis, Common-size Statement Analysis, Trend Analysis and Ratio Analysis- Classification of Ratios, Advantages and Limitations of Accounting ratios.	(15)
A) Theory		
B) Practical	Practical- Download financial statements of any company and analyze it with any technique of financial analysis. Also write interpretation.	
Module III	Working Capital: Meaning, Significance and Determinants of Working Capital, Operating Cycle, Types of Working Capital, Estimation of Working Capital Requirement.	(15)
A) Theory		
B) Practical	Practical- Exercise for Simulation of estimation of working capital can be arranged in the classroom.	
Module IV	Funds flow Statement and Cash Flow Statement: Meaning of Fund and Funds Flow Statement, Identifying Flow of Funds, Preparation of Funds Flow Statement, Meaning of Cash Flow Statement, Utility of Cash Flow Statement and Preparation of Cash Flow Statement(AS-3) Difference between Funds Flow Statement and Cash Flow Statement.	(15)
A) Theory		
B) Practical	Practical- a) Prepare fund flow statement on hypothetical data and try to interpret it. b) Download cash flow statement of any company and interpret it.	

Reference Books

1. Khan M.Y. and Jain P.K. Management accounting, Tata McGraw Hill, New Delhi
2. Charles T. Horngren, Introduction to management Accounting, Prentice Hall of India, New Delhi.
3. Horngren, Charles T. George Foster and Shrikant M. Daliar : Cost
4. Accounting : A Managerial Emphasis, Prentice Hall, Delhi
5. Pandey I. M. Management Accounting, Vani Publication, Delhi. '
6. Welsch Glenn A., Ronald W. Hilton and Paul N. Gordon : Budgeting,
7. Profit Planning and control, Prentice Hall, New Delhi.
8. Manmohan & Goyal : Principles of Management Accounting
9. Maheshwari: Principles of Management Accounting
10. Robert Anthony and Vijay Govindrajana - Management Control System.

Nature of Question Paper Management Accounting Paper- I

Marks: 80

Duration: 3 hours.

Instructions:

1. Q. No. 1 and 2 are compulsory
2. Attempt any three questions from Q. No. 3 to 6
3. Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	10
	Fill in the Blanks	06
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Problem	16
Que.4	Problem	16
Que.5	Problem	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - III
Advanced Accountancy- V(Cost Accounting) (CBP-1219-C)
Theory: 80Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able to-

CO1: Acquire the knowledge of elements of cost and cost sheet.

CO2: Acquaint the knowledge and skill prepare job cost sheet and contract account.

CO3: Explain the costing process for processing units and service organizations.

CO4: Understand reconcile the cost and financial accounts.

Module	Title	Tech. Hrs.
Module I A) Theory	Introduction and Elements of Cost: a) Meaning, scope, objectives and advantages of cost accounting b) Elements of Cost- Material Cost, Labour Cost and Overheads. Classification of cost, cost unit, cost center, preparation of cost sheet and quotation.	(15)
B) Practical	a) Group discussion can be conducted in the classroom on the contents of Module-I b) Collect cost data from any organization and prepare cost sheet	
Module II A) Theory	Job Costing and Contract Costing: A) Job Costing - Job Costing and Unit Costing: Meaning, Features, Practical Applications of Job Costing and Unit Costing, Preparation of Job Cost Sheet. B) Contract Costing- Contract Costing: Meaning, Features, Accounting Procedure, Retention money, Escalation Clause, Work in Progress, Cost Plus Contract. Preparation of Contract Account	(15)
B) Practical	a) Collect cost data from organization which are working on job contract basis and prepare job cost sheet b) Collect cost data from any contractor and prepare contract account for a single contract.	
Module III A) Theory	Process Costing and Service Costing: Process Costing: Meaning and its Applications, Concept of Equivalent Production, Preparation of Process Accounts, Concepts of Joint Products and By Products. Service Costing: Meaning and Definition, Application of Service Costing, Determination of Service Cost in Transport Industry.	(15)
B) Practical	a) Visit any processing unit and prepare Process Accounts b) Visit any service organization and determine service cost.	
Module IV	Reconciliation of Cost and Financial Accounts: Need for Reconciliation of Cost and Financial Accounts.	(15)

A) Theory	Preparation of Statement of Reconciliation of Cost and Financial Accounts.	
B) Practical	Practical- Collect cost data and financial data from any organization and prepare Statement of Reconciliation of Cost and Financial Accounts.	

Learning Resources:

1. Cost accounting - B.K.Bhar
2. Cost accounting - Jain and Narang
3. Cost accounting - S N Maheshwari
4. Cost accounting (Problems & Solutions) - Khanna, Pandey, Arora & Ahuja
5. Cost accounting - Shukla, Grewal & Gupta

Nature of Question Paper

1. Q. No. 1 and 2 are compulsory
2. Attempt any three questions from Q. No. 3 to 6
3. Figures to the right indicate full marks.

Question		Marks
Que.1	Multiple Choice Questions	08
	Fill in the Blanks	04
	True or falls	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Problem	16
Que.4	Problem	16
Que.5	Problem	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - III
Advanced Costing Paper-V (Cost Accounting Record and Cost Audit)
CBP-1220-C)

Theory: 80 Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able to-

CO1: Understand the concept and applications of Cost Accounting Standards

CO2: Know various cost ledgers and statements

CO3: Know the integrated and non-integrated accounts

CO4: Uunderstand the reporting requirements under Cost Audit

Module	Title	Tech. Hrs.
Module I A) Theory	Introduction to Cost Accounting Standards: Preface to Cost Accounting Standards; Objectives and Functions of Accounting Standards Board; List of Cost Accounting Standards (CAS 1 to CAS 24), Scope of Cost Accounting Standards.	(15)
B) Practical	Practical: Paper Presentation on Objectives/Scope of Cost Accounting Standards.	
Module II A) Theory	Cost Ledgers and Statements: Cost Accounting Records, Cost Ledgers, Cost Statement, Concept of Cost Accumulation, Accountant's Role, Cost Data Collection	(15)
B) Practical	Practical: Visit any business unit and understand the cost ledgers and statements.	
Module III A) Theory	Non-Integrated and Integrated Accounts: Non-Integrated Accounts-Concept, Ledgers to be Maintained, Meaning of Control Accounts, Principal Accounts to be Maintained; Integrated Accounts-Concept, Features, Advantages and Disadvantages, Pre-requisites of Integrated Accounting System, Accounting Entries.	(15)
B) Practical	Practical: Paper Presentation on Integrated and Non-Integrated	

	Accounts.	
Module IV	Cost Audit:	
A) Theory	Concept of Cost Audit, Applicability and Legal Requirement of Cost Audit as per Companies Act, 2013, Specifications of Cost Audit Report, Provisions of Companies Act relating to Cost Audit, Qualification and Disqualification of Cost Auditor, Introduction to Companies (Cost Records and Audit) Rules, 2014, Management Reporting under Cost Audit.	(15)
B) Practical	Practical: Study cost audit report of any organization and the reporting requirements.	

Reference Books:

1. Cost Accounting: Principles and Practice: M. N. Arora, Vikas Publishing
2. Financial Management: Horngreen, Datar and Rajan, Pearson Education Publishers
3. Cost Accounting- Text, Problems and Solutions: Shukla, Grewal and Gupta, S.Chand
4. Cost Accounting: Principles and Practice: Jain and Narang, Kalyani Publishers
5. Cost and Management Accounting – Fundamentals and its Applications: Suveera Gill, VikasPublishing
6. Elements of Cost Accounting: S N Maheshwari, S N Mittal, Shree Mahaveer Book Depot
7. Advanced Management Accounting: Jawahar Lal, S.Chand Publications, 4th Edition
8. Cost Accounting: Jawahar Lal, Tata McGraw Hill
9. Advanced Cost and Management Accounting: Saxena and Vasishth, S.Chand and Sons
10. Cost Management: Ravi M Kishore, Taxmann Publications
11. Cost Accounting: Study Materila of the Institute of Cost and Management Accountants of India (FinalCourse)
12. Cost Management: Study Material of The Institute of Chartered Accountants of India (Final Course)

Nature of Question Paper

Instructions:

1. Q. No. 1 and 2 are compulsory
2. Attempt any three questions from Q. No. 3 to 6
3. Figures to the right indicate full marks.

Question		Marks
Que.1	Multiple Choice Questions	08
	Fill in the Blanks	04
	True or falls	04

Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Problem	16
Que.4	Problem	16
Que.5	Problem	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - III Paper- I
Business Administration Paper-V(Corporate Governance and Business Ethics) CBP-1221-C
Theory: 80Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able to-

CO1: Understand the concept of corporate governance and its importance.

CO2: Know the role of corporate governance and directors.

CO3: Know the role of shareholders, auditor and corporate governance

CO4: Understand the business ethics and international business

Module	Title	Tech. Hrs.
Module I A) Theory	Introduction To Corporate Governance: a) Corporate Scandals: Enron Scandal, Lehman Brothers Scandal, Harshad Mehta Scam, Satyam Computers Scandals, Punjab National Bank Scam. b) Effects of Corporate Scandals: Effects of Scandals / Scams on Economy, Society and Shareholders, Potential Consequences of Poor Corporate Governance. c) Corporate Governance: Meaning & Definitions, OECD Principles of Corporate Governance, Scope of Corporate Governance, Importance of Corporate Governance. d) Models of Corporate Governance: Anglo-American Model, The German Model, The Japanese Model & Indian Model.	(15)
B) Practical	1. Collect information on corporate scams/scandals and prepare a report on the amount involved in it and the nature of fraud or unethical behaviour. 2. Choose any two companies and compare and contrast their corporate governance practices.	
Module II A) Theory	Directors and Corporate Governance: a) Landmarks In Emergence of Corporate Governance: Cadbury committee, Higgs committee, Kumarmangalam Birla committee, Naresh Chandra Committee, the CII code. b) The Directors: meaning of directors, types of directors, statutory and general duties of directors. c) The Board of Directors: structure and composition of board, unitary and two-tier boards, composition and functions of nomination committee, remuneration committee. d) Governance Responsibilities: role of board of directors in corporate governance, roles of chairman and CEO.	(15)
B) Practical	1. Scrutinize the annual reports of any two companies and prepare a report on composition of their board of directors and types of	

	<p>directors.</p> <p>2. Prepare a report on the decisions taken by nomination committee & remuneration committee of companies.</p>	
<p>Module III</p> <p>A) Theory</p>	<p>Shareholders, Auditors & Corporate Governance:</p> <p>1. Shareholders: Meaning & Types of Shareholders, Rights & Duties of Equity Shareholders, Protection to Minority Shareholders.</p> <p>2. Responsibilities of Shareholders: Role of Shareholders in Corporate Governance, Shareholders Activism and Its Effects on Corporate Governance.</p> <p>3. Auditors: Meaning of Auditors, Auditors Role in Corporate Governance.</p> <p>4. Audit Committee: Meaning & Constitution, SEBI Guidelines in Regard To Audit Committee, Role and Functions of The Audit Committee, Views of Blue Ribbon Committee Regarding Audit Committee, Audit Failure.</p>	(15)
B) Practical	<p>1. Analyze the annual reports of companies and prepare a report on their shareholding patterns, &</p> <p>2. Analyze the auditor's report contained in the annual report of the company.</p>	
<p>Module IV</p> <p>A) Theory</p>	<p>Business Ethics In International Business:</p> <p>1. Business Ethics: Concept & Definitions, Sources of Ethics, Ethics And Human Rights, Importance of Doing Business on Merit</p> <p>2. Ethical Principles in Business: Ethical Principles in Business From Indian Perspective, Corporate Citizenship, Factors Affecting Ethical Decision Making.</p> <p>3. Ethics in International Business: Home and Host Country's Regulations and Compulsions of International Agencies, The Us Sarbanes-Oxley Act, 2002.</p> <p>4. Wider concept of social responsibility: balance between profit and social/ moral obligations and survival, judicious use of natural resources, Kyoto Protocol concern of global warning.</p>	(15)
B) Practical	<p>1. Collect the annual reports of public limited companies and list out the corporate social responsibilities discharged by them.</p> <p>2. Enlist the initiatives taken to encounter the problem of global warning.</p>	

Reference Books:

1. C.V. Baxi, 'Corporate Governance' - Excel Books, New Delhi.
2. Geeta Rai & R. K. Mishra, 'Corporate Governance: Theory and Practice' - Excel Books, New Delhi.
3. Dr. S. Singh, 'Corporate Governance: Global Concepts and Practices' - Excel Books, New Delhi.
4. Mallin, Christine A., 'Corporate Governance', Oxford University Press
5. Parthasarthy, 'Corporate Governance: Principles, Mechanism and Practices', Biztantra Publishers, New Delhi.
6. A. C. Fernando, 'Corporate Governance- Policies, Principles and Practices', Pearson Publications, New Delhi.
7. Balsubramanian, 'Corporate Governance'

8. Chakraborty, 'Values and Ethics For Organizations' - Oxford University Press
9. Hartman, Chatterji, 'Perspectives In Business Ethics' - Oxford University Press
10. Crane & Matten, 'Business Ethics' - Oxford University Press
11. Mitra, 'Its Only Business' - Oxford University Press
12. Fraedrich, Ferrel, 'Business Ethics'
13. Bajaj & Agarwal 'Business Ethics'. Biztantra Publishers, New Delhi.
14. N. K. Uberoi, 'Environment Management' - Excel Books, New Delhi. Relevant Websites May Also Be Referred.

Nature of Question Paper

Marks: 80

Duration: 3 hours.

Instructions:

1. Q. No. 1 and 2 are compulsory
2. Attempt any three questions from Q. No. 3 to 6
3. Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	08
	Fill in the Blanks	04
	True or falls	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Long answer	16
Que.4	Long answer	16
Que.5	Long answer	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - III
Advanced Accountancy Paper- VI (Research Methodology) (CBP-1222C)
Theory: 80 Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able to-

CO1: Identify the research problem and formulate objectives.

CO2: Choose appropriate methodology with proper ols and techniques.

CO3: Analyze and interpret the data collected from different sources.

CO4: Make decision or find out conclusions on the basis of data analysis

Course title	Advanced Costing- VI (Research Project)
	<ol style="list-style-type: none"> 1. Project report can be prepared on any subject or compulsory or respective optional subject incorporated in the M.com Program based. 2. Panel of viva-voce examination will be of three experts (one expert is internal and two are external chairman will be external experts and have to submit final marks. 3. Viva -voce will be conducted at the end of academic year but before the commencement of theory examination. It will be conducted by the internal & external examiners appointed by the college. 4. 100 Marks of project work will be given collectively by the internal & external examiners and the average of these marks will be taken as final marks by external examiners after via-voce submitted to college. 5. Project work will be done by the students individually 6. The project work will be consisting at least typed 50 pages. 7. Two copies of typed project reports should be submitted to the college 8. Students are required to prepare the project report based on the field workor Secondary data and studying the current trends in commerce and management under the guidance of the project guide. Project report can be prepared by using primary and secondary data.

M. Com. Part - I CBCS
Semester - III
Advanced Costing Paper- VI (Research Methodology) (CBP-1223C)
Theory: 80Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able to-

CO1: Identify the research problem and formulate objectives.

CO2: Choose appropriate methodology with proper ols and techniques.

CO3: Analyze and interpret the data collected from different sources.

CO4: Make decision or find out conclusions on the basis of data analysis

Course title	Advanced Costing- VI (Research Project)
	<ol style="list-style-type: none"> 1. Project report can be prepared on any subject or compulsory or respective optional subject incorporated in the M.com Program based. 2. Panel of viva-voce examination will be of three experts (one expert is internal and two are external chairman will be external experts and have to submit final marks. 3. Viva -voce will be conducted at the end of academic year but before the commencement of theory examination. It will be conducted by the internal & external examiners appointed by the college. 4. 100 Marks of project work will be given collectively by the internal & external examiners and the average of these marks will be taken as final marks by external examiners after via-voce submitted to college. 5. Project work will be done by the students individually 6. The project work will be consisting at least typed 50 pages. 7. Two copies of typed project reports should be submitted to the college 8. Students are required to prepare the project report based on the field workor Secondary data and studying the current trends in commerce and management under the guidance of the project guide. Project report can be prepared by using primary and secondary data.

M. Com. Part - I CBCS
Semester - III
Business Administration Paper- VI (Research Methodology) (CBP-1224C)
Theory: 80Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able to-

CO1: Identify the research problem and formulate objectives.

CO2: Choose appropriate methodology with proper ols and techniques.

CO3: Analyze and interpret the data collected from different sources.

CO4: Make decision or find out conclusions on the basis of data analysis

Course title	Advanced Costing- VI (Research Project)
	<ol style="list-style-type: none"> 1. Project report can be prepared on any subject or compulsory or respective optional subject incorporated in the M.com Program based. 2. Panel of viva-voce examination will be of three experts (one expert is internal and two are external chairman will be external experts and have to submit final marks. 3. Viva -voce will be conducted at the end of academic year but before the commencement of theory examination. It will be conducted by the internal & external examiners appointed by the college. 4. 100 Marks of project work will be given collectively by the internal & external examiners and the average of these marks will be taken as final marks by external examiners after via-voce submitted to college. 5. Project work will be done by the students individually 6. The project work will be consisting at least typed 50 pages. 7. Two copies of typed project reports should be submitted to the college 8. Students are required to prepare the project report based on the field workor Secondary data and studying the current trends in commerce and management under the guidance of the project guide. Project report can be prepared by using primary and secondary data.

M. Com. Part - I CBCS
Semester - IV
Business Finance Paper-II (CBP-1225 D)
Theory: 80 Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able to

CO1: Understand the capital market.

CO2: Know the concept and application of Mutual Funds, Portfolio Management and Micro Finance and Credit Rating in their life and organisation

CO3: Identify causes and remedies of corporate failure and understand the concept of corporate restructuring.

CO4: Take business decisions like make or buy shutdown or continue

Module	Title	Teaching hours
Module I A) Theory	Capital Markets: (a) Primary Capital Market: Meaning, role and functions, Methods of selling corporate securities in primary capital market. Underwriting of Securities. (b) Secondary Capital Market (Stock Exchange): Meaning, evolution of stock market in India, Role and functions of stock exchange. Trading mechanism in stock market. (c) SEBI and Credit Rating: Role of SEBI in regulating capital markets in India. Credit Rating: Meaning, need, credit rating agencies in India, Credit rating methodology. (d) Depository: Meaning, role, benefits and present position in India. National Securities Depository Limited (NSDL) and Central Depository Services India Limited (CDSL)	(15)
B) Practical	a) Visit to any share broker office and observe share trading activities.	
Module II A) Theory	Mutual Funds, Portfolio Management and Micro Finance: (a) Mutual Funds: Concept, importance, Types of Mutual Funds- - Money Market Funds, Income Funds, Bond Funds, Balanced Funds, Equity Funds, International Funds, Specialty Funds, Index Funds, Exchange-Traded Funds Present position of Mutual Funds in India. (b) Portfolio Management: Meaning, importance, objectives. Various issues in portfolio construction, revision and evaluation. (c) Financial Inclusion: Meaning, need and government policy. (d) Micro-Finance: Concept, characteristics, need, present position in India.	(15)
B) Practical	a) Make small research in latest top 10 Performing Mutual	

	Funds.	
Module III A) Theory	Corporate Restructuring : (a) Corporate Failure: Meaning causes and remedies. (b) Corporate Restructuring: Meaning, forms- Mergers and Amalgamation, Acquisitions / Take-over, Demergers, divesture, Buy outs, Financial Restructuring, and Strategic Alliances-meaning, benefits and legal procedure.	(15)
B) Practical	a) Prepare & presentation on latest 5 cases of corporate restructure.	
Module IV A) Theory	Financial Decision making: (a) Project Feasibility or Viability Analysis: Concept - Free Cash Flow, Net Present Value (NPV) and Methods, Profitability Index, Pay Back Period. (b) Make or Buy Decision: Meaning, Methodology. (c) Profit maximization through optimum product mix	(15)
B) Practical	a) Prepare hypothetical case study of a project and analyses by different methods of project selection.	

Reference Books:

1. Financial Management-Rajiv Shrivastava and Anil Misra, Oxford University Press, New Delhi
2. Financial Management- Dr. Anil Kumar Dhagat, Kognet Learning Solutions Inc., Dreamtech Press, New Delhi
3. Finance Sense ---Finance for Non-finance Executives, Prasanna Chandra, Tata McGraw Hill Education Pvt. Ltd., New Delhi
4. Investment and Securities Market in India- V.A.Avdhani
5. Security Analysis and Portfolio Management- Sasidharan/ Mathews
6. Security Analysis and Portfolio Management- PunithavathyPandian
7. Portfolio Management Handbook- Robert A. Strong
8. Stock Exchange and Investment- Raghunathan
9. Stock Exchange Trading in India- Gupta L.C.
10. Capital Issues, SEBI and Listing- Chandratre K.R
11. Corporate Mergers, Amalgamations & Take Over- Verma J.C.
12. Corporate Restructuring and Indian Perspective- Mattoo P.K
13. International Business-Aswthappa, TMH, N. Delhi

Nature of Question Paper
Business Finance Paper- II

Marks: 80

Duration: 3 hours.

Instructions:

- 4) Q. No. 1 and 2 are compulsory
- 5) Attempt any three questions from Q. No. 3 to 6
- 6) Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	08
	Fill in the Blanks	04
	State 'True' or 'False'	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Long answer	16
Que.4	Long answer	16
Que.5	Long answer	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - IV
Management Accounting- II (CBP-1226 D)
Theory: 80 Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able to

CO1: Understand the fundamentals of Management Control System and Reporting.

CO2: Explain the marginal costing and cost-volume-profit analysis and practical decision making based thereon.

CO3: Simulate the budgetary control system and demonstrate the budgeting.

CO4: Practice to analyze the cost variances

Module	Title	Tech. Hrs.
Module I	Management Control System:	
A) Theory	a) Meaning, Need, Importance and Scope of Management Control System, Management Control Process; b) Strategic Planning-Meaning, Difference between Strategic Planning and Management Control and c) Reporting to Management- Types of Reports and Characteristics of good report.	(15)
B) Practical	Practical- Group discussion can be conducted in the classroom on the contents of Module-I	
Module II	Marginal Costing and CVP Analysis:	
A) Theory	Meaning and Application of Marginal Costing, Break-Even Analysis, Cost-Volume- Profit (CVP) Analysis, Decision Making through Marginal Costing- Make or Buy Decision, Shut Down or Continue Decision, CVP Analysis in Multi-product Decision, Alternative Course of Action.	(15)
B) Practical	Practical- a) Exercise for Simulation of computing break-even point and margin of safety and interpret the situations. Draw break-even charts on graph paper considering hypothetical data and compare output of graphical method with algebraic method.	
Module III	Budgetary Control:	
A) Theory	Meaning of Budget and Budgetary Control, Objectives, Advantages and Limitations; Types of Budgets - Production, Sales, Cash, Master Budget,	(15)

	Fixed and Flexible Budget; Capital Expenditure Budgeting (Note: Problems will be asked on Cash Budget, Flexible Budget and Capital Budget only)	
B) Practical	Practical: Role Play can be arranged to know the working of budget committee works in budgetary control system or Visit any organization which has well established budgetary control system and discuss with budget officer regarding it.	
Module IV A) Theory	Standard Costing and Variance Analysis: a) Meaning of Standard Cost and Standard Costing, Setting a System of Standard Costing, Advantages and Limitations; b) Variance Analysis- Material Cost Variances, Labour Cost Variances and Overhead Variances	(15)
B) Practical	Practical: a) Compute variances on the basis of hypothetical data and interpret it. b) Analyze variances for such any organization which has well established budgetary control system and discuss with budget officer regarding it.	

Reference Books:

1. Khan M.Y. and Jain P.K. Management accounting, Tata McGraw Hill, New Delhi
2. Charles T. Horngren, Introduction to management Accounting, Prentice Hall of India, New Delhi.
3. Horngren, Charles T. George Foster and Shrikant M. Daliar : Cost
4. Accounting : A Managerial Emphasis, Prentice Hall, Delhi
5. Pandey I. M. Management Accounting, Vani Publication, Delhi. '
6. Welsch Glenn A., Ronald W. Hilton and Paul N. Gordon : Budgeting,
7. Profit Planning and control, Prentice Hall, New Delhi.
8. Manmohan & Goyal : Principles of Management Accounting
9. Maheshwari: Principles of Management Accounting
10. Robert Anthony and Vijay Govindrajana - Management Control System.

Nature of Question Paper

Marks: 80

Duration: 3 hours.

Instructions:

1. Q. No. 1 and 2 are compulsory
2. Attempt any three questions from Q. No. 3 to 6
3. Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	10
	Fill in the Blanks	06
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Problem	16
Que.4	Problem	16
Que.5	Problem	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - IV
Advanced Accountancy Paper-VII (Financial Management) (CBP-1227 D)
Theory: 80 Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able-

CO1: Understand the concept of Financial Management and Role of Finance Manager.

CO2: Know the Concept of Capital Structure.

CO3: Understand the concept of Cost of Capital

CO4: Understand the Corporate restructuring and significance of PE ratio and EPS analysis.

Module	Title	Tech. Hrs.
Module I	Introduction to Financial Management: Introduction - Meaning and Scope- Finance Functions, Objectives of Financial Management. Role of Finance Manager.	(15)
A) Theory		
B) Practical	1. Visit any organisation and know the role of finance manager.	
Module II	Capital Structure Decisions: Net Income Approach, Net Operating Income Approach, Traditional Approach and Modigliani-Miller Approach. Leverages- Financial, Operating and Combined. EBIT-EPS Analysis.	(15)
A) Theory		
B) Practical	Download the financial statements of any company & study the capital structure	
Module III	Cost of Capital: Cost of Debt, cost of Preference Shares, Cost of Equity, Cost of Retained Earnings. Weighted Average Cost	(15)
A) Theory		
B) Practical	Practical: Download the financial statements of any two companies & make a comparative study.	
Module IV	Corporate Restructuring: Merger and Acquisition - Motives and Benefits, Merger Negotiations - Significance of P/E Ratio and EPS Analysis.	(15)
A) Theory		
B) Practical	Practical: Study the recent mergers & Prepare a report	

Reference Books

1. Introduction to Financial Management - I M Pandey
2. Financial Management - Prasanna Chandra
3. Financial Management - Khan and Jain
4. Financial management - Ravi M Kirhare
5. Cost Accounting and Financial management - Tulsian

6. Financial Management - P V Kulkarni

7. Financial Management - S C Saxena

8. Financial Management - Hogland.

Nature of Question Paper

Advanced Accountancy Paper-VII (Financial Management)

Marks: 80

Duration: 3 hours.

Instructions:

1. Q. No. 1 and 2 are compulsory
2. Attempt any three questions from Q. No. 3 to 6
3. Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	08
	Fill in the Blanks	04
	True or falls	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Problem	16
Que.4	Problem	16
Que.5	Problem	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - IV
Advanced Costing Paper-VII (Cost Analysis and Decision Making)
(CBP-1228 D)
Theory: 80 Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able to-

CO1: Understand the use of cost in different areas of decision making.

CO2: Analyze the use of cost in pricing decisions.

CO3: Understand the concept of transfer pricing and its applications.

CO4: Demonstrate the application of relevant information in decision making.

Module	Title	Tech. Hrs.
Module I A) Theory	Areas of Decisions Making: Pricing of Product, Inventory Control, Location of Plant, Own or Lease, Sale or Scrap, Retain or Replace, Repair or Renovate, Sale of Further Process, Change V/s Status Quo; Product Decisions- Product Development Decision, Product Policy and Product Distribution Decision; Marketing Decisions.	(15)
B) Practical	Practical: Visit any business unit and understand the process of decision making in respect of any one decision area mentioned above.	
Module II A) Theory	Pricing Decisions: Pricing of Finished Product-Cost Plus Pricing, Rate of Return Pricing, Variable Cost Pricing, Competitive Pricing, Incremental Pricing; Theory of Price, Pricing Policy, Principles of Product Pricing, Pricing Strategies-Market Entry Strategies, Price Discounts and Differentials, Price Discrimination and Geographic Pricing Strategies; Pareto Analysis- Usefulness and Application of Pareto Analysis.	(15)
B) Practical	Practical: Study the pricing policy of finished product in any business unit and prepare the report.	
Module III A) Theory	Relevant Information and Decision Making: Meaning and Nature of Activity Based Costing, Concept of Cost Drivers, Preparation of Cost Statement, Income Statement on the basis of Activity Based Costing as well as Absorption Costing	(15)

B) Practical	Practical: Analyze the use of relevant information by visiting any local firm and elaborate its use in pricing.	
Module IV A) Theory	Transfer Pricing: Concept of Transfer Pricing, Objectives and Requisites of a Sound Transfer Pricing System, Methods of Transfer Pricing- Market Based, Cost Based, Negotiated Transfer Pricing, Dual Prices, Setting Transfer Prices in Different Situations, Disadvantages of Transfer Pricing, Divisional Performance Measurement.	(15)
B) Practical	Practical: Presentation on transfer pricing and divisional performance measurement.	

Reference Books

1. Cost Accounting: Principles and Practice: M. N. Arora, Vikas Publishing
2. Financial Management: Horngreen, Datar and Rajan, Pearson Education Publishers
3. Cost Accounting- Text, Problems and Solutions: Shukla, Grewal and Gupta, S.Chand
4. Cost Accounting: Principles and Practice: Jain and Narang, Kalyani Publishers
5. Cost and Management Accounting - Fundamentals and its Applications: Suveera Gill, Vikas Publishing
6. Elements of Cost Accounting: S N Maheshwari, S N Mittal, Shree Mahaveer Book Depot
7. Advanced Management Accounting: Jawahar Lal, S.Chand Publications, 4th Edition
8. Cost Accounting: Jawahar Lal, Tata McGraw Hill
9. Advanced Cost and Management Accounting: Saxena and Vasishth, S.Chand and Sons
10. Cost Management: Ravi M Kishore, Taxmann Publications
11. Cost Accounting: Study Materila of the Institute of Cost and Management Accountants of India(Final Course)
12. Cost Management: Study Material of The Institute of Chartered Accountants of India (Final Course)

Nature of Question Paper
Advanced Costing Paper-VII (Cost Analysis and Decision Making)

Marks: 80

Duration: 3 hours.

Instructions:

1. Q. No. 1 and 2 are compulsory
2. Attempt any three questions from Q. No. 3 to 6
3. Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	08
	Fill in the Blanks	04
	True or falls	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Practical Problem/ Long answer question	16
Que.4	Practical Problem/ Long answer question	16
Que.5	Practical Problem/ Long answer question	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - IV
Business Administration Paper-VII (Functional Areas of Management:
Recent Trends (CBP-1229 D)
Theory: 80Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able to-

CO1: Be aware regarding the recent trends in functional areas of management.

CO2: Acquaint with the best global practices of HR, Finance, Marketing and Operations.

CO3: Explore the roles of quality Global Manager.

CO4: Demonstrate the application of relevant information in decision making.

Module	Title	Tech. Hrs.
Module I A) Theory	Recent trends in HR: Employee Engagement, Employer Branding, Green HRM, Talent Management, HR Capital, Human Resource Accounting and Auditing, HR Matrices.	(15)
B) Practical	1. Read and understand the balance sheet of any company prepared in accordance with human resource accounting. 2. Write an assignment on talent management and HR metrics	
Module II A) Theory	Recent trends in marketing: Digital Marketing, - Use of Social Media in Marketing, Cause Related Marketing, Viral Marketing- E Mail Marketing Mobile Marketing, Blogging, Video Marketing, Neuro Marketing, Green Marketing, Social Appvertising.	(15)
B) Practical	1. Write an assignment on green marketing / cause related marketing. 2. Go through the advertisement campaigns of companies run through social media and analyze its impact.	
Module III A) Theory	Recent trends in finance: Introduction To IFRS, Forensic Accounting/Activity Based Costing, Balanced Scorecard, Budgeting and Performance Evaluation (Financial and Non-Financial Measures), Value Chain Analysis, Benchmarking.	(15)
B) Practical	1. Analyze the annual reports of MNCs prepared in	

	accordance with IFRS. 2. Prepare a presentation on budgeting / forensic accounting / benchmarking.	
Module IV A) Theory	Recent trends in operations and quality management: Concept of Quality, Quality Philosophy, Quality Assurance, Quality Control, Inspection, Cost of Quality, Quality Circles, Total Quality Management, ISO Certification.	(15)
B) Practical	1. Enlist the properties for ISO certification OR 2. Write a case study on total quality management	

Learning Resources:

1	Reference Books	<ol style="list-style-type: none"> 1. Chunawalla S. A. and Patel D. R. - Production and Operations Management, Himalaya Publishing House, Mumbai. 2. Paneerselvam R. - quality management, production and operations management,, Himalaya Publishing House, Mumbai. 3. C.A. Kamal Garg - Ind AS and IFRS 4. Advanced accounting - the institute of chartered accountants of INDIA, New Delhi 5. Arora M. N. - cost accounting, vikas publishing, new delhi 6. Ravi m Kishore - cost management, taxmann publications, new delhi. 7. Gary dessler - human resource management. 8. P. subbarao- personnel and human resource management 9. K. aswathappa- human resource management- text and cases 10. V.s.p. rao- human resource management- text and cases
---	------------------------	--

Nature of Question Paper

Business Administration Paper-VII (Functional Areas of Management: Recent Trends)

Marks: 80

Duration: 3 hours.

Instructions:

1. Q. No. 1 and 2 are compulsory
2. Attempt any three questions from Q. No. 3 to 6
3. Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	08
	Fill in the Blanks	04
	True or falls	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Practical Problem/ Long answer question	16
Que.4	Practical Problem/ Long answer question	16
Que.5	Practical Problem/ Long answer question	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - IV
Advanced Accountancy Paper-VIII (Taxation) CBP-1230-D
Theory: 80 Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able-

CO1: Know the basic concept related income tax.

CO2: Understand the process of computing taxable income.

CO3: Practice with e-filing of income tax return and online payment.

CO4: Gain knowledge about GST

Module	Title	Tech. Hrs.
Module I A) Theory	Definitions, Exemptions & Deductions: Definitions under the Income Tax Act,1961, Exemptions under section-10, Deductions from Gross Total Income under chapter-VI A.	(15)
B) Practical	Group discussion can be conducted in the classroom on the contents of module-I	
Module II A) Theory	Taxable Income and Tax Liability: Computation of Taxable Income and Tax Liability of Individual, H.U.F., Firm, Association of Persons and Limited Company.	(15)
B) Practical	Collect data from any individual or any other assessee and compute taxable income and tax liability.	
Module III A) Theory	Clubbing of Income and Online Tax Governance: Clubbing of Income, Set-off and Carry Forward of Losses, E Filing of Returns, Online Payment of Tax.	(15)
B) Practical	Make e-filing of IT return of any individual.	
Module IV A) Theory	Introduction to GST: Introduction to Goods and Service Tax (GST), Concept of GST, Nature and basis of charge, Registration under GST, Valuation of taxable services, Provisions pertaining to returns under GST.	(15)
B) Practical	Group discussion on any point given in module-IV.	

Reference Books

1. Singhania – Student’s Guide to Income Tax
2. Prasad Bhagwati – Income Tax Law & Practice
3. Mehrotra H.C. – Income Tax Law
4. Dinkar Pagare – Income Tax Law and Practice
5. Ahuja and Gupta – Systematic Approach to Income Tax

Nature of Question Paper Advanced Accountancy Paper-VIII (Taxation)

Marks: 80

Duration: 3 hours.

Instructions:

1. Q. No. 1 and 2 are compulsory
2. Attempt any three questions from Q. No. 3 to 6
3. Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	08
	Fill in the blanks	04
	True or falls	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Problem	16
Que.4	Problem	16
Que.5	Problem	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

**M. Com. Part - I CBCS
Semester - IV**

**Advanced Costing Paper-VIII (Contemporary Issues in Cost Accounting) CBP-1231-D
Theory: 80 Teaching Hours Credits - 4**

Course Outcome: After successful completion of this course, the students will be able-

CO1: Understand the concept of Cost Management.

CO2: Know the concepts of Balanced Scorecard, JIT, MRP, ERP and Value Chain.

CO3: Know the concepts of Responsibility Accounting and Performance Evaluation.

CO4: Demonstrate the measures of Performance Evaluation for Strategic Management

Module	Title	Tech. Hrs.
Module I A) Theory	Strategic Cost Management: Concept of Cost Management; Target Costing- Definition, Principles, Benefits, Steps for Implementation and Problems in Implementation; Life Cycle Costing- Definition of Life Cycle and Life Cycle Costing, Rationale and Evaluation of Life Cycle Costing; Kaizen Costing- Definition, Benefits and Concerns, Comparison with Traditional Costing	(15)
B) Practical	Practical: Write and assignment on Target Costing or Life Cycle Costing or Kaizen Costing	
Module II A) Theory	Responsibility Accounting, Performance Evaluation: Concept of Responsibility Accounting, Types of Responsibility Centers, Performance Evaluation, Financial and Non-Financial Measures of Performance Measurement	(15)
B) Practical	Practical: Write a Case Study on Performance Evaluation or Transfer Pricing.	
Module III A) Theory	Balanced Scorecard: Concept of Balanced Scorecard, Four Perspectives of BSC (Financial, Customer, Internal Business Process, Learning and Growth), Characteristics, Benefits and Challenges of the Balanced Scorecard, BSC as a tool for Strategic Management.	(15)
B) Practical	Practical: Analyze the four perspectives of Balanced Scorecard for any commercial organization to understand the concept.	
Module IV A) Theory	JIT, MRP, ERP and Value Chain Analysis: Concept of Just in Time System, Impact and Performance Measurement in JIT, Back flushing in JIT, Concept of Material Requirement Planning, Purpose and Data Requirement of MRP, Concept of Enterprise Resource Planning, Features, Benefits of ERP, Prerequisites of	(15)

	ERP, Concept of Value Chain Analysis, Competitive Advantage and Customer Value, Strategic Framework for Value Chain Analysis	
B) Practical	Practical: Presentation on JIT/MRP/ERP/Value Chain Analysis.	

ReferenceBooks

1. Cost Accounting: Principles and Practice: M. N. Arora, Vikas Publishing
2. Financial Management: Horngreen, Datar and Rajan, Pearson Education Publishers
3. Cost Accounting- Text, Problems and Solutions: Shukla, Grewal and Gupta, S.Chand
4. Cost Accounting: Principles and Practice: Jain and Narang, Kalyani Publishers
5. Cost and Management Accounting – Fundamentals and its Applications: Suveera Gill, VikasPublishing
6. Elements of Cost Accounting: S N Maheshwari, S N Mittal, Shree Mahaveer Book Depot
7. Advanced Management Accounting: Jawahar Lal, S.Chand Publications, 4th Edition
8. Cost Accounting: Jawahar Lal, Tata McGraw Hill
9. Advanced Cost and Management Accounting: Saxena and Vasishth, S.Chand and Sons
10. Cost Management: Ravi M Kishore, Taxmann Publications
11. Cost Accounting: Study Materila of the Institute of Cost and Management Accountants of India (FinalCourse)
12. Cost Management: Study Material of The Institute of Chartered Accountants of India (Final Course)

Nature of Question Paper

Advanced Costing Paper-VIII (Contemporary Issues in Cost Accounting)

Marks: 80

Duration: 3 hours.

Instructions:

1. Q. No. 1 and 2 are compulsory
2. Attempt any three questions from Q. No. 3 to 6
3. Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	08
	Fill in the blanks	04
	True or falls	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Practical Problem/ Long answer question	16
Que.4	Practical Problem/ Long answer question	16
Que.5	Practical Problem/ Long answer question	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

M. Com. Part - I CBCS
Semester - IV
Business Administration Paper-VIII (Strategic Management)
Theory: 80 Teaching Hours Credits - 4

Course Outcome: After successful completion of this course, the students will be able to-

CO1: Understand conceptual analytical framework of strategic management.

CO2: Know the strategic management process.

CO3: Search different strategies followed by corporate in the world.

CO4: Understand basic approaches in strategy formulation, implementation, evaluation and control.

Module	Title	Tech. Hrs.
Module I A) Theory	Definition and Nature of Corporate Planning: Planning, Advantages and Disadvantages, Concept and Definition of Strategy, Strategic Management, Strategic Management Process, Vision Mission, Goals and Objectives, Environment Scanning and Organizational Appraisal.	(15)
B) Practical	Select a business organization, analyze internal and external environment & present in the class.	
Module II A) Theory	Strategy Formulation- Corporate Level Strategies - Stability, Growth, Retrenchment & Combination Strategies. Business Level Strategies - Cost Leadership, Differentiation and Focus Strategies Strategic Choice - Process of Strategic Choice, Competitor Analysis, Porters Five Forces Model of Competition, Mckinsey's 7s Framework, GE -9 Cell Model, BCG Matrix.	(15)
B) Practical	Regularly read newspaper and study the recent strategies of the 5 corporates and submit a report.	
Module III A) Theory	Strategy Implementation: Interrelationship Between Formulation and Implementation, Resource Allocation, Behavioural - Implementation, Structural Implementation, Functional Implementation, Financial, Marketing, Operations and Personnel Plans and Policies.	(15)
B) Practical	Visit an industry nearby you and study their functional strategy.	
Module IV A) Theory	Strategy Evaluation and Control: Strategy Evaluation, Importance, Overview of Strategic Control, Operational Control, Techniques of Strategic Evaluation and Control.	(15)
B) Practical	In the same industry study their operation control techniques.	

Reference Books

1. Strategic Management & Business Policy- KazmiAzhar - Tata McGraw Hill
2. Crafting and Executing Strategy: The Quest For Competitive Advantage, Thompson, Strickland. Gamble Jain, McGraw Hill Publications.
3. Strategic Management- HittIreland, Hoskisson, Manikutty, Cenage Learning IndiaPvt. Ltd.
4. Strategic Management: Concepts & Cases- UpendraKachru, Excel Books.
5. Strategic Planning: Formulation of Corporate Strategy-V. S. Ramaswamy, S.Macmillan Publishing House Ltd.
6. Business Policy and Strategic Management- P. Subbarao, Himalaya Publications.
7. Strategic Management of E-Business - Stephan Chen, Wiley.

Nature of Question Paper

Business Administration Paper-VIII (Strategic Management)

Marks: 80

Duration: 3 hours.

Instructions:

1. Q. No. 1 and 2 are compulsory
2. Attempt any three questions from Q. No. 3 to 6
3. Figures to the right indicate full marks.

Question	Nature of Question	Marks
Que.1	Multiple Choice Questions	08
	Fill in the blanks	04
	True or falls	04
Que.2	Short Answers. (Any Two out of Three)	16
Que.3	Practical Problem/ Long answer question	16
Que.4	Practical Problem/ Long answer question	16
Que.5	Practical Problem/ Long answer question	16
Que.6	Short Notes (Any Two out of Three)	16

Internal Exam:

Sr. No	Nature	Marks
1.	Home assignment	10 Marks
2.	Seminar by using PPT	10 Marks
Total Marks for Internal =		20 Marks

Dissemination of Education for Knowledge, Science and Culture"

- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)**



DEPARTMENT OF CHEMISTRY

**M. Sc. Part - II Organic Chemistry
Semester-III & IV**

SYLLABUS

Under Choice Based Credit System

to be implemented from Academic Year 2019-20

Vivekanand College, Kolhapur (Autonomous)
Department of Chemistry
M. Sc. Part-II, (Sem III and IV)
Organic Chemistry Syllabus (CBCS) 2019 - 20

Total No. of Semester - 02

Total No. of Papers - 08

No. of papers (theory) per semester - 04

No. of practical course per semester - 02

Maximum marks per paper (practical) -100

Distribution of Marks - Internal evaluation - 20

External evaluation - 80

(Semester exam.)

Total Marks for M. Sc. Degree

Theory Paper: 1600

Practical course: 800

Total: 2400

Course Structure

Sr. No.	Paper No.	Course code	Course Name	Teaching Scheme		Examination Scheme and Marks				Course Credits
				Hours/week		ESE	CI E	PR	Marks	
				TH	PR					
Semester-III										
COMPULSORY COURSE										
1	IX	CC - 1143C	Organic Reaction Mechanism	4	-	80	20	-	100	4
2	X	CC - 1144C	Advanced Spectroscopic methods	4	-	80	20	-	100	4
3	XI	CC - 1145C	Advanced Synthetic methods	4	-	80	20	-	100	4
4	XII	CC - 1146C	Drugs and Heterocycles	4	-	80	20	-	100	4

6		CC - 1147C	Practical Course: V	4	-	-	-	100	100	4
7		CC - 1148C	Practical Course: VI	4	-	-	-	100	100	4
				16	08	320	80	200	600	24
Semester-IV										
COMPULSORY COURSE										
1	XIII	CC - 1149D	Theoretical Organic Chemistry	4	-	80	20	-	100	4
2	XIV	CC - 1150D	Stereochemistry	4	-	80	20	-	100	4
3	XV	CC - 1151D	Chemistry of Natural Products	4	-	80	20	-	100	4
ELECTIVE PAPERS										
4	XVI(A)	CC - 1152D	Applied Organic Chemistry	4	-	80	20	-	100	4
5	XVI(B)	CC - 1153D	Bioorganic Chemistry	4	-	80	20	-	100	4
6		CC - 1154D	Practical Course: VII	4	-	-	-	100	100	4
7		CC - 1155D	Practical Course: VIII	4	-	-	-	100	100	4
				16	08	320	80	200	600	24
Total (Sem. III & IV)				32	16	640	160	400	1200	48

Vivekanand College (Autonomous), Kolhapur

M. Sc. Part - II (Organic Chemistry)

CBCS Syllabus with effect from June - 2019

Semester - III

Paper No. - IX: Organic Reaction Mechanism (CC - 1143 C)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Adopt the knowledge about the path and to determine the rates of reactions by Kinetic and non kinetic methods - steps involved, reaction rate determination, order and molecularity, Testing and trapping of intermediates, stereochemistry and Hammett Taft equation.
- CO2:** Understand the concept of Pericyclic reactions, Woodward Hoffman correlation diagrams - FMO, PMO approach, conrotatory and disrotatory motion. Also identify the reactions as $4n$, $4n+2$ and $2+2$ addition of ketenes, sigmatropic shifts (3,3) and (5,5) Claisen and Cope and Aza Cope rearrangement.
- CO3:** Learn the mechanism and stereochemistry, migratory aptitude and applications of different name reactions like Dienone-phenol, Favorskii, Smiles, Brook, Neber, Stevens, Sommelet - Houser rearrangement reaction, etc.
- CO4:** Adapt the knowledge about photochemistry - photochemical reactions, their types and they will come to know the difference between thermal and photochemical reactions, laws of photochemistry. Also know the types of photochemical reactions, quenching and chemiluminescence.

Unit No.	Syllabus	No. of Lectures
Unit I:	Methods of determining reaction mechanism Kinetic Methods: Order and Molecularity, Methods of following reaction rates, Types of reactions: 1st, 2nd and 3rd order reactions; Reversible, Consecutive and Parallel reactions. Energy of Activation, Entropy of Activation, Effect of Ionic strength, Solvent effect and Kinetic isotopic effect	15 Hrs

	<p>Non-Kinetic Methods: Identification of reaction products, Testing of the possible intermediates, Trapping of the intermediates, Isotopic labelling, Reaction catalysis, Cross-over experiments, Stereochemical studies and Use of physical properties. Hammett and Taft equations.</p>	
Unit II:	<p>Pericyclic reactions Molecular orbital symmetry, Frontier orbital of ethylene, 1,3-butadiene, 1,3,5-hexatriene and allyl system, classification of pericyclic reaction, Wood-ward Hoffman correlation diagrams, FMO and PMO approach, electrocyclic reactions, conrotatory and disrotatory motions, $4n$, $4n+2$ and allyl systems, cycloaddition, and supra and antara facial additions, $4n$ and $4n+2$ systems, 2+2 additions of ketenes, 1,3-dipolar cycloaddition and chelotropic reactions, sigmatropic rearrangement , supra and antarafacial shifts of H, Sigmatropic shifts involving carbon moieties, (3,3) and (5,5) sigmatropic rearrangement and Claisen and Cope and Aza Cope rearrangement, Ene reaction.</p>	15 Hrs
Unit III:	<p>Study of following reactions Mechanism, Stereochemistry, migratory aptitude and applications of Dienone-phenol, Favorskii, Wolff, Smile's, Brook, Neber, Stevens, Sommelet-Hauser rearrangement, Eschenmoser fragmentation, von Richter reaction, Epoxide rearrangement with lewis acid.</p>	15 Hrs
Unit IV:	<p>Photochemistry Effect of light intensity on the rate of photochemical reactions, Types of photochemical reactions, photodissociation gas phase photolysis, photochemistry of alkynes, intramolecular reactions of the olefinic bonds, geometrical isomerism,</p>	8 Hrs

	cyclisation reactions, rearrangements of 1,4 and 1,5-dienes, photochemistry of carbonyl compounds, intramolecular reactions of carbonyl compounds saturated cyclic and acyclic α , β -unsaturated compounds, cyclohexadienones, intermolecular cycloaddition reactions, dimerisation and oxitane formation, photochemistry of aromatic compounds, photo fries reactions of anilides, photo fries rearrangements, Singlet molecular oxygen reactions, photochemistry of vision.	7 Hrs
--	---	--------------

RECOMMENDED BOOKS:

1. A guide book to mechanism in organic chemistry (orient- Longmans) - Peter Sykes
2. Organic Reaction Mechanism (Benjamin) - R. Breslow
3. Mechanism and structure in Organic Chemistry (Holt Reinhartwinston) - B. S. Gould
4. Organic chemistry (McGraaw Hill) - Hendrikson, cram and Hammond
5. Basic principles of organic chemistry (Benjamin) J. D. Roberts and M. C. Caeserio.
6. Reactive intermediates in organic chemistry, (J. Wiley) N. S. Issacs.
7. Organic reaction mechanism (McGraw Hill) R. K. Bansal
8. Fundamentals of photochemistry K. K. Rohtagi - Mukherji Wiley - Eastern
9. Essentials of molecular photochemistry, A. Gilbert and J. Baggott. Blackwell Scientific Publication.
- 10 Molecular photochemistry, N.J. Urro, W. A. Benjamin
11. Introductory photochemistry. Cox and T. Camp McGraw - Hill
12. Photochemistry R.P. Kundall and A. Gilbert. Thomson Nelson.
- 13 Organic photochemistry J. Coxon and B. Hallon Cambridge University press.

Paper No. - X: Advanced Spectroscopic Methods (CC - 1144 C)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Learn the principles and theory behind UV and IR spectroscopy and the concept of molecular vibrations occurring due to absorption of IR radiation and electronic excitations due to absorption of UV radiations so that students will be able to identify the structures of unknown organic compounds. They can identify the functional groups in organic compounds like alcohol, aldehyde, ketone, ester, aromatic compounds etc. They will learn overtones, combination bands and Fermi resonance FT-IR spectroscopic method.
- CO2:** Understand the recapitulation of proton NMR spectroscopy, Factors affecting coupling constants. Also learn how to analyse the first order spectra, simplification of complex spectra, complex spin-spin splitting of second order spectra. They will learn the effect of deuteration and spectra of Homotopic, Enantiotopic and Diastereotopic systems. Also adopt the knowledge of Advanced NMR technique and about Fourier transform technique, Nuclear overhauser effect (NOE), COSEY, NOSEY and resonance of F^{19} and P^{31} nuclei.
- CO3:** Learn the ion production - EI, CI, FD and FAB and factors affecting fragmentation analysis. Also understand the mass spectral fragmentation of different functional groups like aldehydes, ketones, esters, alcohols etc. so that they will be able to solve the problems on mass spectroscopy.

Unit No.	Syllabus	No. of Lectures
Unit I:	a) Ultraviolet Spectroscopy Woodward- Fisher rules for conjugated dienes and carbonyl compounds; Calculation of λ max, Ultraviolet spectra of aromatic and heterocyclic compounds, Steric effect in biphenyls.	05 Hrs

	<p>b) IR Spectroscopy</p> <p>Characteristic vibrational frequencies of alkanes; alkenes; alkynes; aromatic compounds; alcohols; ethers; phenols and amines. Detailed study of vibrational frequencies of carbonyl compounds [ketones; aldehydes; esters; amides; acids; anhydrides; lactones; lactams and conjugated carbonyl compounds] Effect of hydrogen bonding and solvent effect on vibrational frequencies; overtones; combination bands and Fermi resonance. FT-IR of gaseous; solids and polymeric materials.</p>	10 Hrs
Unit II:	<p>II: Proton NMR Spectroscopy</p> <p>a) Recapitulation of proton NMR spectroscopy, Factors affecting coupling constants (Karplus curve variation, dihedral angle, bond order, electronegativity), analysis of First order spectra, Complex spin-spin splitting of second order spectra, different spin systems (AB, AM, AX, ABX/AMX spin systems with examples). Simplification of complex spectra (High field strength, chiral resolving agent, effect of deuteration, nuclear magnetic double resonance, shift reagent, solvent effect); Spectra of Homotopic, Enantiotopic and Diastereotopic systems.</p> <p>b) Advanced NMR techniques</p> <p>Fourier transform technique, nuclear overhauser effect (NOE), COSY, NOESY, Resonance of other nuclei – ¹⁹F, ³¹P.</p>	<p>10 Hrs</p> <p>05 Hrs</p>
Unit III:	<p>Mass Spectrometry</p> <p>Introduction, ion production- EI, CI, FD and FAB, factors affecting fragmentation, ion analysis, ion abundance; Mass spectral fragmentation of aldehydes, ketones, aromatic hydrocarbons, carboxylic acids, ethers, alcohols, amines, nitro, cyano compounds; molecular ion peak, metastable ion</p>	15 Hrs

	peak; High resolution mass spectrometry (HRMS), MALDI, TOF; Problems associated with Mass Spectroscopy.	
Unit IV:	<p>a) Carbon-13 NMR Spectroscopy General introduction to ^{13}C NMR spectroscopy; chemical shift values [aliphatic, olefinic, alkyne, aromatic, heteroaromatic and carbonyl compounds]; proton coupled, proton decoupled ^{13}C NMR spectra, advanced ^{13}C NMR techniques (NOE, DEPT, Off resonance, HETCOR), Heteronuclear coupling, problems associated with ^{13}C NMR.</p> <p>b) Structural problems based on combined spectroscopic techniques (including reaction sequences)</p>	<p>07 Hrs</p> <p>08 Hrs</p>

RECOMMENDED BOOKS:

1. V.M. Parikh, Application spectroscopy of organic molecules. (Mehata)
2. D.W. Williams and Flemming, Spectroscopic methods of organic compound.
3. Silverstein and Basslar, Spectroscopic identification of organic compounds V.M. Parikh Absorption spectroscopy of organic molecules (J. Wiley)
4. P.S. Kalsi Spectroscopy of organic compounds (New age publisher)
5. J.R. Dyer. Application of absorption spectroscopy of organic compounds.
6. Jackman and Sterneil , Application of NMR spectroscopy
7. Nuclear magnetic resonance. J.D. Roberts (J. Wiley)
8. Theory and application of U.V. Jafee and Orchin.
9. Mass spectroscopy K. Benjamin.
10. The mass spectra of organic molecules. Beynon J H.
11. Interpretation of carbon 13 NMR Wehli F.W, Marchand A. P. (J. Wiley)
12. Organic Spectroscopy W. Kemp, ELBS
13. Instrumental methods of analysis CBS. Willard Merritt and Dean.
14. Mass Spectroscopy. Das and Jame
15. Organic structural spectroscopy : J. B. Lambert, S. Gronert, H. F. Shurvell, D. Lightneli, R. G. Cooks (Prentice Hall 2nd edition)

Paper No. - XI: Advanced Synthetic Methods (CC - 1145 C)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Understand the concept of disconnection approach through the introduction of synthons, synthetic equivalents and functional group interconversions. Also understand 1,2; 1,3; 1,4; 1,5 difunctional compounds, retrosynthesis of alkene, alkyne, alcohol, amines ...etc. importance of the order of reaction in organic synthesis, the meaning of the terms - Chemoselectivity, Regioselectivity, protecting groups. They will learn Diel's Alder reaction, Michael addition, Robinson annulation and what is mean by reversal of polarity i.e. Umpolung reaction.
- CO2:** Study the applications of different reagents like LDA, DCC, TBTH, lead tetra-acetate, etc. in chemical reactions like Woodward - Prevost hydroxylation, Barton and Shapiro reaction as well as applications of Periodic acid in Grub's catalysis.
- CO3:** Learn how the different metals like Pd, Mg, Rh, Tl, Si and Cu in Click chemistry.
- CO4:** Learn the new concept of supramolecular chemistry, advanced synthetic methods by using microwave oven, ultrasound waves, using the enzymes, electro-organic synthesis, use of multicomponent reactions as well as the use of Ionic liquids in chemical reactions.

Unit No.	Syllabus	No. of Lectures
Unit I:	Disconnection approach Introduction to Synthons and synthetic equivalents, disconnection approach, functional group interconversions. One group and two group disconnections in 1,2; 1,3; 1,4 & 1,5-difunctional compounds, Retro-synthesis of alkene, alkynes, alcohols, amines, carbonyl and 5,6 membered heterocyclic compounds. Importance of the Order of events in organic synthesis, Chemoselectivity, Regioselectivity,	15 Hrs

	Protecting groups, Diels-Alder reaction, Michael addition and Robinson annulations, Reversal of polarity (Umpolung).	
Unit II:	Application of the following reagents and reaction in synthesis Sodium cyanoborohydride, Lithium diisopropylamide (LDA) Dicyclohexylcarbodiimide (DCC), Tri-n-butyl tin hydride (TBTH), Per acids, Lead tetra acetate, Poly phosphoric acid (PPA), Diazomethane, Ozone, Phase transfer catalyst, Woodward-Prevost hydroxylation, Barton and Shapiro reaction, Hoffmann-Löffler-Fretag, Selenium dioxide, Dess-Martin periodinane, Periodic acid and Grub's catalysts.	15 Hrs
Unit III:	Applications of following metal in organic synthesis Pd, Mg, Rh, Ti, Si, use of Cu in Click chemistry	15 Hrs
Unit IV:	Application of the following in synthesis Supramolecular chemistry (use of crown ethers, cyclodextrins), Merrifield resin for synthesis of polypeptide, use of ferrites and metal nanoparticles in organic synthesis, Electro-organic synthesis, Enzyme catalyzed reaction in synthesis, Ionic liquids, Multi-component reactions, Microwave and Ultrasound techniques and their applications.	15 Hrs

RECOMMENDED BOOKS:

1. Designing of organic synthesis. S. Warren
2. Organic synthesis J. Fuhrhop & G. Penzlin. (2nd ed.)
3. Some modern methods of organic synthesis. Carruthres
4. Modern synthetic reaction. H.O. House
5. Reagent in organic synthesis. Fieser & Fieser
6. Principle of organic synthesis. R.O.C. Norman
7. Advanced organic Chemistry. Carey & Sundharg

8. Organic synthesis. P.E. Realand
9. Comprehensive organic Chemistry. Bartan and Ollis
10. Organic reactions. R.Admas
11. Advances in organometallic Chemistry. Stone & West
12. Transition metal intermediate in organic synthesis. C.W. Bird
13. Organometallic in organic synthesis. Swan & black
14. Synthesis of prostaglandins .A. Mitra
15. Total synthesis of natural products. John Apsimon
16. Polymers as aid in organic synthesis. M. K. Mathur, C. K. Narang & R.E. Williams
17. Polymer supported reaction in organic synthesis. P. Hodge & D.C. Sherrington
18. Enzyme catalysed reactions. C.J. Gray
19. Electroorganic Chemistry. T.Shona
20. Phase transfer catalyst in organic synthesis. Weber & Gokel.

Paper No. - XII: Drug and Heterocycles (CC - 1146C)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

CO1: a) Develop the new drugs, procedures followed in drug design, History and development quantitative structure activity relationship (QSAR). Also learn the concept of drug receptors and relationship between structure and chemical reactivity.

b) Learn about Antibiotics like beta-lactum, cephalosporin and SAR of both and understand the structural features of tetracycline & macrocyclic antibiotics.

CO2: Study the different types of drugs like Antimalarials, Anti- inflammatory, (e.g. Diclophenac), Anaesthetics, (e.g. lidocaine and thiopental), Antitubercular (Dapsone), Tranquilizers (Diazepam) etc. Also they can study about cardiovascular and Antineoplastic drugs.

CO3: a) Understand synthesis and reactions of five membered heterocycles - Furan, benzofuran, pyrrole, thiophene, and benzothiophene etc.

b) Learn the synthesis and reactions of six membered heterocycles like Pyridine, Quinoline and Coumarine.

CO4: a) Learn the synthesis and reactions of diazines and triazines. (six membered heterocycles).

b) Synthesis the reactions of azepines, oxepines & thiepinines. (seven membered heterocycles)

Part - A: DRUGS		
Unit No.	Syllabus	No. of Lectures
Unit I:	a) Drug design Development of new drugs, procedures followed in drug design. History and development of Quantitative structure activity relationship (QSAR). Concepts of drug receptors, Relation of chemical structure and chemical activity.	10 Hrs
	b) Study of Antibiotics	05 Hrs

	Synthesis and reactions of diazines & triazines. b) Seven membered Heterocycles Synthesis and reactions of azepines, oxepines & thiepinines.	07 Hrs
--	---	---------------

RECOMMENDED BOOKS:

1. Synthetic drugs, G. R. Chatwal
2. Medicinal Chemistry A. Kar.
- 3 Medicinal chemistry, P. Yogeshwari and D. Shriram
- 4 Medicinal chemistry Alka Gupta
- 5 Pharmaceutical manufacturing encyclopedia.
- 6 An introduction to chemistry of heterocyclic compounds. R. M. Acheson : (Interscience).
- 7 Heterocyclic chemistry. Joule & Smith : (Van Nostrand).
- 8 Heterocyclic chemistry. R. K. Bansal: (Wiley E).
- 9 Principals of modern heterocyclic chemistry. L. A. Paquette :
- 10 The structure and reactions of heterocyclic compounds. M. H. Palamer
- 11 Advances in Heterocyclic chemistry. A. R. Katritzky: (A.P.).
- 12 Organic chemistry (Vol. 1 & 2) Finar.
- 13 Outline of Biochemistry. Cohn & Stumpt
- 14 Introduction to the chemistry of enzyme action. Williams
- 15 The Organic Chemistry of Drug design and Drug action. R. B. Silverman
Academic press.
- 16 Strategies for Organic Drug synthesis and Design. D. Lednicer, J. Willey.
- 17 Heterocyclic Chemistry. Vol-1-3, R. R. Gupta, M. Kumar and V. Gupta, Springer
Veriag.
- 18 The Chemistry of Heterocycles. T. Eicher and S. Hauptmann, Thieme
- 19 Heterocyclic Chemistry. J. A. Joule, K. Mills and G. F. Smith, Chapman and Hall
- 20 Heterocyclic Chemistry. T. L. Gilchrist, Longman Scientific Technical
- 21 Contemporary Heterocyclic Chemistry. G. R. Nikome and W. W. Poudler, Willey
- 22 An Introduction to Heterocyclic Compounds., R. M. Acheson, J. Willey
- 23 Comprehensive Heterocyclic Chemistry. A. R. Katritzky and C. W. Rees

**M. Sc. Part - II (Semester-III) Organic Chemistry
Practical Course (CC - 1147C) and (CC - 1148C)**

A. Qualitative Analysis

1. Separation, purification and identification of compounds of ternary mixtures using **semimicroanalysis**,
2. TLC, column chromatography and chemical tests. IR spectra to be used for functional group identification.

B. Quantitative analysis 1. Two step Preparations

- a) Preparation of m-Nitroaniline
- b) Preparation of Benzanilide from benzophenone
- c) Preparation of o-Nitroaniline → o-Phenylene diamine → Benzimidazole
- d) Preparation of p-Cresol → p-Cresyl benzoate → 2-Hydroxy-5-methyl benzophenone
- e) Preparation of Anthranilic acid
- f) Structure elucidation by using given spectral data.

RECOMMENDED BOOKS:

1. Textbook of Practical Organic Chemistry - A. I. Vogel.
2. Practical Organic Chemistry - Mann & Saunders.
3. A Handbook of Quantitative & Qualitative Analysis- H. T. Clarke.
4. Organic Synthesis Collective Volumes by Blat

Vivekanand College (Autonomous), Kolhapur

M. Sc. Part - II (Organic Chemistry)

CBCS Syllabus with effect from June - 2019

Semester - IV

Paper XIII: Theoretical Organic Chemistry (CC - 1149D)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

CO1: Understand the concept of aromaticity in benzenoids, Huckel's rule, energy level of pi-molecular orbital, calculation of energies of cyclic and acyclic systems, different concepts of Huckel's as well as calculation of charge densities - PMO theory and reactivity index.

CO2: a) Learn synthesis and reactions of polycyclic aromatic compounds - Linear and Non linear polynuclear hydrocarbons.

b) Understand the concept of aromaticity and anti-aromaticity, the knowledge about 3- and 5- membered carbocyclic compounds, crown ethers complexes, cyclodextrins, catenanes and rotaxanes.

CO3: Understand the types of free radicals, their detection by ESR, free radical substitution reaction mechanism, and reactivity at an aromatic substrate, reactivity at a bridgehead and reactivity in attacking reagent. They also learn the effect of solvent on reactivity, Sandmeyer's reaction, Hunsdiecker reaction.

CO4: a) Learn about the Kinetic and thermodynamic control of reaction, they will get the knowledge about Nitration and sulphonation of naphthalene, about Wittig reaction, Enolization, F. C. reaction and Diel's Alder reaction.

b) Understand Non-classical carbonation - Formation, stability, reactivity and synthetic applications.

Unit No.	Syllabus	No. of Lectures
Unit I:	Molecular Orbital Theory Aromaticity in benzenoids, alternant and non alternant hydrocarbon, Huckels rule, energy level of pi- molecular	15 Hrs

	orbital and concept of aromaticity, calculation of energies of orbitals cyclic and acyclic systems. Determination energies and stabilities of different systems calculation of charge densities PMO theory and reactivity index.	
Unit II:	Benzenoid and Non benzenoid aromatic Compounds a) Polycyclic aromatic compounds: Synthesis, reactions, Linear and non-linear ortho fused polynuclear hydrocarbons. b) Introduction to Aromaticity and anti-aromaticity, Non-benzenoids compounds, Three and five membered carbocyclic compounds, Crown ether complexes, cyclodextrins, cryptands, catenanes and rotaxanes.	15 Hrs
Unit III:	Free radical reactions Types of free radical reactions, detection by ESR, free radical substitution mechanism, mechanism at an aromatic substrate, neighboring group assistance. Reactivity for aliphatic and aromatic substrates at a bridgehead. Reactivity in attacking radicals. The effect of solvent on reactivity. Allylic hydrogenation (NBS), oxidation of aldehydes to carboxylic acids, auto oxidation, coupling of alkynes and arylation of aromatic compounds by diazonium salt, Sandmeyer's reaction. Free radical rearrangement, Hunsdiecker reaction.	15 Hrs
Unit IV:	a) Kinetic and thermodynamic control of reactions Nitration and Sulphonation of naphthalene, Wittig, Enolization, Friedel-Crafts and Diels Alder reactions. b) Non-classical carbocations: Formation, stability, reactivity and synthetic applications.	07 Hrs 08 Hrs

RECOMMENDED BOOKS:

1. I. Lehar and Merchand: Orbital Symmetry.
2. R. B. Woodward and Hoffman: Conservation of orbital symmetry.
3. Kan: Organic Photochemistry
4. Coxon and Halton: Organic photochemistry
5. Arnold: Photochemistry
6. N. Turro: Modern molecular photochemistry.
7. Rohatgi- Mukherji: Fundamentals of photochemistry.
8. Ginsburg: Nonbenzenoid aromatic compound.
9. A. Streitwieser: Molecular orbital theory for organic chemistry.
10. E. Cler: The aromatic sextet.
11. Lloyd: Carbocyclic non- benzenoid aromatic compounds.
12. W. B. Smith: Molecular orbital methods in organic chemistry.
13. Jagdamba sing and L. D. S. Yadav Organic synthesis

Paper XIV: Stereochemistry (CC - 1150 D)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Adopt the knowledge of about stereoselective, stereospecific synthesis as well as chemoselective and regioselective reactions -enantioselective synthesis, reactions with hydride donor, catalytic hydrogenation via chiral hydrazones and oxazolines etc.
- CO2:** Understand the stereochemistry of acyclic and alicyclic compounds. A) Understand in depth Stability and Reactivity of diastereoisomers - Curtin-Hammett principle B) Some aspects of stereochemistry of ring compounds C) The shapes of the rings other than six membered rings (5, 6 and 7 membered rings). Also they will learn the conformational effects in medium sized rings and the concept of I-strain.
- CO3:** a) Knowledge about conformation and configuration fused bicyclic rings and bridged rings - Types, Nomenclature, stereochemical restrictions, and Bredt's rule.
b) Understand O. R. D. and C. D. - Types of curves, circular dichroism, the Octane rule and axial haloketone rule.
- CO4:** Explain the stereochemistry of Allenes, Spiranes, and Biphenyls and how to assign the configuration and by using physical and chemical methods.

Unit No.	Syllabus	No. of Lectures
Unit I:	Newer methods of stereoselective synthesis Introduction, Stereoselective, Stereospecific, Chemoselective and regioselective reactions; Enantioselective synthesis (chiral approach) reactions with hydride donors, hydroboration, catalytic hydrogenation via chiral hydrazones and oxazolines, Sharpless epoxidation, Diels Alder selective synthesis.	15 Hrs

Unit II:	Stereochemistry of acyclic and alicyclic compounds A) Conformation and reactivity in acyclic compounds and of cyclohexanes. Stability and Reactivity of diastereoisomers. Curtin- Hammett principle. B) Some aspects of the stereochemistry of ring systems: Stereoisomerism and determination of the configuration of alicyclic rings; Stability of rings and ease of rings formation C) The shapes of the rings other than six membered: Shapes of five, six, and seven membered rings. Conformational effects In medium sized rings, Concept of 'I' strain	05 Hrs 05 Hrs 05 Hrs
Unit III:	Stereochemistry of the ring system, conformation and configuration a) Fused and bridged rings: Fused bicyclic ring systems: Types of fused ring systems, Cis and trans-Decalins, Perhydroanthracene, Perhydrophenanthrene; Bridged rings: Types of bridged ring systems, Nomenclature, stereochemical restrictions, and Bredt's rule. b) O.R.D. and C.D.: Types of curves, circular dichroism, Determination of the conformation and configuration, The Octant rule and axial haloketone rule.	08 Hrs 07 Hrs
Unit IV:	Stereochemistry of compounds containing no chiral carbon atoms and diastereoisomerism (Geometrical isomerism). a) Stereochemistry of Allenes, Spiranes and Biphenyls Assignment of configuration b) Configuration of diastereomers (Geometrical isomerism) based on physical and chemical methods.	08 Hrs 07 Hrs

RECOMMENDED BOOKS:

1. E.L. Eliel: Stereochemistry of carbon compounds.
2. D. Nasipuri: Stereochemistry of organic compounds
3. P.S. Kalsi: Stereochemistry, Conformation and Mechanism.
4. Eliel, Allinger, Angyal and Morrison: Conformational analysis.
5. Hallas: Organic stereochemistry
6. Mislow and Benjamin: Introduction to Stereochemistry.
7. H. Kagan: Organic stereochemistry.
8. Carl Djerassi; Optical Rotatory Dispersion.
9. P. Crabbe: Optical Rotatory Dispersion and C.D.

Paper XIV: Chemistry of Natural Products (CC - 1151 D)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** a) Learn the classification and isolation methods of Natural Products.
b) Reveal the classification and isolation methods of terpenoids - structure and synthesis of - Camphor, Carvone, Abietic acid, zingiberene, alpha-santonin and beta-caryophyllene.
- CO2:** Know all about Alkaloids - the occurrence, isolation, structures, functions, stereochemistry and synthesis of the major Alkaloids like - Morphine, Reserpine, Atropine and Conin.
- CO3:** a) Learn the occurrence, nomenclature, basic skeleton of steroids and study the synthesis of hormones like cholesterol, Androsterone, Testosterone, Estrone etc.
b) Study the nomenclature, classification, biogenesis, physiological effects and synthesis of prostaglandin PGE2 and PGF2.
- CO4:** Study about the Vitamins - Classification, Nomenclature, Source, effects due to deficiency, synthesis and biological functions of vitamin B1, B2, B5, B6 and Biotin i.e. vitamin H.

Unit No.	Syllabus	No. of Lectures
Unit I:	a) Introduction of natural products Classification and isolation methods.	03 Hrs
	b) Terpenoids Introduction of natural products: Classification and isolation methods. Structure and synthesis of camphor, carvone, abietic acid, zingiberene, α -santonin, β -cuparenone and β -caryophyllene.	12 Hrs

Unit II:	Alkaloids Introduction, occurrence, isolation and functions of alkaloids, Structure, stereochemistry and synthesis of the following: Morphine, Reserpine, Atropine and Conin.	15 Hrs
Unit III:	a)Steroids Occurrence, nomenclature, basic skeleton, Diels hydrocarbon. Study of the following Hormones: Cholesterol, Androsterone, Testosterone, Estrone, Progesterone, Aldosterone and Cortisone (only synthesis). b)Prostaglandins Occurrence, nomenclature, classification, biogenesis and physiological effects, Synthesis of PGE ₂ and PGF ₂	10 Hrs 05 Hrs
Unit IV:	Vitamins Introduction of Vitamins, Classification and nomenclature of Vitamins, Sources of vitamins and their deficiency, Synthesis, structure and biological functions of vitamin B ₁ , B ₂ , B ₅ , B ₆ and Biotin (Vitamin H).	15 Hrs

RECOMMENDED BOOKS:

1. O. P. Agarwal: Chemistry of organic natural products vol. I & II
2. Gurdeep Chatwal: Organic chemistry of Natural products vol. I & II
3. Jain, Sahai, Pimplapure, Soni: Chemistry of Natural products
4. P. D B. Mayo: The chemistry of natural products.
5. Simonson: Terpenes.
6. T.W. Goddwin: Aspects of terpenoid chemistry and biochemistry.
7. Woguer: Vitamins and Co- enzymes.

Paper XV: Applied Organic Chemistry (CC - 1152 D)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Learn about the synthesis and uses of different types of Agrochemicals - Carbamates (carbaryl, Aldicarb, Ziram and Zineb), Organophosphorous insecticides (malathion, monocrotophos, mevinphos etc.), Natural and Synthetic Pyrethroids - structures classification and their synthesis. They will learn synthesis of some plant growth regulators as well as synthesis and applications of Juvenile hormones and Pheromones (bombykol, grandisol and disparlure).
- CO2:** Learn about the perfumery compounds - commercial process, preparation and importance of essential oils, synthesis of 2 - phenyl ethanol, yara-yara, vanillin, synthetic musk, jasmine, ionone etc. from citral, phenyl acetate ester, benzyl acetate ester.
- CO3:** Understand classification, synthesis of azo dyes, reactive dyes, optical brighteners, dispersed dyes etc. by nitration, sulphonation and diazotization reactions.
- CO4:** Understand about Polymers: the mechanism of polymerization with some examples - polyesters, polyamide, PVC, etc. Also they will study about manufacturing processes of synthetic rubber like butadiene - styrene, formaldehyde resin, about plasticizers, anti-oxidents required for natural polymers like starch and cellulose. They will get the knowledge about Oxo and Wacker process necessary for Soap and Synthetic detergents.

Unit No.	Syllabus	No. of Lectures
Unit I:	Agrochemical a. Carbamate pesticides: Introduction and synthesis of carbaryl, carbofuran, Baygon, Aldicarb, Ziram, Zineb. b. Organophosphorus pesticides: Malathion, monocrotophos, dimethoate, phorate, mevinphos, chloropyriphos. c. Natural and synthetic pyrethroids: Isolation and structures	15 Hrs

	<p>of natural allethrin, fenvalerate, cypermethrin.</p> <p>d. Plant growth regulators: General survey and synthesis of simple compounds and applications.</p> <p>e. Insect repellents: General survey, synthesis and applications.</p> <p>f. Juvenile hormone: introduction & structures JHA importance synthesis</p> <p>Pheromones: introduction, examples, and importance in IPM.</p> <p>Synthesis of juvabione bombykol, grandisol and disparlure.</p>	
Unit II:	<p>Synthesis and applications of perfumery</p> <p>Introduction to perfumery compounds and its commercial process, essential oil, method of preparation and important, synthesis of 2-Phenylethanol, Yara-yara, vanillin and other food flavours, synthetic musk, Jasmone, ionones, β-ionones from citral, phenyl acetic acid and its ester, benzyl acetate.</p>	15 Hrs
Unit III:	<p>Dyes and Intermediates</p> <p>Classification and synthesis of important dye intermediates by using nitration, sulphonation, diazotization reactions. Commercial processes for azo-dyes, reactive dyes, optical brighteners, thermal sensitive dyes, dispersed dyes and reactive dyes.</p>	15 Hrs
Unit IV:	<p>Polymers</p> <p>Mechanism of polymerization. Study of polyesters, polyamides, PVC, polystyrene, polyvinyl acetate and polyvinyl alcohol, polyethenes, viscose rayon, synthesis of polyethylene, polypropylene. Synthetic rubbers: Styrene-butadiene, butyl polyisoprene, phenol formaldehyde resin. Plasticizers and anti - oxidants for polymers, natural</p>	15 Hrs

	polymers: starch and cellulose. Applications of Oxo and Wacker process ; Soaps and Synthetic detergents.	
--	---	--

RECOMMENDED BOOKS:

1. Allan: Colour Chemistry
2. K. Venkataraman: Chemistry of Synthetic Dyes Vol - 1 to 7
3. Abrahart: Dyes & their intermediates
4. N. N. Melikov: The Chemistry of Pesticides and formulations
5. K. H. Buchel: Chemistry of Pesticides.
6. R. Clemlyn: Pesticides
7. K. H. Buchel: Chemistry of Pesticides
8. H. R. Alcock and F. W. Lambe: Contemporary Polymer Chemistry
9. J. M. G. Cowie, Blackie: Physics & Chemistry of Polymers
10. P. H. Groggins: Unit Processes in Organic Synthesis
11. B. Biollot& P. V. Wells: Perfumary Technology
12. M. Ash & I. Ash: A formulary of Cosmetic Preparations

Paper XVI (A): Elective Paper: Bioorganic Chemistry (CC - 1153 D)
Theory: 60hrs

Unit No.	Syllabus	No. of Lectures
Unit I:	<p>a) Cell Structure and Functions Structure of prokaryotic and eukaryotic cells, Intracellular organelles and their functions, comparison of plant and animal cells. Overview of metabolic process- catabolism and anabolism. ATP - the biological energy currency. Origin of life- unique properties of carbon, chemical evolution and rise of living system. Introduction to biomolecules, building blocks of biomacromolecules.</p> <p>b) Enzymes Structure activity and reactions, catalyzed determination of active site, inhibition mechanism chemical transformations using enzymes.</p>	10 Hrs
Unit II:	<p>Carbohydrates Conformation of monosaccharides, structure and functions of important derivatives of monosaccharides like glycosides, deoxy sugars, myoinositol, amino sugars. Nacetylmuramic acid, sialic acid disaccharides and polysaccharides. Structural polysaccharides- cellulose and chitin. Storage polysaccharides- starch and glycogen.</p>	15 Hrs
Unit III:	<p>Lipids Fatty acids, essential fatty acids, structures and function of triglycerides, glycerophospholipids, sphingolipids, cholesterol, bile acids, prostaglandins. Lipoproteins composition and function, role in atherosclerosis. Properties of lipid aggregates</p>	15 Hrs

	- micelles, bilayers, liposomes and their possible biological functions. Biological membranes. Fluid mosaic model of membrane structure. Lipid metabolism - β -oxidation of fatty acids	
Unit IV:	<p>a) Amino acids, Peptides and Proteins</p> <p>Chemical and enzymatic hydrolysis of proteins to peptides, amino acid sequencing. Secondary structure of protein, forces responsible for holding of secondary structures. α- helix, β-sheets, super secondary structure, triple helix structure of collagen. Tertiary structure of protein- folding and domain structure. Quaternary structure. Amino acid metabolism degradation and biosynthesis of amino acids, sequence determination: chemical/ enzymatic/ mass spectral, racemization / detection. Chemistry of oxytocin and tryptophan releasing hormone (TRH).</p> <p>b) Nucleic Acids</p> <p>Purine and pyrimidine of nucleic acids, base pairing via H - bonding. Structure of ribonucleic acids (RNA) and deoxyribonucleic acid (DNA), double helix model of DNA and forces responsible for holding it. Chemical and enzymatic hydrolysis of nucleic acids. The chemical basis for heredity, an overview of replication of DNA, transcription, translation and genetic code. Chemical synthesis of mono and poly nucleosides.</p>	<p>10 Hrs</p> <p>05 Hrs</p>

RECOMMENDED BOOKS:

1. Principles of Biochemistry, A. L. Lehinger, Worth Publications.
2. Biochemistry, L. Stryer, W. H. Freeman
3. Biochemistry, J. David Rawn, Neil Patterson.
4. Biochemistry, Voet and Voet, John Wiley.
5. Outlines of Biochemistry, E. E. Conn and P. K. Stumpf, John Wiley.

M. Sc. Part - II (Sem-IV) Organic Chemistry
Practical Course (CC - 1154B) and (CC - 1155B)
Practical courses include Submission of project work.

A. Estimation of Sulphur and Nitrogen.

B. Organic preparations: Three stage preparations starting with 5g or less and TLC

1. Preparation of o-Chloro benzoic acid.
2. Preparation of p- Amino benzoic acid.
3. Preparation of p- Chloro nitrobenzene by Sandmeyer reaction.
4. Preparation of p- Iodonitrobenzene by Sandmeyer reaction.
5. Preparation of p-Iodoazobenzene.
6. Multi-component synthesis

C. Project: Literature survey. Studies of reactions, synthesis, mechanism, isolation of products, standardization of reaction conditions, use of new methods etc. Identification of organic compounds by spectroscopic methods. External and internal examiners will examine the project (50 Marks) jointly at the time of practical examination.

D. Any other suitable experiments may be added.

E. Study tour is compulsory for M.Sc. Part- II Students to visit Chemical Industries in India.

REFERENCE BOOKS:

1. A Textbook of Practical Organic Chemistry - A. I. Vogel.
2. Practical Organic Chemistry - Mann & Saunders
3. A Handbook of Quantitative & Qualitative Analysis - H. T. Clarke
4. Organic Synthesis Collective Volumes.

Scheme of teaching and examination

- The semester examination will be conducted at the end of each term (both theory and practical examination)
- Theory paper will be of 80 marks each and 20 marks for internal evaluation test conducted in the mid of the term. Two practicals will be of 100 marks each.
- Question papers will be set in the view of the entire syllabus and preferably covering each unit of the syllabus.

Nature of Question Paper and Scheme of Marking

1. There shall be 7 questions carrying 16 marks each.
2. Question No. 1 is compulsory. It consists of fill in the banks, objective or answer in one sentence type questions.
3. The remaining question No. 2 to 7 are divided into two sections (Section I and II).
4. Section I consists of question No 2, 3 and 4.
5. Section II consists of question No 5, 6 and 7.
6. Questions 2 to 6 consists of 2 or 3 sub questions.
7. Question No 7 consists of sub questions in which students have to write short notes on any three or four sub questions among the given options.

Nature of Question Paper

M.Sc. (Part-I/II) Semester-I/II/III/IV (CBCS) Examination

Name of the Paper (Paper No.....)

Sub. Code:

Day & Date: _____

Time: _____

Total Marks: 80

-
- Instructions:**
- 1) Question one is compulsory.
 - 2) Attempt any 'TWO' questions from each section.
 - 3) All questions carry equal marks.
 - 4) Figures to the right indicate full marks.
 - 5) Neat and labelled diagram should be drawn wherever necessary.

Q. 1) Answer the following. (One mark each) [16]

SECTION-I

Q. 2) i. [8]

ii. [4]

iii. [4]

Q. 3) i. [8]

ii. [4]

iii. [4]

Q. 4) i. [8]

ii. [4]

iii. [4]

SECTION-II

Q. 5) i. [8]

ii. [4]

iii. [4]

Q. 6) i. [8]

ii. [8]

Q. 7)

Write a note on. (any four)

[16]

i.

ii.

iii.

iv.

v.

vi.

Dissemination of Education for Knowledge, Science and Culture”

- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)**



DEPARTMENT OF CHEMISTRY

**M. Sc. Part - II Inorganic Chemistry
Semester-III & IV**

SYLLABUS

Under Choice Based Credit System

to be implemented from Academic Year 2022-23

Vivekanand College, Kolhapur (Autonomous)
Department of Chemistry
M. Sc. Part-II, (Sem III and IV)
Inorganic Chemistry Syllabus (CBCS) 2022 - 23

Total No. of Semester – 02

Total No. of Papers – 08

No. of papers (theory) per semester – 04

No. of practical course per semester – 02

Maximum marks per paper (practical) -100

Distribution of Marks – Internal evaluation - 20

External evaluation - 80

(Semester exam.)

Total Marks for M. Sc. Degree

Theory Paper: 1600

Practical course: 800

Total: 2400

Course Structure

Sr. No.	Paper No.	Course code	Course Name	Teaching Scheme		Examination Scheme and Marks				Course Credits
				Hours/week		ESE	CIE	PR	Marks	
				TH	PR					
Semester-III										
COMPULSORY COURSE										
1	IX	CC - 2100C	Inorganic Chemical Spectroscopy	4	-	80	20	-	100	4
2	X	CC - 2101C	Organometallic and Bioinorganic Chemistry	4	-	80	20	-	100	4
3	XI	CC - 2102C	Coordination Chemistry - I	4	-	80	20	-	100	4
ELECTIVE PAPERS										
4	XII(A)	CC - 2103C	Material Science	4	-	80	20	-	100	4

5	XII(B)	CC - 2104C	Nuclear Chemistry	4	-	80	20	-	100	4
6		CC - 2105C	Practical Course: V	4	-	-	-	100	100	4
7		CC - 2105C	Practical Course: VI	4	-	-	-	100	100	4
				16	08	320	80	200	600	24
Semester-IV										
COMPULSORY COURSE										
1	XIII	CC - 2106D	Instrumental Techniques	4	-	80	20	-	100	4
2	XIV	CC - 2107D	Coordination Chemistry - II	4	-	80	20	-	100	4
3	XV	CC - 2108D	Energy and Environmental Chemistry	4	-	80	20	-	100	4
ELECTIVE PAPERS										
4	XVI(A)	CC - 2109D	Inorganic Nanomaterials	4	-	80	20	-	100	4
5	XVI(B)	CC - 2110D	Radiation Chemistry	4	-	80	20	-	100	4
6		CC - 2111D	Practical Course: VII	4	-	-	-	100	100	4
7		CC - 2111D	Practical Course: VIII	4	-	-	-	100	100	4
				16	08	320	80	200	600	24
Total (Sem. III & IV)				32	16	640	160	400	1200	48

Vivekanand College, Kolhapur (Autonomous)

M. Sc. Part - II (Inorganic Chemistry)

CBCS Syllabus with effect from June - 2022

Semester - III

Paper No. - IX: Inorganic Chemical Spectroscopy (CC - 2100C)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Interpret the symmetry elements and their operations as required to specify molecular symmetry and possible point groups from symmetry elements and be able to find point group of molecules by systemic procedure.
- CO2:** Explain the principle and instrumentation of infra-red (IR) and Raman spectroscopy and interpret infrared and Raman spectra for chemical analysis inorganic compounds.
- CO3:** Explain the principle and instrumentation of Mass spectroscopy and interpret Mass spectrum for chemical analysis of inorganic compounds.
- CO4:** Explain the principle and instrumentation of nuclear magnetic resonance (NMR) and X-ray photoelectron spectroscopy (XPS) and interpret the spectrum for chemical analysis of inorganic compounds.

Unit No.	Syllabus	No. of Lectures
Unit I:	Molecular Symmetry and Group Theory Introduction to symmetry, Symmetry operations, Symmetry elements, Point group and its classification (C _n -type, D _n -type and Special-type), Schoenflies symbol for point groups, Determination of point group for AB ₂ (Bent), AB ₃ (Trigonal pyramid), AB ₃ (Trigonal Planar), AB ₄ (Square planar), AB ₅ (Trigonal bipyramidal), AB ₆ (Octahedral), CO ₂ , HCl, CO, ortho-, meta- and para-disubstituted benzene molecules. Symmetry, dipole moment and optical activity of molecules, Group and its properties, Group multiplication table, Matrix representation of symmetry elements.	15 Hrs

	<p>nucleus of ^{195}Ag & ^{119}Sn, Applications of solid-state NMR technique.</p> <p>B) X-ray Photo electron Spectroscopy (XPS): Introduction and basic theory, Instrumentation, Sample selection and preparation, Spectral analysis, Argon ion sputtering technique, Applications of XPS.</p>	<p>7 Hrs</p>
--	---	--------------

Reference Books:

1. K. Burger, Coordination Chemistry-experimental methods, Butterworth's
2. R. Drago: Physical method in Inorganic Chemistry, DUSAP.
3. Hill & Day advanced methods in Inorganic Chemistry, J. Wiley
4. F.A. Cotton, chemical application of group theory, Wiley eastern
5. Figgis, Introduction to ligand field theory field
6. Schaefer & Gilman: Basic principles of ligand field Theory, J. Wiley
7. P.R. Backer: Molecular symmetry and Spectroscopy A.P.
8. Ferraro Ziomek, Introduction to Group theory, plenum
9. Scotland Molecular symmetry DVN
10. Dorian: symmetry in Chemistry EWAP
11. Hall: Group theory and symmetry in Chemistry MGLt
12. Nakamoto Infrared R Raman Spectra of Inorganic & Coordination compounds, J. Wiley
13. Nakanisha: Spectroscopy and structure J. Wiley
14. Ferrero: Metal ligand and related vibrations
15. CNR Rao Spectroscopy in Inorganic Chemistry Vol I, II, III
16. Durie: vibrations spectra and structure Vol. I to IV, Elsevier
17. Dudd, chemical Spectroscopy Elsevier
18. Popel: H.N.M.R. Spectroscopy J. Wiley
19. R.J. Abraham, J. Fisher and P Loftus Wiley Introduction to NMR spectroscopy.
20. P.K. Bhattacharya: Group Theory & Its Chemical Applications
21. K.V. Reddy: Symmetry & spectroscopy of Molecules.
22. M. R. Litzow and T R Spelding, Mass Spectroscopy of Inorganic & Organometallic Compounds, Elsevier, 73.

Paper No. - X: Organometallic and Bioinorganic Chemistry
(CC - 2101C) Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Explain methods of properties, preparation, stability and applications of organometallic compounds in organic synthesis.
- CO2:** Interpret structure and bonding transition metal pi-complexes and their applications in organic synthesis relating to nucleophilic and electrophilic attack on ligands.
- CO3:** Get a basic understanding of medicinal use of metal complexes as antibacterial, antiviral, antibiotics and related compounds.
- CO4:** Understand transport and storage of dioxygen through different carriers, Study Electron Transfer in Biology involving metalloproteins and cytochromes and Role of Metals in Medicine.

Unit No.	Syllabus	No. of Lectures
Unit I:	Organo transition Metal Chemistry A] Alkyls and Aryls of Transition Metals: Types, Routes of synthesis, Stability and decomposition pathways, Organocopper compounds of alkyls and aryls in synthesis. B] Compounds of Transition Metal: Metal-carbon multiple bonds: Alkylidenes, alkylidynes, low valent carbenes and carbines, Synthesis, Nature of bonds, Structural characteristics, Nucleophilic and electrophilic reactions on ligands, Applications in organic synthesis.	15 Hrs

Unit II:	Transition Metal π-Complexes Metal-carbon multiple bonds, Nature of bonding, Structural characteristics and Synthesis, Properties of transition metal π -complexes with unsaturated organic molecules: alkenes, alkynes, allyl, diene, dienyl, arene and trienyl complexes, Applications of transition metal π complexes and their intermediates in organic synthesis relating to nucleophilic and electrophilic attack on ligands.	15 Hrs
Unit III:	Metal Compounds in Medicine Medicinal uses of metal complexes as antibacterial, anticancer ,antibiotics and antiviral activity of metal complexes, Use of cis-platin as antitumor drug, Metal deficiency and diseases: iron, zinc and copper deficiency, Use of metals and metal compounds in the diagnosis and chemotherapy, Chemotherapy with compounds of some non essential elements; Chelate therapy, Gold and gold complexes as anticancer drugs and their use in therapy of Rheumatic-Arthritis, Use of Lithium complexes as psycho pharmacological drugs.	15 Hrs
Unit IV:	Oxygen Transport and Storage Hemocyanins and hemerythrin, Synthetic oxygen carriers: Collmans compound; Vaskas complex; Co(II) Schiff base complexes and Perflurochemicals (PFCs), Perutz mechanism for structural changes in porphyrin ring system, Oxygenation and deoxygenation, Oxygen adsorption isotherm and cooperativity, Role of globin chain in gaemoglobin, Siderophores, Vanadium compounds as insulin mimetic agents in the treatment of diabetics.	15 Hrs

Reference Books:

1. Bioinorganic Chemistry, A. K. Das
2. Organometallic and Bioinorganic Chemistry, Ajaykumar
3. Bioinorganic Chemistry, K. Hussain Reddy
4. Organometallic Compounds, Dr. Indrajeet Kumar, Pragati Prakashan Meerut
5. Yamamoto, Organo Transition Metal Chemistry, Wiley (1986).
6. R. H. Crabtree, The Organometallic Chemistry of the Transition Metals (4th edn.), John Wiley (2005).
7. A. J. Pearson. Metallo-Organic Chemistry, John Wiley & Sons (1985).
8. M. Bochmann. Organometallics-I Complexes with Transition Metal-Carbon σ -Bonds, 13 Oxford Chemistry Primers (1994).
9. Principles of Biochemistry, A. L. Lehinger, Worth Publications.
10. Biochemistry, L. Stryer, W. H. Freeman
11. D. F. Shriver, P. W. Atkins and C. H. Langford, Inorganic Chemistry, Oxford Univ. Press, 1990.
12. J. E. Huheey, E. A. Keiter and R.L. Keiter Inorganic Chemistry, Principles of Structure and Reactivity, Pearson Education, 2004.
13. S. J. Lippard and J. M. Berg, Principles of Bioinorganic Chemistry, Univ. Science Books, 1994.
14. W. Kaim and B. Schwederski, Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life (An introduction and Guide), John Wiley & Sons, 1994.

Paper No. - XI: Co-ordination chemistry-I (CC - 2102C)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Know the fundamentals in photochemistry, to explain different types of photochemical reactions and photochemistry of coordination compounds.
- CO2:** Explain non-chelate forming and chelate forming reactions.
- CO3:** Understand Magnetic properties of Complexes and explain with respect to spin orbit coupling.
- CO4:** Understand and explain mixed ligand complexes and use of transition metal complexes in catalysis.

Unit No.	Syllabus	No. of Lectures
Unit I:	Photochemistry of Metal Complexes Absorption, Excitation, Photochemical laws, Quantum yield, Electronically excited states of Metal complexes, Types of photochemical reactions; substitution reactions, rearrangement reactions and redox reactions, Photochemistry of coordination compounds, Charge transfer spectra, Charge transfer excitations, Methods for obtaining charge transfer spectra.	15 Hrs
Unit II:	Reactions of Coordinated Ligands A] Non-chelate forming reactions: Reaction of donor atoms (Halogenation of coordinated N, Alkylation of coordinated S and N, Solvolysis of coordinated P atoms), Reactions of nondonor atoms (nucleophilic and electrophilic behaviour of ligands). B] Chelate ring forming reactions: Reactions involving thermodynamic template and kinetic effects.	15 Hrs
Unit III:	Magnetic Properties of Transition Metal Complexes Introduction, Types of magnetic behaviour, Diamagnetism,	15 Hrs

	Origin of paramagnetism, Temperature dependent paramagnetism, Spin-orbit interaction, Pascal constants, Ferromagnetism and antiferromagnetism of metal complexes, Van Vleck's equation: derivation and applications, Spin orbit coupling and magnetic moment, Spins crossover phenomenon, Determination of magnetic susceptibility.	
Unit IV:	<p>Mixed Ligand Complexes and Catalysis of Transition Metal Complexes</p> <p>A] Mixed ligand complexes Stabilities and dynamics of formation of ternary complexes, Reaction of coordination ligand in ternary complexes, Mimicking reactions in biological systems, Enzyme models, Amino acids, ester hydrolysis, Peptide synthesis and its hydrolysis, Detarbodylation of β keto acids.</p> <p>B] Catalysis of transition metal complexes Introduction, General principle, Catalysis by transition metal complexes, Oxidation of hydrocarbons by O_2, Oxidation, polymerization and hydrogenation of olefins, Metal complex catalyzed reactions of arenes, Catalysis in condensation polymerization, Current and future trends in catalysis.</p>	<p>7 Hrs</p> <p>8 Hrs</p>

Reference Books:

1. K. K. Rastogi and Mukharjee, Fundamentals of Photochemistry, Wiley eastern.
2. J. G. Calverts and J. N. Pitts, Photochemicals of Photochemistry, John Wiley.
3. Wells, Introduction to 4Photochemistry.
4. V. Balzani & V. Cavassiti, Photochemistry of Coordination compounds, AP, London, 1970. 5. Comprehensive Coordination Chemistry, Vol.1. G Wilkinson (Ed) Wiley, New York, 1967.
6. Inorganic Chemistry by J.E. Huheey, E.A. Keiter and R.L. Keiter 4th edn. Harper Collins, 1993
7. Mechanisms of Inorganic Reactions, by C.F. Basolo and R.G. Pearson, Wiley, New York, 1967

8. Earnshaw: Introduction to Magneto Chemistry
- 9 Mabbs & Machin Magnetism & transition metal complexes Chamman hall
10. Calvin, Magnetic properties of transition metal complexes.
11. L.N. Maley: Magneto Chemistry
12. Datta & Shymalal: Elements of Magneto Chemistry
13. James E. Huheey: Inorganic Chemistry Principles of Structure and reactivity, Harber & Row, Publishers Inc. New York 1972.
14. K.P. Purcell & J.C. Kote: An Introduction to Inorganic Chemistry Holt Sounders, Japan 1980.
15. William L. Jolly: Modern Inorganic Chemistry, Mecgrow Hill USA,1984
16. F.A. Cotton & R.G. Willkinson: Advanced Inorganic Chemistry.

Paper No. - XII (A): Material Science (CC - 2103C)

Theory: 60hrs

Course Outcomes: After the completion of the course the student will be able to:

- CO1:** Explain mechanism of superconductors, classify super conductors, explain BCS theory of superconductivity and know the applications of different materials.
- CO2:** Explain magnetic materials and their applications in different fields.
- CO3:** Explore new areas of research in both ceramics and composite materials manufacturing.
- CO4:** Understand and apply core principles and concepts in catalysis using different inorganic complexes as catalyst.

Unit No.	Syllabus	No. of Lectures
Unit I:	Superconductivity Materials, Crystal defects and Non stoichiometry A] Superconductivity materials: Introduction, Superconductivity, Critical temperature, Critical field, BCS theory, Properties and classification of superconductors, High Tc superconductors; examples with structure and applications, Fullerenes, Intermetallic superconductors; synthesis, applications. B] Crystal defects and non-stoichiometry: Point defects: vacancies, interstitials, impurities, expression for schottky and frenkel defects. Line defects: edge and screw dislocation. Stacking faults in grain boundaries, Phase transformation in solids, Solid state reactions and crystal growth, Preparation methods of solids.	15 Hrs

Unit II:	Magnetic Materials Introduction, Atomic magnetism and solids, Types of magnetic materials, Exchange interactions, Magnetic order (Ferro, Antiferro and Ferri), Hysteresis loop and their classification, Calculation of magnetic moment from saturation magnetization, Magnetic domains, Examples of magnetic materials, Soft and hard ferrites, Structure and magnetic interactions in spinel, Garnet hexagonal ferrites, Application of magnetic materials	15 Hrs
Unit III:	Ceramic and Composite Materials Ceramic Materials: Classification of ceramics, Dielectric and polarization properties of ceramics, Piezo, pyro and ferro-electric effect of ceramics, Sol-gel processing of ceramics. Examples and application of ceramics: oxides, carbides, borides, nitrides. Composite Materials: Introduction, Glass transition temperature, Fibers for reinforced plastic composite materials (glass fibers, carbon fibres, and aramid fibers), Concretes and asphalt materials. Application of composite materials.	15 Hrs
Unit IV:	Catalysis Basic principle, Thermodynamic and Kinetic aspects, Industrial requirements, classification, theories of catalysis, Homogeneous and heterogeneous catalysis, Types and characteristics of substrate-catalyst interactions, Kinetics and energetic aspects of catalysis, Selectivity, stereochemistry, orbital symmetry and reactivity. Catalytic reactions of coordination and organometallic compounds including polymerization activation of small molecules, addition to multiple bonds, hydrogenation, Zeigler-Natta polymerization of olefins, Monsanto acetic acid process.	15 Hrs

Reference Books:

1. Solid state Chemistry: An Introduction - L.E. Smart & E.A. Moore, CRC, Taylor & Francis, 3rd Edn.
2. Materials Science & Engineering - V. Raghvan, 2nd Edn.
3. Introduction to Solids - L.V. Azarroff, 2nd Edn. 1980
4. Elements of materials science and engineering - Van Vleck, 5th Edn.
5. Insight to Speciality Inorganic Chemicals - D. Thompson, Royal Society of Chemistry, 1995.

Paper No. - XII (B): Nuclear Chemistry (CC - 2104C)

Theory: 60hrs

Course Outcomes: After the completion of the course the student will be able to:

- CO1:** Understand types of radioactive decay, natural decay series, nuclear models, nuclear properties, Mass energy, relationships, nuclear reactions, rates of radioactive decay, interaction of radiation with matter.
- CO2:** Explain nuclear structure and stability, define binding energy and mass defect and be to calculate each for a given nucleus, understand nuclear models to understand nuclear structure and their properties.
- CO3:** Identify and define various types of nuclear changes or processes including fission, fusion and decay reactions, to understand nuclear reactions and mechanism behind that.
- CO4:** Understand the basics of nuclear chemistry applications: nuclear power, nuclear reactor, medical treatment, isotopic labelling, and carbon dating.

Unit No.	Syllabus	No. of Lectures
Unit I:	Systematic Study of Alpha, Beta and Gamma Decays Alpha, beta and gamma decay, Energy curve, Spectra of alpha and beta particles, Giger Nuttal law, Theory of alpha decay, Penetration of potential barrier, Range of energy relationship, Sergeants curve, Fermi theory of beta decay, Matrix elements, Allowed and forbidden transitions, Curie plots, Nuclear energy levels, Selection rule isomeric transitions, Internal conversion, Auger effect.	15 Hrs

Unit II:	Nuclear Structure and Stability Binding energy, Empirical mass equation, Nuclear models; liquid drop, Single particle shell, Fermi gas and collective/lunified nuclear models, Nuclear spin, Parity and magnetic moments of odd mass number nuclei, numerical problems.	15 Hrs
Unit III:	Nuclear Reactions and Nuclear Fission Introduction, Production of projectiles, Nuclear cross section, Nuclear dynamics, Threshold energy of nuclear reaction, Coulomb scattering, Potential barrier, Potential well, Formation of a compound nucleus, Nuclear reactions; direct nuclear reactions, heavy ion induced nuclear reactions and photonuclear reactions. Liquid drop model of fission, Fission barrier and threshold, Fission cross section, Mass energy and charge distribution of fission products, Symmetric and asymmetric fission, Decay chains and delayed neutrons.	15 Hrs
Unit IV:	Reactor Theory and Applications of Radioactivity Nuclear fission as a source of energy, Nuclear chain reacting systems, Critical size of a reaction, Research reactors; graphite moderated, enriched uranium, light water moderated, heterogeneous, aqueous homogeneous reactors and thermonuclear reactors, Gamma interactions, Shielding and health protection, Reactors in India, Tracer techniques; structure determination, elucidation of reaction mechanism, isotopic dilution analysis, neutron activation analysis, applications in biological, medical, industrial fields and age determination.	15 Hrs

Reference Books:

1. Friedlander, Kennedy and Miller, Nuclear and Radio Chemistry: John Wiley
2. B. G. Harvey, Nuclear Chemistry

3. Hassinsky: Translated by D. G. Tuck, Nuclear Chemistry and its application: Addison Wiley
4. B.G. Harvey, Introduction to Nuclear Physics and Chemistry
5. Maeclefort: Nuclear Chemistry: D. Van Nostrand
6. An N. Nesmeyannoy: Radiochemistry: Mir
7. Jacobs et al: Basic Principles of nuclear Science and Reactors, V. Nost & EWAP
8. N. Jay: Nuclear Power Today Tomorrow: ELBS
9. Kenneth: Nuclear Power Today, Tomorrow: ELBS
10. Essentials of Nuclear Chemistry, W. J. Arnikaar, John Wiley
11. Nuclear and Radiation Chemistry: B. K. Sharma, Krishna Publication 12
12. A Introduction to Nuclear Physics: R. Babber. And Puri.
13. Essential of Nuclear Chemistry by H. J. Arnikaar

**M. Sc. Part - II (Semester - III) Inorganic Chemistry Practical Course
ICHP-V and ICHP-VI (CC - 2105C)**

I] Non-Instrumental

A] Analysis of Ores and Alloys

1. **Ore Analysis** – Bauxite and Illeminite Ore
2. **Alloy Analysis** – Bronze and Stainless Steel alloy

B] Inorganic Preparations

1. Preparation of [tris-(acetyl-acetanato) ferrate III]
2. Preparation of [cobalt (II) 8-hydroxy quinoline]
3. Preparation of [cobalt (salicyladoxime)₂]
4. Synthesis of ZnO Nanoparticles
5. Synthesis of Nickel Ferrite

C] Percentage Purity

1. Determination of percentage purity of [tris-(acetyl-acetanato) ferrate III]
2. Determination of percentage purity of [cobalt (II) 8-hydroxy quinoline] 3.
Determination of percentage purity of [cobalt (salicyladoxime)₂]

II] Instrumental Experiments

A] Spectrophotometry

1. To study the spectra and determine extinction coefficient of potassium permagnate and potassium dichromate.
2. To determine the solubility contact of ferric ammonium sulphate and sulpho-salicylic acid by Job's variation method and slope ratio method and mole ratio method.
3. To determine the PKa value of Bromocresol indicator by using spectrophotometer.

B] pH metry

1. To determine the dissociation constant of orthophosphoric acid pH metrically.
2. To determine the pKa value of acetic acid pH metrically.

C] Conductometry

1. To determine the normality of acetic acid and hydrochloric acid conductometrically.

2. Analysis of Ibuprofen in given tablet by conductometrically.

D] Nephelometry

1. To determine sulphate content in water by nephelometrically.

2. To determine sulphate ion concentration in water by nephelometrically.

(Any other experiments may be added when required)

Reference Books:

1. A Text book of Quantitative Inorganic Analysis; A. I. Vogel

2. Practical inorganic chemistry; Pass Geoffrey and haydn Sutcliffe.

3. Advance Inorganic Analysis – S K Agarwala, KeemtiLal , Pragati Prakashan

4. Advanced Practical inorganic chemistry; Gurudeep Raj.

5. Experiments in Chemistry, D. V. Jahagirdar, Himalaya Publishing House

6. Systematic experimental physical chemistry – T. K. Chondhekar& S.W. Rajbhoj

7. Experiments in chemistry – D.V. Jahagirdar

8. Textbook of quantitative Inorganic Analysis – IV Edn. J. Bassett, R. C. Denny,
G.H.Gefery and J. Mendham

Vivekanand College (Autonomous), Kolhapur
M. Sc. Part - II (Inorganic Chemistry)
CBCS Syllabus with effect from June - 2022
Semester - IV

Paper XIII: Instrumental Techniques (CC - 2106D)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Understand and use various crystallographic databases. Process data, solve/refine and interpret a single crystal structure. Apply the concepts of unit cells and lattices to describe observed diffraction patterns in reciprocal space.
- CO2:** Acquire Knowledge of Nuclear Quadrupole Resonance and X-ray fluorescence spectroscopy and to apply to interpret data.
- CO3:** Understand the principal instrumentation and to apply for structural elucidation and investigation of compounds.
- CO4:** Understand ESR measurements, acquire information about the existence of unpaired electrons, as well as quantities, type, nature, environment and behaviour and to interpret structure.

Unit No.	Syllabus	No. of Lectures
Unit I:	X-ray Diffraction Techniques A] X-ray powder diffraction (XRD): X-ray source, Diffraction of X-rays with powder diffraction, Instrumentation, Use of standards, Identification of compounds using powder diffraction, Significance of intensities, Determination of cubic crystal structure, Determination of parameters using XRD: qualitative analysis; quantitative analysis-percent crystallinity, crystallite size, surface area, unit cell dimension.	10 Hrs
	B] Single Crystal X-ray Diffraction: Determination of single crystal structures, Refining of a structure, X-ray crystal structures in the literature.	5 Hrs

radical, Phenanthracene radical, Pyrene radical, Alkyl halide radicals, Quinone and Isoquinone anion radicals, nitrogen/deuterium containing radicals, Superhyperfine splitting, Instrumentation, 'g' value and factors affecting on 'g' value, Zero field splitting, Karmers's degeneracy, Applications, Numericals problems.
--

Reference Books:

1. Principles of Instrumental analysis, Skoog, IIIrd edn., Saunders, 1985
2. Mossbauer Spectroscopy, Greenwood N.N., Gibbs T.C., Chapman Hall, 1971.
3. Chemical Application of Mossbauer Spectroscopy, Goldanski V.I & Harber R.H., Academic Press 1968.
4. Mössbauer Spectroscopy and Transition Metal Chemistry, P. Gülich, R. Link, A. Trautwien, Springer-Verlag (1978).
5. Mössbauer Spectroscopy, N.N. Greenwood, T.C. Gibb, Chapman and Hall Ltd. (1971).
6. Instrumental method of analysis (7th edition) By- H.H. Willard, L.L. Merritt. Jr. J.A. Dean and F.A. Settle, Jr (Publisher: CBS Publishers and distributors Pvt .Ltd. (Copyright - wards worth publishing copy USA .2000).
7. Element of X-ray Diffraction - B.D. Cullity (1967)
8. CNR Rao Spectroscopy in Inorganic Chemistry Vol I, II, III
9. Powder Diffraction Theory and Practice, Edited by R E Dinnebier and S J L Billinge, RSC publishing, 2008.
10. In situ X-ray diffraction study of the hydrothermal crystallization of hierarchical Bi₂WO₆ nanostructures, Y. Zhou, et al., Nanoscale, 2010, 2, 2412-2417, RSC Publishing Journal.
11. Physical Methods for Chemists, Russel Drago, Surfside Scientific Publishers, 1992

Paper XIV: Co-ordination Chemistry-II (CC - 2107D)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

CO1: Explain lability and inertness of complexes and with respect to VBT and CFT.

CO2: Explain the kinetics and mechanism of substitution and electron transfer reactions in octahedral and square planar complexes.

CO3: Understands the classification of coordination polymers and learns the chemical background of individual polymers.

CO4: Know the applications of coordination compounds in industrial processes.

Unit No.	Syllabus	No. of Lectures
Unit I:	Inorganic Reaction Mechanism Types of mechanisms: Basic concepts, as stability and lability, stability constants; HSAB principle, chelate effect, macrocyclic effect, Ligand and electron transfer reactions in coordination compounds, Intimate and stoichiometric mechanism of ligand substitution. Substitution in square planar complexes: trans effect, trans series, applications of trans effect, Electron transfer reactions: Potential energy diagrams as a conceptual tool, Marcus equation, Types and factors affecting electron transfer reactions.	15 Hrs

Unit II:	Reaction Mechanism of Transition Metal Complexes Substitution reaction, Reactions of transition metal complexes, kinetics and mechanism of substitution reactions of octahedral complexes, Stereochemical aspects of substitution reaction of octahedral complexes: Stereochemical changes in dissociation (SN ²) and displacement (SN ²) mechanism through various geometries of coordination compounds, Isomerization and racemization reactions in octahedral complexes. Steric effects on substitutions.	15 Hrs
Unit III:	Coordination Polymers General introduction, Natural polymers, Synthesis of coordination polymers, Use of polymeric ligands in synthesis of coordination polymers, synthesis and uses of Metal coordination polymers, Silicon polymers and Organosilicon polymers.	15 Hrs
Unit IV:	Applications of Coordination Compounds General introduction, Metal complexes in Inorganic qualitative analysis, The 'brown ring' test, complexometric titrations, Complexes in colourimetry, Coordination compounds in gravimetry, Stabilization of oxidation states, Complexes in separation of metals. Metal complexes in medicinal chemistry and therapy: Complexation in food poisoning, Metal complexes in industrial processes:-Heavy metals-protein complexes in the Rasching Process, Metal complexes in alkene conversions, Complexes in Electroplating, Complexes in Metallurgy, Complexes in water softening, Metal complexes in Agriculture.	15 Hrs

Reference Books:

1. R. Gopalan and V. Ramlingam: Concise Coordination Chemistry.
2. J. E. Huheey, Ellen A. Keiter and Okhil K. Medhi: Inorganic Chemistry: Principle of Structure and Reactivity.
3. A.K. Das and M. Das, Fundamental Concepts of Inorganic Chemistry, Vol. 1 to Vol. 7, CBS Publishers.
4. F. Basolo and R. Pearsons: Mechanism of Inorganic Reactions: A Study of Metal Complexes in Solution.
5. Obe, M. L. Inorganic reaction mechanism, Nelson, London, 1972.
6. Taube, Electron transfer reactions of metal complex ions in solution. Academic Press.
7. E. S. Gould, Inorganic Chemistry.
8. K. Burger, Coordination Chemistry Experimental methods, Butterworths.
9. Heterogeneous catalysis 2nd edn. Bond C. Chapman all (1987).
10. The application & Chemistry of catalysis by suitable transition metal complexes Parashall. W. Weily N. 1980.
11. Homogeneous transition metal catalysis, A general art, Masters C. Chapman and Hall, London 1981.
12. Introduction to the principles of heterogeneous catalysis, Thomas J.M., Thomas W.J. Academic press N.Y. 1967.
13. K. M. Macky, R. A. Macky, Modern Inorganic Chemistry, 4th edn., Blackie, London 1989.
14. B. R. Puri, L. R. Sharma, K. C. Kalia, Principles of Inorganic Chemistry, Vallabh Publications, Delhi, 2005.

Paper XV: Energy and Environmental Chemistry (CC - 2108D)

Theory: 60hrs

Course Outcomes: After the completion of the course the student will be able to:

- CO1:** Understand the basic building blocks of various forms of energy and to know applications of fuel cells in various sectors, hydrogen production, storage, handling and safety issues.
- CO2:** Understand energy storage systems and to describe the parts in various Li-Ion Battery, materials and functionalities.
- CO3:** Explain the common principles, routes and processes in controlling the gaseous pollutants.
- CO4:** Understand meaning of important parameters for measuring water quality and understand the principles and the practical approaches and technique required to effectively monitor the chemical, hydrological and microbiological elements of water quality.

Unit No.	Syllabus	No. of Lectures
Unit I:	Energy Conversion Devices A] Fuel Cells: Working of Fuel Cell, Types of fuel cells, Uses, Fuel cell stacks and systems, Hydrogen fuel cell. B] Production of Hydrogen: Electrolysis, Thermochemical processes, Steam Reformer processes, Water gas process, Bosch process, Biosynthesis and photochemical processes, Coal Gasification, Steam Iron processes, Partial Oxidation processes, Storage, Transport and Handling of Hydrogen.	15 Hrs

Unit II:	Unit II: Energy Storage Devices (Batteries) Li ion Batteries: Principle of operation, Battery components and design, electrode material (LiCoO ₂ , LiNiO ₂ , LiNi _{1/3} Mn _{1/3} Co _{1/3} O ₂ , LiMn ₂ O ₄ , LiFePO ₄ , graphitic carbon) their synthesis and characterization, Theoretical capacity, Energy density, power density, cycle life, electrode and battery fabrication, battery modules and packs, Li- polymer batteries and applications, Electrolytes for Li-ion batteries, Other solid state batteries, Future developments and beyond lithium batteries: Li-S battery, Li-air battery, Advanced Lead - acid batteries, sodium batteries, Battery Recycling technologies.	15 Hrs
Unit III:	Air Pollution and Control Methods Introduction, Source Correction Methods; substitution of raw materials, process modification, existing equipment modification, maintenance of equipment, Control of Particulate emissions, Selection of a particulate collector, Control of gaseous pollutants, NO _x and SO _x , Removal of H ₂ S, Control of CO-pollution, Control of hydrocarbon emission, Control of pollutant emission from mobile sources.	15 Hrs
Unit IV:	Water Pollution and Monitoring Control Methods A] Sewage and industrial wastes, COD and BOD, Estimation methods, Toxic heavy metal Analysis of Cd, Hg, As, Pb and Cr metals, Control Methods: Water softening and Municipal water purification B] Techniques in environmental analysis - ND-IR , FT- IR, AAS, ICT- AES, GCMS, HPLC, Anodic Stripping, Voltametry etc.	15 Hrs

References Books:

1. Fuel Cell Fundamentals, R.O. Hayre, et.al., John Wiley and Sons, 2016
2. Environmental Pollution, A.K. De
3. Environmental Pollution Analysis, S. M. Khopkar
4. Lithium Ion Batteries Materials, Technology and new Applications, K.Ozawa, Wiley.
5. Electronic Waste Magement. , Ed. Ramchandra, CRC Press 2015 1st edition.

Paper XVI (A): Inorganic Nanomaterials (CC - 2109D)

Theory: 60 hrs

Course Outcomes: After the completion of the course the student will be able to:

CO1: Understand synthesis approaches of nanomaterials and challenges in Nano Technology.

CO2: Describe different characterization techniques of materials, outline the principles on which they are based, and explain their limitations.

CO3: Understand the technological application of nanomaterial is usable in multiple sectors, from healthcare and mechanics to environmental preservation and air purification.

CO4: Acquire knowledge about the toxicity in Nanoscience, and their effects on Human as well as to learn various concepts of toxicity, and its effects.

Unit No.	Syllabus	No. of Lectures
Unit I:	Advanced Synthetic Methods of Inorganic Nanomaterials General Introduction to Nanomaterials, Nanoscience and nanotechnology, History, Chemical bath deposition: ionic and solubility products, preparation of binary semiconductors, Electrodeposition: Deposition mechanism and preparation of compound thin film, successive ionic layer adsorption reaction method (SILAR), Co-precipitation, Micelles-microemulsions, Reduction method.	15 Hrs

Unit II:	<p>Characterization Techniques for Inorganic Nanomaterials</p> <p>A] Principle and applications of X-Ray diffraction: Index reflections, Identifications of unit cell from systematic absences in diffraction pattern, Structure of simple lattices and X-Ray intensities.</p> <p>B] Principle instrumentation and application of electron spectroscopy for chemical analysis (ESCA), transmission electron microscopy (TEM), HRTEM, Scanning electron microscopy (SEM), FESEM, EDAX, Probe Microscopy (STM & AFM), UV-Visible-NIR spectroscopy (optical microscopy), FTIR, BET, surface profiler, Electro chemical work station.</p>	15 Hrs
Unit III:	<p>Applications of Nanomaterials</p> <p>Carbon nanomaterials, Nanocomposites including metal nanomaterials such as single particle as well as coreshell nanomaterials, Fuel cell, Solar cell, Medicinal applications, Agro-food applications, Polymer Nanotechnology, Organic electronics, Nanotribology and Nanobiotechnology.</p>	15 Hrs
Unit IV:	<p>Nanotoxicity and Biosafety</p> <p>Introduction to Nanotoxicology, Nanoetymology, Nanotoxicology challenges, Physicochemical characteristic dependent toxicology, Epidemiological evidences, Mechanism of nanotoxicity, Assessment of nanomaterial toxicity: In vitro toxicity assessment-cell viability and in vivo toxicity assessment.</p>	15 Hrs

Reference Books:

1. The Chemistry of Nanomaterials edited by C.N.R. Rao, A. Muller, A.K. Cheetham
Wiley VCH Verlag GmbH & co. Volumes 1 & 2.
2. Nanomaterials by Dr. Sulbha Kulkarni.
3. T. Pradeep, "A Textbook of Nanoscience and Nanotechnology", Tata McGraw Hill Education Pvt. Ltd., 2012

4. Hari Singh Nalwa, "Nanostructured Materials and Nanotechnology", Academic Press, 2008
5. Handbook of Nanotoxicology, Nanomedicine and Stem Cell Use in Toxicology. Saura C Sahu, Daniel A Casciano
6. Nanomaterials and Nanochemistry, 2007, Catherine Brechignac, Philippe Houdy, Marcel Lahmani, ISBN 978-3-540-72992-1 Springer Berlin Heidelberg New York.
7. Nanomaterials Chemistry, Recent Developments and New Directions C.N.R. Rao, A. Muller, and A.K. Cheetham, ISBN 978-3-527-31664-9, 2007 WILEY-VCH Verlag GmbH and Co. KGaA, Weinheim.
8. Nano-Surface Chemistry, 2001, Morton Rosoff, ISBN: 0-8247-0254-9, Marcel Dekker Inc. New York.
9. Principles of Instrumentals Analysis: D. Skoog & West

Paper XVI (B): Radiation Chemistry (CC - 2110D)

Theory: 60hrs

Unit No.	Syllabus	No. of Lectures
Unit I:	Isotopes and Biological effects of Radiation	
	A] Isotopes: Introduction, Difference between Isotopes and Isobars, Isotope separation, Thermodynamic and kinetic isotope effects, Isotope exchange reaction kinetics, Determination of exchange rate constant, Production and applications of radio isotopes.	8 Hrs
	B] Biological effects of Radiation: Introduction, Genetic and somatic effect on human being, Effect of radiation on plants and aquatic environment.	7 Hrs
Unit II:	Radiochemical Separation The need of radiochemical separation techniques, Carrier techniques, Isotope and nonisotopic carriers, Coprecipitation and adsorption, Ion exchange, Solvent extraction, Electrolytes behavior of carrier free tracer radionuclide.	15 Hrs
Unit III:	Principle of Tracer Chemistry Introduction to tracers, application of tracers in physiochemical studies, Diffusion studies, Isotopic and exchange reactions, Tracer in the study of the mechanism of the inorganic chemical reactions, atom transfer and electron transfer mechanisms. Heterogeneous catalysis and surface area measurements, radio carbon dating, tracer studies with tritium, applications in metallurgy and preservation of food, geochemical applications and hot atom chemistry.	15 Hrs
Unit IV:	Radiation Detection and Measurements Ionization current measurements, multiplicative ion collector,	15 Hrs

methods not based on ion collection, auxiliary instrumentation and health physical instruments and counting statistics, Working of Scintillation and Geiger Muller Counter.	
---	--

Reference Books:

1. Friedlander, Kennedy and Miller, Nuclear and radio Chemistry, ohm Wiley.
2. B.G. Harvey, Nuclear Chemistry.
3. Haissinsky, Translated by D.G, Tuck, Nuclear physics and Chemistry.
4. Mark lefort, Nuclear Chemistry, D.V. Nostrand.
5. An N. Nesmeyanov, Radiochemistry, Mir.
6. Jacobs, et al, Basic Principles of nuclear science and reactors, V. Nost, EW AP.
7. N. Jay, Nuclear power, today tomorrow, ELBS.
8. Kenneth, Nuclear power, today and tomorrow, ELBS.
9. Essentials of Nuclear Chemistry, J. Arnikar, John Wiley.
10. D.C. Dayal, nuclear physics.

M. Sc. Part - II (Semester - IV) Inorganic Chemistry Practical Course

ICHP - VII and ICHP - VIII (CC - 2111D)

Practical courses include Submission of project work.

I] Non-Instrumental Experiments

A] Analysis of Ores, Alloys and Cement

1. Ore Analysis – Galena Ore
 2. Alloy Analysis – Fernico and Nichrome alloy
 3. Cement Analysis
- ##### B] Inorganic Preparations
1. Preparation of [trans Bis-(ethylene diammine) dichloro cobaltic] chloride
 2. Preparation of [dinito tetra amino cobaltic] sulphate
 3. Preparation of [copper (salicyladoxime)₂]

II] Instrumental Experiments

A] pH metry

1. To study the titration of HCl Vs NaOH pH metrically.
2. To study the titration of mixture of H₂SO₄ and CH₃COOH Vs NaOH pH metrically.

B] Conductometry

1. To determine the normality of sulphuric acid and nitric acid by conductometrically.
2. To study the titration of aluminium Potassium Sulphate and NaOH by conductometrically.

Reference Books:

1. A Text book of Quantitative Inorganic Analysis; A. I. Vogel
2. Practical inorganic chemistry; Pass Geoffrey and haydn Sutcliffe.
3. Advance Inorganic Analysis – S K Agarwala, KeemtiLal , Pragati Prakashan
4. Advanced Practical inorganic chemistry; Gurudeep Raj.
5. Experiments in Chemistry, D. V. Jahagirdar, Himalaya Publishing House
6. Systematic experimental physical chemistry – T. K. Chondhekar& S.W. Rajbhoj
7. Experiments in chemistry – D.V. Jahagirdar

8. Textbook of quantitative Inorganic Analysis – IV Edn. J. Bassett, R. C. Denny, G.H. Geferly and J. Mendham

- **Project/Industrial Training:** A variety of small projects designed by teachers based on the student's interest and capabilities should be worked out.

OR

- The students can also complete the industrial training for minimum 15 days and submit the report to the department.
- Project work or the review report or the industrial training report of 50 marks will be examined by internal and external examiners.
- Addition of other experiments in place of existing one may be allowed.
- Study tour is compulsory for M.Sc. Part- II students to visit chemical industries in India.

Scheme of teaching and examination

- The semester examination will be conducted at the end of each term (both theory and practical examination)
- Theory paper will be of 80 marks each and 20 marks for internal evaluation test conducted in the mid of the term. Two practicals will be of 100 marks each.
- Question papers will be set in the view of the entire syllabus and preferably covering each unit of the syllabus.

Nature of Question Paper and Scheme of Marking

1. There shall be 7 questions carrying 16 marks each.
2. Question No. 1 is compulsory. It consists of fill in the banks, objective or answer in one sentence type questions.
3. The remaining question No. 2 to 7 are divided into two sections (Section I and II).
4. Section I consists of question No 2, 3 and 4.
5. Section II consists of question No 5, 6 and 7.
6. Questions 2 to 6 consists of 2 or 3 sub questions.
7. Question No 7 consists of sub questions in which students have to write short notes on any three or four sub questions among the given options.

Nature of Question Paper

M.Sc. (Part-I/II) Semester-I/II/III/IV (CBCS) Examination

Name of the Paper (Paper No.....)

Sub. Code:

Day & Date: _____

Time: _____

Total Marks: 80

-
- Instructions:*
- 1) Question one is compulsory.
 - 2) Attempt any 'TWO' questions from each section.
 - 3) All questions carry equal marks.
 - 4) Figures to the right indicate full marks.
 - 5) Neat and labelled diagram should be drawn wherever necessary.

Q. 1) Answer the following. (One mark each) [16]

SECTION-I

- Q. 2) i. [8]
ii. [4]
iii. [4]

- Q. 3) i. [8]
ii. [4]
iii. [4]

- Q. 4) i. [8]
ii. [4]
iii. [4]

SECTION-II

- Q. 5) i. [8]
ii. [4]
iii. [4]

- Q. 6) i. [8]
ii. [8]

Q.7)

Write a note on. (any four)

[16]

i.

ii.

iii.

iv.

v.

vi.

Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur
(Empowered Autonomous)**



DEPARTMENT OF CHEMISTRY

**M. Sc. Part - II Analytical Chemistry
Semester-III & IV**

SYLLABUS

Under Choice Based Credit System

to be implemented from Academic Year 2023-24

Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Chemistry
M. Sc. Part-II, (Sem III and IV)
Analytical Chemistry Syllabus (CBCS) 2023-24

Total No. of Semester – 02

Total No. of Papers – 08

No. of papers (theory) per semester – 04

No. of practical course per semester – 02

Maximum marks per paper (practical) -100

Distribution of Marks – Internal evaluation - 20

External evaluation - 80

(Semester exam.)

Total Marks for M. Sc. Degree

Theory Paper: 1600

Practical course: 800

Total: 2400

Course Structure

Sr. No.	Paper No.	Course code	Course Name	Teaching Scheme		Examination Scheme and Marks				Course Credits
				TH	PR	ESE	CI E	PR	Marks	
Semester-III										
COMPULSORY COURSE										
1	IX	CC - 2200C	Advanced Analytical Techniques	4	-	80	20	-	100	4
2	X	CC - 2201C	Organo Analytical Chemistry	4	-	80	20	-	100	4
3	XI	CC - 2202C	Electroanalytical Techniques in Chemical Analysis	4	-	80	20	-	100	4
ELECTIVE PAPERS										
4	XII(A)	CC - 2203C	Environmental Chemical Analysis and Control	4	-	80	20	-	100	4

5	XII(B)	CC - 2204C	Recent Advances in Analytical Chemistry	4	-	80	20	-	100	4
6		CC - 2205C	Practical Course: V	4	-	-	-	100	100	4
7		CC - 2205C	Practical Course: VI	4	-	-	-	100	100	4
				16	08	320	80	200	600	24
Semester-IV										
COMPULSORY COURSE										
1	XIII	CC - 2206D	Modern Separation Method in Analysis	4	-	80	20	-	100	4
2	XIV	CC - 2207D	Organic Industrial Analysis	4	-	80	20	-	100	4
3	XV	CC - 2208D	Advanced Methods in Chemical Analysis	4	-	80	20	-	100	4
ELECTIVE PAPERS										
4	XVI(A)	CC - 2209D	Industrial Analytical Chemistry	4	-	80	20	-	100	4
5	XVI(B)	CC - 2210D	Quality Assurance and Accreditation	4	-	80	20	-	100	4
6		CC - 2211D	Practical Course: VII	4	-	-	-	100	100	4
7		CC - 2212D	Practical Course: VIII	4	-	-	-	100	100	4
				16	08	320	80	200	600	24
Total (Sem. III & IV)				32	16	640	160	400	1200	48

Vivekanand College, Kolhapur (Empowered Autonomous)
M. Sc. Part - II (Analytical Chemistry)
CBCS Syllabus with effect from June - 2023
Semester - III
Paper No. - IX: Advanced Analytical Techniques (CC - 2200C)
Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Learn mass spectrometry by outlining its principles, historical context, compound-based classification, ionization techniques, and diverse mass analyser comparisons.
- CO2:** Understand the importance of nanomaterials and nanotechnology, distinguish between diverse nanomaterial dimensions, elucidate synthesis methods with examples, and evaluate application areas across fields.
- CO3:** Attain expertise in advanced microscopy techniques by comprehending working principles, recognizing practical applications, and distinguishing between methods based on strengths and limitations.
- CO4:** Gain comprehensive proficiency in a spectrum of spectroscopic techniques, encompassing principles, instrumentation, data analysis and practical applications.

Unit No.	Syllabus	No. of Lectures
Unit I:	Advances in Mass Spectrometry Introduction to Mass spectrometry, diagram of a mass spectrometer and Instrumentation, principles, history, concept of ion free path, classification of mass spectrometry based on nature of compound to be analyzed and the ion sources viz. Electron impact (EI), chemical ionization (CI), Fast ion or atom bombardment ionization (FID/FAB), field desorption (FD), laser desorption ionization (LDI), plasma desorption ionization (PDI), thermospray ionization (TSI), electrospray (ESI), atmospheric pressure ionization, Inductively couple plasma (ICP) etc. Mass Analyzers, Quadrupolar Analyzers,	15 Hrs

	<p>Quadrupole ion trap or Quistor, Ion trap detector, development of high -Mass, High-resolution ion trap, tandem mass spectrometry in the ion trap, time of flight analyzer, magnetic and electromagnetic analyzer, ion cyclotron resonance and FT- MS, and detectors.</p>	
Unit II:	<p>Introduction to Nanotechnology and Nano Chemistry Definition of nanomaterials and nanotechnology, significance of nanotechnology, size and properties, types of nanomaterials like 0D (quantum dots), 1D, 2D and 3D, introduction to physical, chemical and biological synthesis of nanomaterials with suitable examples, top down and bottom-up approach, chemical synthesis of nanomaterials - Different types and processes for synthesis of nanomaterials using wet chemical approaches. Fabricating nanomaterials with different morphology intended for specific applications, Applications of Nanotechnology.</p>	15 Hrs
Unit III:	<p>Advanced Instrumentation Techniques-A Scanning Electron Microscope (SEM) - Introduction, principle, instrumentation, applications Transmission Electron Microscope (TEM) - Introduction, principle, instrumentation, applications Electron Dispersion Spectroscopy (EDS) - Introduction, principle, instrumentation, applications Energy Dispersive X-ray Analysis (EDAX) - Introduction, principle, instrumentation, applications Scanning Tunneling Microscopy (STM) - Introduction, principle, instrumentation, applications Atomic Force Microscopy (AFM) - Introduction, principle, instrumentation, applications Practical applications and examples in analytical chemistry and research.</p>	15 Hrs

Unit IV:	<p>Advanced Instrumentation Techniques-B</p> <p>Raman Spectroscopy- Introduction, principle, instrumentation, applications</p> <p>X-Ray Fluorescence Spectroscopy (XFS) - Introduction, principle, instrumentation, applications</p> <p>Electron Spin Resonance Spectroscopy (ESR)- Introduction, principle, instrumentation, applications</p> <p>X-Ray Photoelectron Spectroscopy (XPS)- Introduction, principle, instrumentation, applications</p> <p>Auger Electron Spectroscopy - Introduction, principle, instrumentation, applications</p> <p>Secondary Ion Mass Spectrometry (SIMS)- Introduction, principle, instrumentation, applications</p> <p>Practical applications and examples in analytical chemistry and research.</p>	15 Hrs
-----------------	--	---------------

Recommended Books:

- 1) E. De. Hoffmann, J. Charette, V. Stroobant, Mass Spectroscopy: Principles and Applications, John Wiley & Sons, Masson, Paris 1996.
- 2) J. H. Gross, Mass Spectroscopy: A Text book, Springer-Verlag Berlin 2004.
- 3) C. G. Herbert, R. A. W. Johnstone, Mass Spectrometry Basics, CRC Press, Boca Raton, Florida, 2002.
- 4) K. Benjamin : Mass Spectrometry
- 5) A. I. Vogel: A text book of Quantitative inorganic Analysis, Lonqmans.
- 6) G. H. Morrison and H, Freiser : Solvent Extraction in Analytical Chemistry (John Wiley New York, 1958)
- 7) Willard, Merrit and Settle: Instrumental Methods of analysis.
- 8) Principles of instrumental analysis- Holler, Skoog and Crouch
- 9) Instrumental methods of Chemical analysis - H. Kaur
- 10) Bhushan, Bharat 2004. Handbook of Nanotechnology. Springer.
- 11) Niemeyer, C.M. & Mirkin, C.A. 2004. Nanobiotechnology- Concepts, Applications and Prespectives. Wiley-VCH Verlag.

- 12) Zander, C., Enderlein, J. & Keller, R.A. 2002 Single Molecule Detection in Solution. Wiley- VCH Verlag.
- 13) Avouris, P, Klitzing, K. Von, Sakaki, H. & Wiesendanger, R.2003 NanoScience and Technology.
- 14) Series. Scanning Probe Microscopy- Analytical Methods (R. Wiesendanger eds), Springer.
- 15) Instrumental Analysis by Skoog
- 16) Nanochemistry, a chemical approach to nanomaterials, G. A. Ozin, and A. C. Arsenault, RSC Publishing, Cambridge, 2005. ISBN 0-85404-664-X.

Paper No. - X: Organo Analytical Chemistry (CC - 2201C)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Develop a profound grasp of UV-Visible, IR, ¹H-NMR, ¹³C NMR, and Mass Spectrometry, encompassing fundamental principles, advanced organic analysis, and the ability to solve intricate structural determination challenges.
- CO2:** Proficiently classify drugs, pinpoint potential impurity sources in pharmaceutical raw materials, execute limit tests for Pb, As, Fe, and utilize a range of analytical techniques, including UV, colorimetric, and biological assays, for the comprehensive analysis of drugs and vitamins.
- CO3:** Gain a comprehensive knowledge of clinical analysis and enzyme assay techniques, showcase adeptness in collecting, preserving, and analysing physiological fluids, conduct estimations of key constituents in blood and urine samples, and effectively employ analytical methods for diagnosing diseases.
- CO4:** Engage in a comprehensive exploration of pesticide introduction, classification, and analysis, utilizing colorimetric and chromatographic techniques like GC-MS, HPLC-MS to examine pesticide residues, and the estimation of toxic substances such as lead, mercury, arsenic in biological samples for forensic applications.

Unit No.	Syllabus	No. of Lectures
Unit I:	Hyphenated Techniques Advanced techniques of analysis: UV-Visible, IR, ¹ H-NMR (Recapitulation), ¹³ CNMR, Mass spectrometry (Basic fundamentals of mass spectrometry, ionization, advanced organic analysis examples); Problems related to structure determination and applications of spectroscopic techniques as analytical tools.	15 Hrs

- 7) V. M. Parikh: Absorption spectroscopy of organic molecules (Addision Wesley)
- 8) Willard, Merrite, Dean and Settle: Instrumental methods of analysis (CBS)
- 9) D. H. Williams and J. Fleming: Specroscopic methods in organic chemistry (Mc Graw Hill)
- 10) Silverstein: Spectroscopic Identification of organic compounds (John Wiley)
- 11) Jackmann and Sternhill: Applications of NMR spectroscopy of organic Chemistry (Pergamon Press)
- 12) J. D. Roberts : Nuclear Magnetic Resonance (Mc Graw Hill)
- 13) K. Benjamin : Mass Spectrometry
- 14) Nichollas: Aids to the Analysis of foods and Drugs.
- 15) A. H. Beckett and J. B. Stanlake; Practical Pharmaceutical Chemistry Vol. I & II (CBS publishers)
- 16) S. Ranganna: Handbook of analysis and quality control for fruits and vegetable products (McGraw Hill)
- 17) Ramalu: Analysis of pesticides

Paper No. - XI: Electroanalytical Techniques in Chemical Analysis (CC-2202C)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Develop a comprehensive comprehension of voltammetry principles, encompassing cyclic voltammetry, pulse voltammetry, and stripping voltammetry, for analyte determination and showcasing their real-world applications in analytical chemistry and research.
- CO2:** Understand the classification, properties, theories of charge origin, stability, factors influencing coagulation and spontaneous ageing of colloids, as well as differentiate types of emulsions, elucidating their preparation, properties, and demulsification methods.
- CO3:** Attain a thorough understanding of particle size analysis methodologies such as LASER light scattering, dynamic light scattering, and photosedimentation, including theoretical models like Mie theory and Fraunhofer diffraction theory and to apply diverse techniques like XRD, SEM, and TEM for real-world particle size measurements.
- CO4:** Explain different ion-selective electrode types, encompassing glass, solid-state, liquid-liquid membrane, enzyme, and gas electrodes, detailing their construction and applications.

Unit No.	Syllabus	No. of Lectures
Unit I:	Voltammetry Techniques Introduction, Principle, excitation signals in voltammetry, basic instrumentation based on operational amplifiers, voltammetric electrodes Cyclic Voltammetry: Instrumentation, Determination of analytes using cyclic voltammetry, Applications. Pulse voltammetry: Introduction, Normal Pulse Voltammetry, Reverse pulse voltammetry, Differential pulse voltammetry, Square wave voltammetry. Stripping voltammetry: Cathodic and Anodic stripping	15 Hrs

	voltammetry, Electrodeposition step, Voltammetric completion of the analysis, adsorptive stripping methods, voltammetry with microelectrodes. Practical applications in analytical chemistry and research.	
Unit II:	<p>a) Ion selective electrodes & Electrochemical sensors: Introduction, types and construction of electrodes, glass electrode, solid state and precipitate electrodes, liquid – liquid membrane electrodes, enzyme and gas electrodes, Chemically modified electrode, Enzyme based electrode, catalytic electrodes, ultramicroelectrodes and applications.</p> <p>b) Electrogravimetry Introduction, Types of electrogravimetric techniques, Diffusion Migration, Convection, instrumentations, applications.</p>	15 Hrs
Unit III:	<p>Particle Size Analysis Introduction, Low angle LASER light scattering: Instrumentation, theoretical models, Mie theory, Fraunhofer diffraction theory, particle size distribution analysis, Applications. Dynamic Light Scattering: Introduction, Instrumentation, photodetector sample cell and sample handling, Applications, Photosedimentation: Settling velocity and particle size, Stokes equation, Instrumentation, sedimentation modes, Particle size distribution analysis, photometric measurements and applications. Comparison with particle size measurements using XRD, SEM and TEM. Practical applications in analytical chemistry and research.</p>	15 Hrs
Unit IV:	<p>Electrophoresis: Introduction, Paper electrophoresis Principle, Factors governing migration of ions, Supporting media (gel, paper,</p>	15 Hrs

	cellulose, acetate, starch, polyacrylamide, agarose, sephedax and thin layers) Techniques of electrophoresis: Low and high voltage, iso electric focusing, continuous electrophoresis, capillary electrophoresis, Zone, gel, isotaechophoresis and miceller electro kinetic capillary chromatography, instrumentation, detection and applications and Applications, Numericals.	
--	---	--

Reference Books:

- 1) R.D. Braun, Introduction to Instrumental Analysis.
- 2) D.A. Skoog, F. J. Holler, Principles of Instrumental Analysis, 6th edition.
- 3) Willard, Deritt, Dean and Settle, Instrumental methods of Analysis.
- 4) F. J. Welcher, Standard Methods of chemical Analysis Vol.3, Part A & B.
- 5) G.W. Ewing, Instrumental Methods of Analysis 4th and 5th editions.
- 6) Chatawal and Anand, Instrumental Methods of Analysis.
- 7) Bassett, Denney-Jeffer and Mendham, Vogel's Textbook of Quantitative Inorganic Analysis, (5th edition).
- 8) Electro-analytical chemistry, edited by H.W. Nurnberg.
- 9) Stulic, Ion selective electrodes (John Wiley).
- 10) Introduction to instrumental analysis by R. D. Broun, Mc Graw Hill (1987)
- 11) Instrumental methods of chemical analysis by H. Willard, D. Merrit, J.A. Dean and F.A. Settle. Sixth edition CBS (1986)
- 12) Fundamentals of Analytical Chemistry by D. A. Skoog, D. M. West and H. J. Holler sixth edition (1992) and Principles of Instrumental Analysis Skoog, West, Niemann
- 13) Vogel Text Book of quantitative analysis 6th Ed.

Elective Papers

Paper No. - XII (A): Environmental Chemical Analysis and Control (CC - 2203C)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to

- CO1:** Develop a comprehensive grasp of sampling theory, techniques, and criteria for gases, liquids, and solids; implement strategies to minimize variables during sampling and ensure efficient transmission and storage of collected samples.
- CO2:** Acquire expertise in performing comprehensive environmental analyses through a range of electrochemical techniques, including conductometry, potentiometry, cyclic voltammetry, amperometry, and coulometry, fluorescence spectrometry, inductively coupled plasma spectrometry, turbidimetry, and non-dispersive infrared analysis (NDIR) for diverse environmental applications.
- CO3:** Develop a comprehensive understanding of the chemistry, sources, characterization, and analysis methods for air pollutants, major minor components in potable and industrial water, conducting measurements for parameters including DO, COD, and BOD; and perform in-depth analyses of pollutants such as Pd, Cd, Hg, Cr, As in water, including quality assessments of organic and inorganic constituents in industrial wastewater.
- CO4:** Grasp the lifecycle of phenolic residues, including their sources, disposal, treatment, and analysis, with a focus on recovery methods from liquid effluents; adeptly conduct analysis of organomercurials, organochlorine pesticides, and volatile organic pollutants, employing suitable analytical methods.

Unit No.	Syllabus	No. of Lectures
Unit I:	Sampling in analysis Definition, theory and techniques of sampling, sampling of gas, liquids and solids, Criteria of Good sampling, Minimization of Variables, transmission and storage of samples, high pressure ashing techniques (HPAT),	15 Hrs

	particulate matter, its separation in gas stream, Filtering and gravity separation. Analysis of particulate matter like asbestos, mica, dust and aerosols etc.	
Unit II:	Electrochemical and spectral methods Environmental analysis Introduction to instrumental techniques, principle instrumentation and applications with respect to environmental analysis of Conductometry, Potentiometry, Ion selective electrodes, Amperometry, Coulometry, Atomic absorption spectrometry, Atomic fluorescence spectrometry, Inductively coupled plasma spectrometry, Turbidimetry, Non Dispersive Infrared Analysis (NDIR).	15 Hrs
Unit III:	Air and Water Pollutant Analysis Chemistry of Air pollutants, characterization. source, methods of analysis of air pollutants; CO, CO ₂ , NO _x , NH ₃ , H ₂ S, SO ₂ etc. Monitoring Instruments, Potable and Industrial water, major and minor components, dissolved oxygen (DO) Chemical oxygen demand(COD) Biochemical oxygen demand (BOD) and their measurements. Analysis of Pd, Cd, Hg, Cr, As and their physiological manifestations. Quality of industrial waste water analysis for organic and inorganic constituents. Chemistry of odour and its measurements.	15 Hrs
Unit IV:	Organic Pollutants and Their Analysis Sources, disposal, treatment and analysis of phenolic residues, methods of recovery of phenols from liquid effluents, Organomercurials and its analysis, Analysis of organochlorine pesticides, volatile organic pollutants and their analysis	15 Hrs

Recommended books:

- 1) A.K. De: Standard Methods of Waste and Waste water analysis.

- 2) P. M. S. Monk Fundamentals of Electroanalytical chemistry-John Wiley & Sons (2001)
- 3) Instrumental methods of chemical analysis H. Kaur
- 3) S.M. Khopkar, Environmental Chemistry ; Environmental pollution analysis
- 4) M.S. Creos and Morr, Environmental Chemical Analysis, American publication (1988)
- 5) A.K. De, Environmental Chemistry, New Age International publishers. Moghe and Ramteke, Water and waste water analysis: (NEERI)
- 6) A.C. Stern, Air pollution: Engineering control Vol. IV(AP)
- 7) P.N. Cheremisinoff and R.A. Young, Air Pollution control and Design. Hand Book Vol. I & II (Dekker)
- 8) R.B. Pohasek, Toxic and Hazardous waste disposal, Vol.I& II (AAS)
- 9) M.Sitting, Resources Recovery and Recycling, Handbook of industrial Waste.
- 10) B.K.Sharma, Industrial Chemistry.
- 11) S.P. Mahajan, Pollution Control in Process Industries.
- 12) R.A. Horne, Chemistry of our Environment.

Paper No. - XII (B): Recent Advances in Analytical Chemistry (CC - 2204C)

Theory: 60hrs

Unit No.	Syllabus	No. of Lectures
Unit I:	Ultra Purity and Ultra trace Analysis Ultra purity and ultra trace analysis, laboratory dosing, purification of reagents, Preconcentration Techniques, Methods of trace analysis such as NAA, XRF, AAS and ICP, High purity materials for electronic industry, contamination control during analytical operations.	15 Hrs
Unit II:	Radio-analytical Chemistry Separation methods, Precipitation, solvent extraction and chromatographic methods. Activation analysis, basic principles, fast neutron activation analysis, radiochemical methods in activation analysis, Applications if Geo-chemistry, oxygen in metals. Isotope dilution analysis: Principles and applications. Sub-stoichiometric determination of traces of metals: Principles, techniques and experimental methods in the determination of As, Pb and Hg.	15 Hrs
Unit III:	Advanced Techniques in Analysis Nuclear Magnetic Resonance Spectroscopy (^1H NMR): Elementary ideas (Recapitulation); Different types of couplings, factors affecting on coupling constants, Karplus equation, Spin systems (AB, AX, ABX, AMX), Rate processes, spin decoupling, shift reagents, Nuclear Overhauser effect (NOE), INEPT and INADEQUATE. ^{13}C Nuclear Magnetic Resonance Spectroscopy Elementary ideas, instrumental problems, chemical shifts (aliphatic, olefinic, alkyne, aromatic, heteroaromatic and carbonyl carbons); Effect of substituents on chemical shifts.	15 Hrs

Unit IV:	Electron Spin Resonance Spectroscopy Electron behavior, ESR spectrometer, Spectra, Hyperfine interaction, free radical and interpretation of the spectra, Applications in quantitative analysis. Numerical problems.	15 Hrs

Recommended books:

- 1) Garen W. Ewing, Analytical Instrumentation, Handbook, Marcel Dekker Inc. (1997).
- 2) Mereitt, Dean, Settel, Instrumental methods of Chemical Analysis.
- 3) M. Zeif and J.W.Mitchell, Contamination Control in trace elemental analysis.
- 4) Ajuja, Ultrapurity.
- 5) Minczewski, Chwastowska and Dycozynski, Separation and pre-concentration methods in Inorganic trace analysis. Ellis Haward.
- 6) Cali, trace Analysis of semiconductor Materials Pergamon.
- 7) Overman and Cleark, Radioisotopes techniques MGH.
- 8) Tolgyessy, Brown and Kyr, Isotope dilution analysis.
- 9) Leniham and Thomson, Activation Analysis(AP)
- 10) Ruzica and Sary, Substopchiometry in Radiochemical Analysis. Pergamon.
- 11) Ladd and Lee, Radiochemistry.
- 12) Clerk, Handbook of Radiochemical methods
- 13) Price, Nuclear radiation detections.

M. Sc. Part - II (Semester - III) Analytical Chemistry
Practical Course -V and VI (CC - 2205C and CC - 2206C)

List of Experiments:

Major:

1. Estimation of Sn, Zn, Cu and Pb from Bronze alloy (volumetric, gravimetric or colorimetric techniques can be used)
2. Estimation of Ca and Fe from milk powder
3. Analysis of Galena ore
4. Analysis of Benzoic acid and salicylic acid from medicated powder
5. Analysis of vitamin A in food products
6. Estimation of Aspirin
7. Kjeldahl's method of protein estimation in foods and feeds
8. Analysis of Lindane in BHC powder.
9. Determination of pK value of an indicator.
10. Polarographic estimation of traces of Cu, Cd, Ni, Zn and Fe in sample solution.
11. To study the complex formation between Fe(III) and salicylic acid and determine the stability constants of the complex by Job's variation method.
12. To determine the equivalence conductance and dissociation constant using Kohlrausch Law at infinite dilution independent of ionic mobility of weak electrolyte.
13. Any other suitable experiment may be added when required.

Minor:

1. Analysis of plaster of Paris for calcium content
2. Fertilizer analysis for P (colorimetrically), K (Flame photometrically).
3. Determination of Barium ions by Turbidimetry.
4. Analysis of iodized table salt.
5. Analysis of soda ash.
6. Estimation of copper fungicide
7. Analysis of sulphur drug
8. Analysis of vitamin-C in juices and squashes.

9. Analysis of ethambutol
10. Identification of organic compounds by their IR spectra
11. Determination of strength of acetic acid in commercial vinegar by conductometric method.
12. Determination of chloride content from saline water by potentiometry.
13. Estimation of bicarbonate and carbonate by potentiometric method.
14. Estimation of Fe by ceric sulphate and potassium dichromate titration potentiometrically.
15. XRD and Thermal analysis Kaolinite, cobalt oxalate and zinc oxalate.
16. Estimation of vitamin B2 in the medicinal tablets fluorimetrically.
17. Kinetic study of hydrolysis of ethyl acetate in presence of OH⁻ ions conductometrically.
18. Determination of pK of given dibasic acid pH-metrically.
19. Determination of relative strength of acetic acid, chloroacetic acid and trichloro acetic acid by conductometrically.

(At least 10 major and 10 minor experiments should be carried out)

Vivekanand College, Kolhapur (Empowered Autonomous)
M. Sc. Part - II (Analytical Chemistry)
CBCS Syllabus with effect from June - 2023

Semester - IV

Paper No. - XIII: Modern Separation Methods in Analysis (CC - 2206D)
Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Understand the advanced gas and liquid chromatographic techniques. They will be well-versed in the principles, instrumentation, working mechanisms.
- CO2:** Utilize hyphenated techniques, such as gas chromatography-mass spectrometry (GC-MS) and liquid chromatography-mass spectrometry (LC-MS), to enhance compound identification and quantification.
- CO3:** Apply their knowledge to practical scenarios and research projects. They will possess the skills to select appropriate chromatographic techniques based on the characteristics of analytes, separation requirements, and analytical objectives.
- CO4:** Grasp the modern extraction and separation techniques, including solid-phase extraction, solid-phase microextraction, sonic extraction, and accelerated solvent extraction.

Unit No.	Syllabus	No. of Lectures
Unit I:	Advanced Gas Chromatographic Techniques Principles, Plate theory, Instrumentation and working of a Gas Chromatograph, sampling, sample pretreatment, sample injection types, columns, Detectors, programmed temperature G.C., Applications. Pyrolysis gas and vapour phase chromatography-instrumentation and techniques, advantages and applications. Gas chromatography-Mass Spectrometry, interface, instrumentation and applications. Introduction to TGA-MS/TGA-GC-MS and significance. Practical applications and examples in analytical chemistry	15 Hrs

	and research.	
Unit II:	<p>Advanced Liquid Chromatographic Techniques</p> <p>High Performance Liquid Chromatography (HPLC) and Ultra Performance Liquid Chromatography (UPLC)-Principle, instrumentation, mobile phase, Stationary support in HPLC, detectors and applications. Super critical fluid chromatography (SCFC), characteristics, instrumentation and applications. Comparison of HPLC and GLC with SCFC. Liquid Chromatography-Mass Spectrometry interface, instrumentation, advantages and applications. Practical applications and examples in analytical chemistry and research.</p>	15 Hrs
Unit III:	<p>Ion Chromatography</p> <p>Principles, structure and characteristics of resins, eluent, suppressor columns and detectors used in Ion Chromatography, commercial scope, analytical applications, environmental speciation by Ion Chromatography. Practical applications and examples in analytical chemistry and research.</p>	15 Hrs
Unit IV:	<p>A) Modern extraction and separation techniques</p> <p>Basic principles, classification of solvents extraction systems, extraction equilibria, factors affecting extraction process , application of β- diketones , δHydroxyquinoline , dithiocarbamaes , xanthenes , Thio, separation of non metals and metals. Separation of transition metal ions using ion exchangers. Solid phase extraction, solid phase microextraction, sonic extraction, accelerated solvent extraction, soxhlet extraction.</p>	08 Hrs

	<p>B) Extractive Chromatographic Separations</p> <p>Introduction, Theoretical aspects of extraction chromatography, solvent extract extraction chromatography with chelating ligands, extracion chromatography by ion pair formation, extraction chromatography by solvation, extraction equilibria, nature of stationary phase in extraction chromatography, inert support, techniques in extraction chromatography, extraction chromatography with tributyl phosphate and other applications. Practical applications and examples in analytical chemistry and research.</p>	<p>08 Hrs</p>
--	--	----------------------

Recommended Books:

- 1) A.I. Vogel, a text Book of Quantitative Inorganic Analysis.
- 2) W H Willard, L L Merritt and J A Dean, Instrumental Methods of Analysis.
- 3) S. M. Khopkar, Basic Concepts in Analytical Chemistry.
- 4) LR. Shyder and C.H. Harvath, An Introduction to separation Science. Wiley Interscience.
- 5) James S Fritz and George H. Schenk Jr. Quantitative Analytical Chemistry, 2nd editions Allyn and Bacon Inc. Bosten.
- 6) J.G. Dick, Analytical Chemistry.
- 7) R.L. Pescok and L.D. Shield, Modern Methods of Chemical Analysis.
- 8) O. Samuelson : Ion Exchange separation in analytical chemistry (Jhon wiley , 1963)
- 9) Y. Marcus and A. S. Kertes : Ion Exchange and solvent Extraction of metal complexes (Wiley - Interscience , 1969)
- 10) J. A. Marinsky and Y. Marcus : Ion exchange and solvent Extraction (Marcel Dekker, INC , New York, 1973)
- 11) G. H. Morrison and H, Freiser : Solvent Extraction in Analytical Chemistry (John Wiley, New York, 1958)
- 12) A. K. Da, S. M .Khopkar and R. A. chalmers :solvents Extraction of metals (Von Nostrant Ravinhold, 1970)

Paper No. - XIV: Organic Industrial Analysis (CC - 2207D)
Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Understand the various chemical analysis techniques used in the industrial context.
- CO2:** Perform quality control analyses and ensure compliance with regulations in various industries. They will be capable of analyzing raw materials, additives, and finished products to assess their composition, purity, and adherence to industry standards.
- CO3:** Understand the principles of various techniques such as chromatography, spectrophotometry, titration, and bomb calorimetry.
- CO4:** Develop problem-solving skills to address issues related to contamination, adulteration, impurity identification, and quality assurance.

Unit No.	Syllabus	No. of Lectures
Unit I:	Industrial Analysis A) Analysis of oils, fats and Soaps Introduction to natural fats and oils; isolation of oils from natural resources and their purification. Analysis of oils and fats: Softening point, Congeal point, Titre point, Cloud point, Iodine, saponification, acid, hydroxyl, R-M and Polenske value, Elaiden test, etc. Introduction to soaps, manufacture of soaps (in brief), analysis of soaps: total anhydrous soap and combined alkali, potassium, water, free fatty acids, saponifiable and non-saponifiable matter in soaps, estimation of phenol, copper and germicidal agents in soaps, determination of inorganic fillers and soap builders, and other additives, estimation of soap in detergents (THAM method)	08 Hrs

	<p>B) Analysis of Detergents</p> <p>Classification of detergents, analysis of raw materials, separation as alcohol soluble and alcohol insoluble matter, additives in detergent formulation (chlorides, sulfates, phosphates, silicates, borates, oxygen releasing substances, CMC, EDTA, etc.), their role and analysis; analysis of active ingredients in detergents (methylene blue and Hyamine-1622 method).</p>	07 Hrs
Unit II:	<p>Food and Food Additive Analysis</p> <p>A) Food Analysis</p> <p>Food flavors, food colors, food preservatives, analysis of milk and milk products, adulterants in milk and their identification, analysis of honey, jam and their major component. Practical applications and examples in analytical chemistry and research.</p> <p>B) Food Additive Analysis</p> <p>Additives in animal food stuff: Antibiotics: penicillin, chlorotetracyclin, oxytetracyclin in diet supplements; Identification and estimation of growth promoting drugs such as. sulfaquinoxaline, methyl benzoquate, sulfanitran, pyrimethamine, nitrovin, nitrofurazone, acinitrazole, etc</p>	08 Hrs 07 Hrs
Unit III:	<p>Analysis of cosmetics products</p> <p>Introduction to cosmetics, definition, types of cosmetics, background, development in cosmetic industry, issues in cosmetic industries (contamination and adulteration), future scope and role of analytical chemistry.</p> <p>A) Analysis of cream and lotions</p> <p>Composition of creams and lotions, determination of water, propylene glycol, non-volatile matter and ash content;</p>	15 Hrs 08 Hrs

	<p>estimation of borates, carbonates, sulphates, phosphates, chlorides, ammonia, nitromethane, oxalic acid, 4- hydroxy benzoic acid, sodium iodate, free formaldehyde, H₂O₂, mercatoacetic acid, titanium and zinc oxides. Practical applications and examples in analytical chemistry and research.</p> <p>B) Analysis of face powder</p> <p>Composition of face powder, estimation of boric acid, Mg, Ca, Zn, Fe, Al and Ba. Analysis of deodorants and antiperspirants-composition, analysis of fats and fatty acids, boric acid, magnesium, calcium, zinc, iron, titanium, aluminium, phenol, methanamine, hexachlorophenone, sulphonates, urea, etc. Practical applications and examples in analytical chemistry and research.</p>	<p>07 Hrs</p>
<p>Unit IV:</p>	<p>Analysis of Paints, pigments and petroleum products</p> <p>A) Analysis of Paints and pigments</p> <p>Composition of paint, preliminary inspection of sample, test on the total coating, separation and estimation of pigments, binder and thinner of latex paints; modification of binder, flash point of paints. Practical applications and examples in analytical chemistry and research.</p> <p>(B) Analysis of petroleum products</p> <p>Introduction, constituents and petroleum fractionation, quality control; - specific gravity, viscosity, Cloud point, pour point, flash point, vapor pressure, Doctor test, sulphuric acid absorption, aniline point, and colour détermination, cloud point, pour point. Determination of water, neutralization value (acid and base numbers),ash content, sulphur and mercaptan sulphur. Determination of lead in petroleum; Analysis of coal and coke: Types,</p>	<p>08 Hrs</p> <p>07 Hrs</p>

composition, preparation of sample, proximate and ultimate analysis calorific value by Bomb Colorimetry.	
--	--

Reference Books:

- 1) S. R. Junk and H. M. Pancoast: Hand book of sugars (AVI)
- 2) B. Bilot and B. V. Well: Perfumary technology (JW)
- 3) I. M. Kolthoff: Treatise on Analytical Chemistry Vol. I and II
- 4) D. Pearson: Laboratory techniques in food analysis.
- 5) S. Ranganna: Handbook of Analysis and Quality control for fruits and vegetable products, 2nd Ed. (Mc Graw Hill.)
- 6) Nicholls: Aids to the analysis of foods and drugs.
- 7) G. J. Mountrey: Poultry product technology (AVI)
- 8) Karamer Twig: Quality control for food industry (AVI)
- 9) G. F. Longonan: the analysis of detergents and detergent products (JW)
- 10) A. Davidsohn & B. M. Mlwidaky : Synthetic detergents (Book center, Mumbai)
- 11) M. Ash and L. Ash: A formulary of cosmetic preparations. (G. Goodwin)
- 12) Kurl Bauer, Dorothea Garhe, Horst Surburg: Common fragrance and flavour materials, (VCH publisher, New York)
- 13) F. J. Welcher: Standard Methods of Chemical analysis Vol I & II (6th Ed.)
- 14) S. N. Mahendru: Analysis of food products (Swan Publishers)

Paper No. - XV: Advanced Methods in Chemical Analysis (CC - 2208D)

Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Understand the fluorescence and phosphorescence spectrophotometry. They will be able to explain the different types of luminescence, understand the theories behind fluorescence and phosphorescence, and discuss electronic transitions, solvatochromism, and solvation dynamics.
- CO2:** Adopt various kinetic methods of analysis. They will understand the theoretical basis behind kinetic techniques and be able to apply methods such as the Tangent Method, Fixed Time and Concentration Method, and Addition Method to determine the amount of substances in various samples.
- CO3:** Grasp the photoelectron spectroscopy and X-ray spectroscopy techniques. They will understand the basic principles of photoelectric effects, photoionization processes, Koopman's theorem, and the interpretation of photoelectron spectra.
- CO4:** Apply their knowledge of spectroscopic techniques to practical applications in analytical chemistry and research. They will understand how fluorescence sensing, synchronous spectra, and fluorescent nanomaterials can be utilized for specific analytical purposes.

Unit No.	Syllabus	No. of Lectures
Unit I:	Fluorescence and Phosphorescence Spectrophotometry Fluorimetry, types of luminescence, Instrumentations, theories of fluorescence and phosphorescence, electronic transition, structural factors, solvatochromism, solvation dynamics, faith of excited molecules, solvent effect on fluorescence, effect of intermolecular process, fluorescence anisotropy and time domain fluorescence life time measurements. Relation between concentration with fluorescence and phosphorescence intensity, fluorescence	15 Hrs

	quenching mechanism, resonance energy transfer. Chemiluminescence, Fluorescence sensing, Synchronous spectrum, Fluorescent nanomaterials. Practical applications, examples and problems in analytical chemistry and research.	
Unit II:	Kinetic Methods of analysis Theoretical basis of kinetic methods of analysis, methods of determining amount of the substance, Tangent Method, Fixed Time and Concentration method. Addition Method, Oxidation Reactions of H ₂ O ₂ with thiosulphate, iodide and amino, Enzyme catalyzed reactions. Inhibitors and Activators.	15 Hrs
Unit III:	Photoelectron spectroscopy Basic principles, photoelectric effects, Photoionization process, Koopman's theorem, photoelectron spectra of simple molecules, ESCA, chemical shift, Auger electron spectroscopy - basic idea.	15 Hrs
Unit IV:	X-ray spectroscopy Introduction, X-Ray generation, Properties of X-radiation, X-Ray, Instrumentation, X-Ray Absorption, Fluorescence and Diffraction methods of analysis and their applications	15 Hrs

Recommended Books:

- 1) Gary D Christian, Analytical chemistry 6th edition. John Willey and sons INC (2003) H.
- 2) Kaur, Instrumental Methods of Chemical Analysis. Pragati Prakashan, Meerut.
- 3) W H Willard, L L Merritt and J A Dean, Instrumental Methods of Analysis.
- 4) S. M. Khopkar, Basic Concepts in Analytical Chemistry.
- 5) D. Skoog and D. West, Principle of Instrumental Analysis. Holl Seamlers.

- 6) E. Berlin, Principles and Practice of X-Ray Spectrometric Analysis, Plenum, NewYork.
- 7) J. Winefordner, S. Schulman and T O Haver: Luminescence Spectrometry in
- 8) Analytical Chemistry. Wiely Interscience New York.
- 9) H. Mark and G Rachnitz, Kinetics in Analytical chemistry. Interscience NY.
- 10) Gary D Christian, Analytical chemistry 6th edition. John Willey and sons INC
(2003)
- 11) Engineering chemistry, R Gopalan, G. S. Nagrajan.
- 12) Engineering chemistry B. K. Sharma

Elective Papers
Paper No. - XVI (A): Industrial Analytical Chemistry (CC - 2209D)
Theory: 60hrs

Course Outcomes: After the completion of the course, the student will be able to:

- CO1:** Apply the various spectrochemical methods used for analytical purposes. They will understand the principles behind electronic spectra and molecular structure, be familiar with near-infrared (NIR) spectrometry for non-destructive testing, and comprehend the use of FTIR spectrometry, fluorometry, and optical sensors
- CO2:** Analyze metals and alloys. They will understand the composition analysis of foundry materials, ferroalloys, special steels, and various alloys like bronze, brass, Alnico, and Nichrome.
- CO3:** Understand the soil fertility determination, analysis of inorganic constituents in plant materials, and the chemical analysis as a measure of soil fertility. Students will be able to analyze fertilizers for their nutrient content and quality.
- CO4:** Understand the analysis of explosive materials such as TNT, RDX, lead azide, and EDNA. Additionally, students will be proficient in analyzing conducting polymers, resins, rubber, luminescent paints, lubricants, and adhesives, utilizing appropriate analytical techniques and methods.

Unit No.	Syllabus	No. of Lectures
Unit I:	Spectrochemical Methods of Analysis Introduction to spectrochemical methods. Electronic spectra and molecular structure, NIR spectrometry for nondestructive testing. Solvents for spectrometry ,FTIR spectrometer ,fluorometry, optical sensors. Analysis of ores - bauxites, dolomites, monazites. Analysis of Portland cement.	15 Hrs

Unit II:	Analysis of metals and alloys Foundry materials, ferroalloys, and special steels, slags, fluxes. Analysis of alloys ,bronze, brass, Alnico and Nichrom	15 Hrs
Unit III:	Analysis of soil and fertilizers Method of soil analysis, soil fertility its determination, determination of inorganic constituents of plant materials, Chemical analysis as measure of soil fertility, analysis of fertilizers.	15 Hrs
Unit IV:	Analysis of Commercial materials Analysis of explosive materials, TNT, RDX, lead azide, EDNA (ethylene dinitramine).Analysis of conducting polymer, resins and rubber. Analysis of luminescent paints, Analysis of lubricants and adhesive.	15 Hrs

Recommended Books:

- 1) Hillebrand Lhundel, Bright and Hoffiman, Applied Inorganic Analysis, John Wiley.
- 2) Snell and Biffen, Commercial Methods of Analysis.
- 3) P.G. Jeffery, Chemical Methods of Rock Analysis, Pergamon.
- 4) Buchel, Chemistry of Pesticides. J Wiley.
- 5) Rieche, Outlines of Industrial Organic Chemistry, ButterWorth.
- 6) F.A. Henglein, Chemical Technology, Pergamon.
- 7) Kent, Riegl's Industrial Chemistry, Rainhold.
- 8) Chopra and Kanwar, Analytical Agriculture Chemistry, Kalyani Publishers.
- 9) Aubert and Pintes, Trace Elements in Soils.
- 10) Bear, Chemistry of Soil.
- 11) Hauson, Plant Growth Regulators, Noyes.
- 12) P.G. Jeffery and D.J. Hatchinson, Chemical Methods of Rock Analysis.

- 13) F.J. Weleher, *Standard Methods of Chemical Analysis, A Series of Volumes* Robert and Krigeger Publishing Company.
- 14) I. M. Kolthoff and PJ Ewing, *Treatise o Analytical Chemistry, A series of Volumes.*
- 15) R.D. Reeves and R.R. Brooks, *Trace element Analysis of Geological Materials,* John Wiley & Sons NewDehli.
- 16) W.M. Johnson and J.A. Maxwell, *Rock and Mineral Analysis,* John Wiley and Sons, NewYork.
- 17) W. F. Hildebrand, G H C Landell and HA Brighot, *Applied Inorganic Analysis,* John Wiley 2nd Edition.
- 18) K. J. Das, *Pesticide Analysis (MD).*

Paper No. - XVI (B): Quality Assurance and Accreditation (CC - 2210D)
Theory: 60hrs

Unit No.	Syllabus	No. of Lectures
Unit I:	Quality Assurance Introduction to Quality Control and quality assurance: Concepts and significance. Quality control and statistical techniques: Quality control charts, the X-quality control chart, the R-quality control chart and its interpretation, spiked sample control charts, use of blind samples in quality control, use of proficiency evaluations in quality control. Calibration and maintenance of Instruments / Equipment: Instrument calibration - linear calibration curves, equipment calibration, frequency of calibration, calibration of common laboratory instrument and equipment (Analytical balances, volumetric glassware, ovens, furnaces, UV / Visible spectrophotometer, pH meter, conductivity meter, IR spectrophotometers, AAS, GC, HPLC etc.). Maintenance of instruments and equipment	15 Hrs

Unit II:	Documentation for Quality Assurance: Raw Data Type of notebooks, control of notebook distribution and data entry. General Reagents and volumetric reagents. Sampling - sampling methods, sample labelling, sample login/register. Sample analysis, reporting, recording and personal training. Instrument calibration and maintenance. Analytical report, Personnel, training, records - professional personnel, technician personnel. Filing quality assurance documentation. Good laboratory practices and personnel, Quality Programme, Instrument and Organisation calibration, Customer Satisfaction.	15 Hrs
Unit III:	Documentation for Quality Assurance: Raw Data Computers and quality assurance: Sample handling. Data Acquisition. Quality control data and calculations. Computer generated analytical reports. Security considerations. Hardware and software. Establishing a Quality Assurance program: Management commitment. Define the quality assurance program. Writing standard operating procedures. Topics for standard operating procedures. Consolidating the programme. Monitoring the program - monitoring quality assurance data, reporting quality assurance problems. Writing the quality assurance manuals.	15 Hrs
Unit IV:	Quality Accreditation Laboratory Accreditation: Need for laboratory accreditation. International aspects of laboratory accreditation and in India. Criteria for laboratory accreditation. Benefits of laboratory accreditation, Evolution and significance of Quality Management, Background to ISO 9000, comparison between ISO-9001, ISO-9002 & ISO-9003., ISO 9000-2000	15 Hrs

	<p>series of standards on quality managementsystem,- evolution of series of standards, introduction to ISO organization, Registration/ certification- benefits of QMS certification. Structure of ISO 9000-2000 family of standards. Advantages of ISO 9000-2000. Requirements of ISO 9001-2000 QMS and applications, Steps for effective implementations. Significance of ISO - 9001, 9002, 9003 & 9004. Requirements of ISO9000/ IS14001. Concepts of OHSMS (BS 8800) Quality Managment Principles in QMS, QMS documentation, Quality Manual, Quality policy, conformities and Nonconformities</p>	
--	--	--

Recommended Books:

- 1) Handbook of Quality Assurance for the analytical chemistry laboratory, James P. Dux, Van Nostrand Reinhold, New York, 1986.
- 2) Applying ISO-9000 Quality Management Systems, International Trade Centre Publishing, UNCTAD/WTO. Geneva, Switzerland, Indian Edition Printed by D.L.Shah Trust.
- 3) How to practice GLP, PP Sharma, Vandana Publications, 2000, New Delhi
- 4) Training manuals on ISO 9000 / 2000 PQM, Girdhar J Gyani, Raj Publishing House, 2001
- 5) Quality Assurance in Analytical Chemistry, B.W. Wenclawiak, Springer, India, 2004.

**M. Sc. Part - II (Semester - III) Analytical Chemistry
Practical Course -V and VI (CC - 2211D and CC - 2212D)**

Practical courses include Submission of project work.

List of Experiments:

Major

1. Cement analysis
2. Analysis of Chrome steel alloy for Cr and Ni content
3. Analysis of bauxite ore to estimate the amount of silica, aluminium and iron.
4. Estimation of salicylic acid and zinc oxide from medicated powder
5. Determination of saponification value and iodine value of oil
6. Estimation of amount of copper (II) with EDTA spectrophotometrically.
7. Simultaneous spectrophotometric determination of Cr and Mn
8. Analysis of milk.
9. Analysis of some common pesticides, insecticides, plastics and detergents.
10. Estimation of Urea, Uric acid and creatinine in Urine.
11. Estimation of blood sugar, calcium and total nitrogen and non-protein nitrogen in blood.
12. Studies on the effect of substituent at ortho position of benzoic acid on its equilibrium constant pH metrically.
13. Agricultural analysis of soil sample, animal feeds, soil micronutrients, milk powder for Ca, Fe and P content.

Minor

1. Estimation of Fe from soil sample
2. Analysis of Na and K from soil sample
3. Determination of chemical oxygen demand of water sample (dye solution)
4. Estimation of lactose from milk sample
5. Determination of flash point of oil/fuel
6. To estimate the amount of glycine from amino acid
7. To determine the amount of alkali content of antacid tablet titrimetrically
8. Determination of dissociation constant of weak acid pH-metrically.

9. Estimation of Zn in the given solution fluorimetrically.
10. Determination of pK of tribasic acid, by potentiometry.
11. Determination of critical micelle concentration of given surfactants conductometrically
12. Estimation of acetyl salicylic acid in the given aspirin tablet by titrating against 0.1N alcoholic KOH potentiometrically.
13. To determine the acid base dissociation constant and isoelectric point of amino acid pH metrically
14. (Any other experiments may be added when required.)

(At least 6 major and 6 minor experiments should be carried out. More time should be given to project work)

B) Project:

Projects on contemporary issues of societal significance which should include literature survey, synthesis, reaction mechanism and kinetics, analysis of air, water and soil samples, solid state materials, energy generation and storage materials, nanochemistry, green chemistry, organic materials, organo-metallic, bioinorganic materials, novel materials etc. The Project/Review work (50 Marks) will be examined jointly by internal and external examiners at the time of practical examination.

(Any other experiments may be added when required.)

Study tour is compulsory for M. Sc. Part - II Students to visit Chemical Industries in India

Scheme of teaching and examination

- The semester examination will be conducted at the end of each term (both theory and practical examination)
- Theory paper will be of 80 marks each and 20 marks for internal evaluation test conducted in the mid of the term. Two practicals will be of 100 marks each.
- Question papers will be set in the view of the entire syllabus and preferably covering each unit of the syllabus.

Nature of Question Paper and Scheme of Marking

1. There shall be 7 questions carrying 16 marks each.
2. Question No. 1 is compulsory. It consists of fill in the banks, objective or answer in one sentence type questions.
3. The remaining question No. 2 to 7 are divided into two sections (Section I and II).
4. Section I consists of question No 2, 3 and 4.
5. Section II consists of question No 5, 6 and 7.
6. Questions 2 to 6 consists of 2 or 3 sub questions.
7. Question No 7 consists of sub questions in which students have to write short notes on any three or four sub questions among the given options.

Nature of Question Paper

M.Sc. (Part-I/II) Semester-I/II/III/IV (CBCS) Examination

Name of the Paper (Paper No.....)

Sub. Code:

Day & Date: _____

Time: _____

Total Marks: 80

-
- Instructions:*
- 1) *Question one is compulsory.*
 - 2) *Attempt any 'TWO' questions from each section.*
 - 3) *All questions carry equal marks.*
 - 4) *Figures to the right indicate full marks.*
 - 5) *Neat and labelled diagram should be drawn wherever necessary.*

Q. 1) Answer the following. (One mark each) [16]

SECTION-I

Q. 2) i. [8]
ii. [4]
iii. [4]

Q. 3) i. [8]
ii. [4]
iii. [4]

Q. 4) i. [8]
ii. [4]
iii. [4]

SECTION-II

Q. 5) i. [8]
ii. [4]
iii. [4]

Q. 6) i. [8]
ii. [8]

Q. 7) Write a note on. (any four) [16]
i.
ii.
iii.
iv.
v.
vi.

“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF PHYSICS

M.Sc. Part - I
Semester-III & IV

SYLLABUS

Under Choice Based Credit System

to be implemented from Academic Year 2019-20

Department of Physics (2019-20)
M.Sc. (Physics) (Part-II)
CORE PAPER (COMPULSORY)-(CP) CHOICE BASED PAPER-
(CBP)

M.Sc. (Physics) Part -II Semester-III (Total Credits = 24)		
Paper Code	Paper Title	Credits
CC-1112C	Nuclear and Particle Physics (Compulsory)	4
CBP-1113C	(Thin film deposition and other techniques)	4
CC-1114C	SOLID STATE PHYSICS- I (Thin film deposition techniques- Magnetic and Electric properties)	4
CC-1115C	SOLID STATE PHYSICS- II (Semiconductor Physics)	4
CPPR-1116C (Practical Lab-I)	Laboratory/ Practical Course-I SOLID STATE PHYSICS LAB –I	4
CPPR-1117C (Practical Lab-II)	Tutorial I + Research Project	4
M.Sc. (Physics) Part -II Semester-IV (Total Credits = 24)		
Paper Code	Paper Title	Credits
CC-1118D	EXPERIMENTAL TECHNIQUES	4
CBP-1119D	Electronic Devices and applications	4
CC-1120D	SOLID STATE PHYSICS- III (Physical properties of solid)	4
CC-1121D	SOLID STATE PHYSICS-IV (Energy Conversion and Storage Devices)	4
CPPR-1122D (Practical Lab-III)	Laboratory/ Practical Course-II SOLID STATE PHYSICS LAB –II	4
CPPR-1123D(Practical Lab-IV)	Tutorial II + Research Project	4

M.Sc. II Semester - III Paper- I
Nuclear and Particle Physics
(CC-1112C)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits -4

Course Outcomes: After the completion of the course the student will be able to -

CO-1) Acquire basic knowledge about Nucleon-Nucleon interaction, deuteron problem, n-p ,p-p and N-N scattering , nuclear forces etc.

CO-2) Understand the Elementary ideas of alpha, beta and gamma decays, nuclear fission and fusion reactions mechanism.

CO-3) Develop the understanding of cosmic rays and elementary particles and their properties.

CO-4) Learn about the concept of particle physics classification like charge, spin, parity, isospin, strangeness etc.

Unit	Syllabus	Lectures
Unit 1	Unit-I Nucleon-Nucleon Interaction: Nature of the nuclear forces, form of nucleon-nucleon potential, Deuteron problem: The theory of ground state of deuteron, excited states of deuteron, n-p scattering at low energies (cross- section, phase shift analysis, scattering length, n-p scattering for square well potential, effective range theory); p-p scattering at low energies (cross-section, experiment , and results) ; exchange forces, tensor forces; high energy N-N scattering (qualitative discussion only of n-p and p-p scatterings), charge-independence and charge-symmetry of nuclear forces.	15
Unit 2	Nuclear Reactions: Elementary ideas of alpha, beta and gamma decays and their classifications, characteristics, selection rules and basic theoretical understanding. Nuclear reactions, reaction mechanism, Compound nucleus reaction (origin of the compound nucleus hypothesis, discrete resonances, continuum states), optical model of particle-induced nuclear reaction and direct reactions (experimental characteristics, direct inelastic scattering and transfer reactions). Fission and fusion, Fission, and heavy ion reactions.	15
Unit 3	Cosmic rays and elementary particles Concept of cosmic rays and their properties, secondary radiations Cosmic ray stars, Electronic showers-geomagnetic, latitude, longitude and azimuth effects, Elementary particles and their properties.	15
Unit 4	Particle Physics: Classification of fundamental forces. Classification of Elementary particles and their quantum numbers (charge, spin, parity, isospin, strangeness, etc.). Gellmann-Nishijima formula. Quark model, CPT invariance. Application of symmetry arguments to particle ,reactions, Parity non- conservation in weak interaction, Relativistic kinematics.	15

Reference Books:

1. Nuclear and Particle Physics- W.E. Burcham and M.Jobes, (AddisonWesley, Longman, England,
2. Introduction to Particle Physics- M.P. Khanna (Prentice Hall, India, 1999).
3. Concept of Nuclear Physics, B.L. Cohen, (Tata McGraw-Hill, 2005)
4. Nuclear Physics Principles and Applications, John Lilley, (John Wiley and Sons (Asia) 2001)
5. Nuclear physics – D. C. Tayal. (Himalaya Publishing House,1997)
6. Nuclear Physics- Irving Kaplan (Narosa, Madras, 1989).
7. Fundamentals of Nuclear Physics- Srivastava, Rastogi publications

M.Sc. II Semester - III Paper- II
Thin film deposition and other techniques
(CBP-1113C)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits -4

Course Outcomes: After the completion of the course the student will be able to -

CO-1) Gain basic knowledge of deposition techniques like Chemical Vapor, Spray and other like, electro spray, electroplating, Spin coating, SILAR.

CO-2) clarify the concepts of Solid solutions like substitutional, disordered, ordered, interstitial hardening, Age hardening, dispersion hardening, phase transformation hardening principles of hot and cold working of metals and their effects on mechanical properties.

CO-3) impart knowledge of Raman Scattering rotational and vibrational spectra, Raman Electron Spin Resonance (ESR Hyperfine structure, ESR of Transition metals

CO-4) develop the understanding of Heat treatment furnaces like Oil and Gas fired furnaces, Electric furnaces, Batch furnace and their types, Semi continuous and continuous furnace, Air convection furnace, salt bath furnace etc.

Unit	Syllabus	Lectures
Unit 1	Chemical Vapor, Spray and other deposition techniques Introduction, reaction types, thermodynamics of CVD, gas transport and growth kinetics, CVD process and basic systems; Low-Pressure CVD (LPCVD), Spray deposition Introduction, basic instrumentation, different type of spray techniques; spray pyrolysis technique, electrospray deposition technique, advantages and disadvantages of spray deposition techniques. Electroplating, Spin coating, SILAR technique.	15
Unit 2	Solid solutions and strengthening of metals Types of solid solutions, substitutional, disordered, ordered, interstitial solid solution, intermediate phases, Hume Rothery's rules, concept of solidification of metals-nucleation, homogeneous and heterogeneous nucleation, growth its new phase and phase change kinetics, solid solution hardening, Age hardening, dispersion hardening, phase transformation hardening principles of hot and cold working of metals and their effects on mechanical properties.	15
Unit 3	Raman and ESR Techniques Raman Scattering-introduction theory , Rotational and Vibrational spectra, Raman spectrometer Fourier transform Raman spectrometer, Structure determination using IR and Raman - Electron Spin Resonance(ESR)-Principle, construction and working , Total Hamiltonian, Hyperfine structure, ESR of Transition metals	15
Unit 4	Heat treatment furnaces Definition and concept of furnace, types of heat treatment furnaces : Oil and Gas fired furnaces, Electric furnaces, Batch furnace and their types, Semi continuous and continuous furnace, Air convection furnace, salt bath furnace-advantages and limitations, Furnace atmosphere and temperature control.	15

References:

1. The Material Science of thin films by Milton Ohring.
2. Coatings on Glass (volume 6) by H. K. Pulker.
3. Langmuir Blodgett films (volume 3) by C. W. Pitt, G. G. Roberts.
4. Handbook of thin film Technology by Frey, Hartmut, Khan and Hamid R.
5. Thin film Technology and Application by K. L. Chopra & L. K. Malhotra.

6. Deposition Technology for films and coatings by Rointan F. Bunshah.

M.Sc. II Semester - III Paper- IV

**SOLID STATE PHYSICS- I (Thin film deposition techniques-
Magnetic and Electric properties)**

(CC-1114C)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits -4

Course Outcomes: After the completion of the course the student will be able to -

CO-1) Provide a critical and systematic understanding on advanced Physical methods of thin film deposition like vacuum, evaporation, Chemical vapor deposition, sputtering, etc

CO-2) Provide a critical and systematic understanding on advanced chemical methods of thin film deposition like Chemical bath deposition, electro deposition, Spray pyrolysis, (SILAR), Sol-gel, hydrothermal deposition techniques etc.

CO-3) Learn the basics of the Magnetic behavior of various materials and their types

CO-4) Understanding of electrical properties in solids, Wiedermann-Franz law, Hall Effect, magneto resistance, thermionic emission

Unit	Syllabus	Lectures
Unit 1	Physical methods of thin film deposition Vacuum deposition apparatus: Vacuum systems, substrate deposition technology, substrate materials, substrate cleaning, masks and connections, multiple film deposition, Thermal Evaporation methods: Resistive heating, Flash evaporation, Arc evaporation, laser evaporation, electron bombardment heating, Sputtering: Introduction to sputtering process and sputtering variants, glow discharge sputtering, Magnetic field assisted (Triode) sputtering, RFSputtering, Ion beam sputtering, sputtering of multicomponent materials	15
Unit 2	Chemical methods Chemical vapor deposition: Common CVD reactions, Methods of film preparation, laser CVD, Photochemical CVD, Plasma enhanced CVD, Chemical bath deposition: ionic and solubility products, preparation of binary semiconductors, Electrodeposition: Deposition mechanism and preparation of compound thin film Spray pyrolysis : Deposition mechanism and preparation of compound thin films, Chemical bath deposition, successive ionic layer adsorption reaction method (SILAR) method, Sol-gel method, Hydrothermal method	15
Unit 3	Magnetism in solids Types of magnetism: Langevin's classical and quantum theory in diamagnetism, paramagnetism, ferromagnetism- Magnetostriction, Weiss theory and molecular field concept of domains, Antiferromagnetism, Ferromagnetism	15
Unit 4	Electrical Properties in solids Classical theory of electric conduction and its temperature dependence, Wiedermann-Franz law, Electron scattering and sources of resistance in metals, variation of resistivity with temperature, resistivity of alloys, mechanical effects on electrical resistance, conductivity at high frequencies, effect of the magnetic fields- hall effect and magnetoresistance, thermionic emission	15

Reference Books:

1. Thin Film Phenomena by K L Chopra McGraw -Hill Book Company, NY 1969
2. The Materials Science of Thin Films by Milton Ohring, Academic Press, (1992) (unit4)

3. Properties of Thin Films by Joy George, Marcel and Decker, (1992)
4. Physics of Thin Films by LudmilaEckertová, Springer (1986)
5. Thin Film Technology by O S Heavens, Methuen young books (1970) (1970)
6. Solid state Physics-R.K.Puri, V.K.Bubber(1999)
- 7.

M.Sc. II Semester - III Paper- IV
SOLID STATE PHYSICS- II (Semiconductor Physics)
(CC-1115C)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits -4

Course Outcomes: After the completion of the course the student will be able to -

CO-1) get critical and systematic understanding of energy bands and charge carriers in Semiconductors.

CO-2) Learn the basics of excess carriers in semiconductors, Optical absorption, Luminescence, diffusion and drift of carriers.

CO-3) Provide a broad view of fabrication of p-n junctions and current flow through at a junction, Capacitance of p-n junctions, heterojunction.

CO-4) Provide a broad view of current flow mechanism across p-n junction.

Unit	Syllabus	Lectures
Unit 1	Energy Bands and Charge Carriers in Semiconductors: Bonding forces and energy bands in solids, Direct and Indirect semiconductors, variation of energy bands with alloy composition, Charge carriers in semiconductors: electrons and holes, effective mass, intrinsic and extrinsic materials, electrons and holes in quantum wells, The Fermi level, carrier concentration at equilibrium, temperature dependence, space charge neutrality, conductivity and mobility, Drift and resistance, effects of temperature and doping on mobility, High field effects.	15
Unit 2	Excess Carriers in Semiconductors: Optical absorption, Luminescence, Direct recombination of electrons and holes, Indirect recombination and trapping, steady state carrier generation and Quasi Fermi levels, Diffusion processes, Diffusion and Drift of carriers, built-in fields, The continuity equation, steady state carrier injection, diffusion length, The Haynes-Shockley experiment.	15
Unit 3	Junctions-I Fabrication of p-n junctions; Thermal oxidation, diffusion, Rapid thermal processing, Ion implantation, CVD, Photolithography, etching, metallization, The contact potential, Space charge at a junction, qualitative description of current flow at a junction, reverse-bias breakdown, Zener and Avalanche breakdown.	15
Unit 4	Junctions-II Capacitance of p-n junctions, the Varactor diode, recombination and generation in the transition region, ohmic losses, graded junctions, schottky barriers, rectifying contacts, ohmic contacts, heterojunctions, AlGaAs-GaAs heterojunction.	15

References:

1. Solid state electronic devices by B. G. Streetman.
2. Physics of semiconductor devices by S. M. Sze.
3. Solid State and Semiconductor Physics by McKelvey.
4. Principles of Electronic Materials and Devices by S.O. Kasap

M. Sc. II Semester III
Course Code: CPPR- 1116C
Paper title: Physics LAB-I
Total Credits: 4-credits
Laboratory/ Practical Course-I
Solid State Physics Lab –I

Practical : Sem III

1. Thin film deposition by dip-coating method
2. Microwave assisted synthesis of thin film
3. Thin film deposition by Reflux method
4. Thin film deposition by CBD method
5. Thin film deposition by spray pyrolysis method
6. Thin film deposition by SILAR method
7. Thin film deposition by Electrodeposition method
8. Thin film deposition by Hydrothermal method
9. Nanoparticles preparation by sintering method

CPPR-1117C (Practical Lab-II)

4 Credit

Seminar +Tutorials on practical Course-I

M.Sc. II Semester - IV Paper- I
EXPERIMENTAL TECHNIQUES

(CC-1118C)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits -4

Course Outcomes: After the completion of the course the student will be able to -

CO-1) Provide a critical and systematic understanding on vacuum techniques like rotary, diffusion, and sputter ion pumps

CO-2) Provide a critical and systematic understanding on measurement of low pressure and simple methods of LD, palladium barrier and halogen leak detectors.

CO-3) Learn the basics of the Atomic Absorption Spectrometry and Low Temperature and Microscopy Techniques like Optical microscopy, scanning electron microscopy, electron microprobe analysis, low energy electron diffraction.

CO-4) Impart the knowledge about X-Ray Fluorescence Spectrometry and Mossbauer Spectroscopy

Unit	Syllabus	Lectures
Unit 1	Vacuum Techniques Production of low pressures: rotary, diffusion, and sputter ion pumps; measurement of low pressure: McLeod, Pirani, thermocouple & Penning gauges; leak detection : simple methods of LD, palladium barrier and halogen leak detectors.	15
Unit 2	Low Temperature and Microscopy Techniques Production of low temperatures: Adiabatic cooling, the Joule-Kelvin expansion, adiabatic demagnetization, ³ He cryostat, the dilution refrigerator, principle of Pomeranchuk cooling, principle of nuclear demagnetization; measurement of low temperatures. Optical microscopy, scanning electron microscopy, electron microprobe analysis, low energy electron diffraction.	15
Unit 3	Junctions-I Fabrication of p-n junctions; Thermal oxidation, diffusion, Rapid thermal processing, Ion implantation, CVD, Photolithography, etching, metallization, The contact potential, Space charge at a junction, qualitative description of current flow at a junction, reverse-bias breakdown, Zener and Avalanche breakdown.	15
Unit 4	Junctions-II Capacitance of p-n junctions, the Varactor diode, recombination and generation in the transition region, ohmic losses, graded junctions, schottky barriers, rectifying contacts, ohmic contacts, heterojunctions, AlGaAs-GaAs heterojunction.	15

Reference Books:

1. High vacuum techniques- J.Yarwood (Chapman & Hall) 1967
2. Vacuum technology- A.Roth (North-Holland Publishing Company, Amsterdam) 1982
3. Experimental techniques in low temperature physics – G.K.White (Oxford) 1968
4. Low temperature physics – L.C. Jackson
5. Experimental principles & methods below 1K – O.V .Lounasmaa (Academicpress, New York) 1974
6. Modern metallography - R.E.Smallman & K.H.G.Ashbee(Peramon press, Oxford)
7. Microscopy of materials - D.K.Bowen & C.R.Hall (the MacMillan press Ltd.(London) 1975; Chap.1-3.

8. Electron optical applications in materials science- L.E. Murr, (McGraw Hill, New York)1970.

9. Atomic absorption spectroscopy - B.Welz (Verlag Chemie, New York) 1976.

M.Sc. II Semester - IV Paper- I
Electronic Devices and applications
(CBP-1119D)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits -4

Course Outcomes: After the completion of the course the student will be able to -

CO-1] Understand the working ,structure and operation and functions of (BJT), (JFET), MOSFET, MESFET, and diodes.

CO-2] Identify the problems and applications of Magneto-optic and acousto-optic , Piezoelectric, Electrostrictive and magnetostrictive effects.

CO-3] Acquire basic knowledge about Light emitting Diodes, OLED, Infrared LED, Photodetector, Photoconductor, Photodiode, p-n junction Solar cells, ,Semiconductor Lasers

CO-4] Learn the techniques of Thermistor, and sensors.

Unit	Syllabus	Lectures
Unit 1	Transistors and Microwave Devices: Bipolar junction transistor (BJT), frequency response and switching of BJT, Field effect transistor (JFET), MOSFET and related devices, MESFET device structure and its operation, Tunnel diode, Transferred electron devices and Gunn diode, Avalanche transit time diode and IMPATT diode.	15
Unit 2	Photonic Devices: Radiative transitions and optical absorption, Light emitting Diodes, OLED, Infrared LED, Photodetector, Photoconductor, Photodiode, p-n junction Solar cells, Conversion efficiency, Semiconductor Lasers, Laser operation, population inversion, carrier and optical confinement, optical cavity.	15
Unit 3	Other electronic Devices: Magneto-optic and acousto-optic effects, Material's properties related to get these effects, Piezoelectric, Electro strictive and magneto strictive effects, important materials, exhibiting these properties and their applications in sensors and actuator devices.	15
Unit 4	Sensors: Thermal sensors-Thermistor, transistor thermal sensor, non-semiconductor sensors, thermocouple, Mechanical sensors- strain gauge, Magnetic sensors-capacitive sensor-Hall plate, Magneto resistor, Magneto transistor, Chemical Sensors- Metal- Oxide Sensors, Bio sensors	15

Reference Books:

1. Semiconductor devices: Physics and Technology 2nd Edition, S. M. Sze
2. Modern Digital Electronics, R. P. Jain
3. Introduction to Semiconductor devices by M. S. Tyagi
4. Optical electronics by Ajoy Ghatak and K. Thyagrajan, Cambridge University Press.

M.Sc. II Semester - IV Paper- I
SOLID STATE PHYSICS- III (Physical properties of solid)
(CC-1120D)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits -4

Course Outcomes: After the completion of the course the student will be able to -

- CO-1) Understand the matter interaction Electronic Structure of Crystals
- CO-2] Identify the problems and applications of Transport Properties of Metals.
- CO-3] Acquire basic knowledge about Phonons, Plasmons, Polaritons, and Polarons
- CO-4] Impart the knowledge about the Defects in crystals

Unit	Syllabus	Lectures
Unit 1	Electronic Structure of Crystals Basic assumptions of Model, Collision or relaxation times, DC electrical conductivity, Failures of the free electron model, The tight-binding method, Linear combinations of atomic orbitals, Application to bands from s-Levels, General features of Tight-binding levels, Wannier functions, Other methods for calculating band structure, Independent electron approximation, general features of valence band wave functions, Cellular method, Muffin Tin potentials, Augmented plane wave (APW) method, Green's function (KKR) method, Orthogonalized Plane Wave (OPW) method Pseudopotentials	15
Unit 2	Transport Properties of Metals Drift velocity and relaxation time, The Boltzmann transport relation, The Sommerfeld theory of metals of electrical conductivity, The mean free path in metals, Thermal scattering, The electrical conductivity at low temperature, The thermal conductivity of metals, Dielectric Properties of insulators, Macroscopic electrostatic Maxwell equations, Theory of Local Field, Theory of polarizability, Clausius- Mossotti relation, Long-wavelength optical modes in Ionic crystals.	15
Unit 3	Phonons, Plasmons, Polaritons, and Polarons Vibrations of monatomic lattices: first Brillion zone, group velocity, Long wavelength limit,Lattice with two atoms per primitive cell. Quantization of lattice vibrations, Phonon momentum Dielectric function of the electron gas, Plasma optics, Dispersion relation for Electromagnetic waves, Transverse optical modes in a plasma, Longitudinal Plasma oscillations, Plasmons, Polaritons, LST relations, Electron- electron interaction, Electron phonon interaction: Polarons,	15
Unit 4	Defects in crystals Thermodynamics of point defects, Schottky and Frenkel defects, annealing, electrical conductivity of ionic crystals, color centers, Polarons and exciton, dislocations, strength of crystals, crystal growth, stacking faults and grain boundaries	15

Reference Books:

1. Solid State Physics by N W Ashcroft and N D Mermin, HRW, International editions(1996) (Units 1, 2 and 3)
2. Introduction to Solid State Physics by C Kittle (4th edition) John Willey Publication(1979) (Units 3)
3. Solid State Physics by A J Dekker ((1986) Macmillan India Ltd

M.Sc. II Semester - IV Paper- I
SOLID STATE PHYSICS-IV (Energy Conversion and Storage Devices)
(CC-1121D)

Theory: 60 Hours (75 lectures of 48 minutes)

Credits -4

Course Outcomes: After the completion of the course the student will be able to -

CO-1) Understand the concept and applications of Solar Photovoltaics

CO-2] Identify the problems and applications of Dye and Quantum Dot Sensitized Solar Cell.

CO-3] Acquire basic knowledge of Perovskite and Organic Solar cell.

CO-4] Impart the knowledge and provide a broad view about the Supercapacitors and B

Unit	Syllabus	Lectures
Unit 1	Solar Photovoltaics P-N junction under illumination, Light generated current, I-V equation, Characteristics, Upper limits of cell parameters, losses in solar cells, equivalent circuit, effects of various parameters on efficiency, Solar cell design, Design for high Isc, Antireflective coating (ARC), Design for high Voc and fill factor, Analytical techniques; solar simulator, Quantum efficiency, Minority carrier life time and diffusion length measurement. Thin film solar cells: Advantages, materials, a-Si, CdTe, CIGS	15
Unit 2	Dye and Quantum Dot Sensitized Solar Cell Dye sensitized solar cells: - Operation, Materials and their properties, Advantages and Disadvantages Quantum dot sensitized solar cells: - What is quantum dot? Tuning the electronic properties of Quantum dot, Operation, Materials and their properties, Advantages and Disadvantages	15
Unit 3	Perovskite and Organic Solar cell Perovskite sensitized solar cells: - Crystal Structure and Related Properties, Opto-electronic Properties, Device Structures, operation and Performances Organic Photovoltaic Materials: - Organic Photovoltaic Materials properties, Principles of Operation and Device Concepts, Stability and Performance	15
Unit 4	Supercapacitors and Batteries Supercapacitor: Comparison between capacitor, supercapacitor and battery; Capacitor principle, Types of capacitors; Electrochemical capacitor: Introduction, Ragone plot, Charge-discharge of supercapacitor and battery; Electric double layer capacitor: electrode-electrolyte interfaces (models), construction, advantages and disadvantages; pseudo capacitor: electrochemical pseudo capacitor of electrode-electrolyte interface; electrochemistry of pseudo capacitor: underpotential, Redox, Intercalation; Electrode material, Ruthenium oxide. Introduction to Li- Ion battery, Introduction to fuel cell.	15

References:

1. Solar photovoltaics, Fundamentals, Technologies and Applications by Chetan Singh Solanki, PHI Learning Private Limited, Delhi-110092.
2. Dye Sensitized Solar Cells by K. Kalyansundaram, EPFL Press, A Swiss academic publisher distributed by CRC press.
3. Quantum dot solar cells. Semiconductor nanocrystals as light harvesters, PV Kamat, The Journal of Physical Chemistry C 112 (48), 18737-18753
4. Photovoltaic Solar Energy: From Fundamentals to Applications by Editors(s): Angèle Reinders, Pierre Verlinden, Wilfried van Sark, Alexandre Freundlich, John Wiley & Sons, Ltd
5. Clean Electricity from Photovoltaics: Second Edition by Mary D Archer, Martin

GreenImperial College Press Syllabus for M. Sc (Physics) Choice Base Credit System

6. Advanced Concepts in Photovoltaics by Arthur J Nozik, Gavin Conibeer and Matthew C Beard, RSC Energy and Environment Series
7. Practical Handbook of Photovoltaics: Fundamentals and Applications by AugustinMcEvoy, Tom Markvart and Luis Castaner. Academic Press
8. Electrochemicalsupercapacitors forenergy storageand deliveryfundamentals and applicationsby Aipingyu, victor Chabot and jiujunzhang.
9. Electrochemical Supercapacitors, Scientific fundamentals and Technological Applications by B. E. Conway, Kluwer Academic/ Plenum Publishers, New York, Boston, Dordrecht, London, Moscow
10. https://batteryuniversity.com/learn/article/lithium_based_batteries BU-204
11. Battery reference book 3rd edition by T. R. Crompton
12. Battery Technology Handbook by H. A. Kiehne , Marcel Dekker, Inc. , New York, Basel.
13. Fuel cell handbook &th edition by E G and G technical services.Inc.

M. Sc. II Semester IV
Course Code: CPPR- 1122D
Paper title: Physics LAB-III
Total Credits: 4-credits
Laboratory/ Practical Course-II
Solid State Physics Lab –II

Practicals: Sem IV

1. Thermoelectric power of thin film
2. Contact angle measurement of thin film
3. Determination of band gap energy of thin film
4. Measurement of dielectric constant
5. Rietveld method of structure refinement
6. Calculation of XRD peak positions and intensities
7. Thickness measurement of thin film
8. Electrical resistivity of thin film by 2 probe method
9. EXAFS analysis of thin film
10. Raman analysis of thin film
11. IR analysis of thin film

CPPR-1123D (Practical Lab-IV)

4 Credit

Seminar +Tutorials on practical Course-II

Nature of Question Paper

Theory: Time -3 hours, Marks-80

Instructions: All questions are compulsory.

Q.1 Select Correct Alternative

(8)

1.
A) B) C) D)
2.
B) B) C) D)
3.
C) B) C) D)
4.
D) B) C) D)
5.
E) B) C) D)
6.
F) B) C) D)
7.
G) B) C) D)
8.
H) B) C) D)

Q.2 Attempt any four

(48)

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....

Q. 3 Attempt any four

(24)

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....

SCHEME OF MARKING (THEORY)

Sem.	Paper No.	DSC	Marks	Evaluation	Answer Books	Standard of passing
III	I	CC-1112C	80	Semesterwise	As per Instruction	40% (32 marks)
III	II	CC-1113C	80	Semesterwise	As per Instruction	40% (32 marks)
III	III	CC-1114C	80	Semesterwise	As per Instruction	40% (32 marks)
III	IV	CC-1115C	80	Semesterwise	As per Instruction	40% (32 marks)
IV	I	CC-1118D	80	Semesterwise	As per Instruction	40% (32 marks)
IV	II	CC-1119D	80	Semesterwise	As per Instruction	40% (32 marks)
IV	III	CC-1120D	80	Semesterwise	As per Instruction	40% (32 marks)
IV	IV	CC-1121D	80	Semesterwise	As per Instruction	40% (32 marks)

SCHEME OF MARKING (CIE) Continuous Internal Evaluation

Sem.	Paper No.	DSC	Marks	Evaluation	Answer Books	Standard of passing
III	I	CC-1112C	20	Semesterwise	As per Instruction	40% (8 marks)
III	II	CC-1113C	20	Semesterwise	As per Instruction	40% (8 marks)
III	III	CC-1114C	20	Semesterwise	As per Instruction	40% (8 marks)
III	IV	CC-1115C	20	Semesterwise	As per Instruction	40% (8 marks)
IV	I	CC-1118C	20	Semesterwise	As per Instruction	40% (8 marks)
IV	II	CC-1119C	20	Semesterwise	As per Instruction	40% (8 marks)
IV	III	CC-1120C	20	Semesterwise	As per Instruction	40% (8 marks)
IV	IV	CC-1121C	20	Semesterwise	As per Instruction	40% (8 marks)

SCHEME OF MARKING (PRACTICAL)

Sem.	DSC	Marks	Evaluation	Sections	Standard of passing
CCPR-1116C (Practical Lab-I)	Laboratory/ Practical Course-I	100	Semester wise	As per Instruction	40% (40 marks)
CCPR-1117C (Practical Lab-II)	Tutorial I + Research project	100	Semester wise	As per Instruction	40% (40 marks)
CCPR-1122C (Practical Lab-III)	Laboratory/ Practical Course-II	100	Semester wise	As per Instruction	40% (40 marks)
CCPR-1123C (Practical Lab-IV)	Tutorial II+ Research project	100	Semester wise	As per Instruction	40% (40 marks)

VIVEKANAND COLLEGE, KOLHAPUR

(AUTONOMOUS COLLEGE)

Department of Foundry Technology

Board of Studies in Foundry Technology

Syllabus

For

M. Voc. in Foundry Technology

(To be implemented from Academic Year 2020-2021 onwards)

MASTER OF VOCATION (M. Voc.)

STRUCTURE OF SYLLABUS:

To be implemented from the academic year 2020-2021

1. Title of the course: Post-Graduate Diploma in Foundry Technology

A. INTRODUCTION

The proposed curriculum is with the view to make it more contextual, industry affable and suitable to cater the needs of society and nation in present day context. The committee examined the nature of the existing syllabus of various courses in foundry technology and after analysing other curricula of existing universities in respective subjects in terms of content, relevance, quality and pattern of teaching and examination, has synthesized the present proposal. After guidance from industry professionals, consultants and senior faculty, feedbacks from the core faculty and intensive discussions the syllabus is suitably finalized.

The syllabus needs revision in terms of preparing the student for the professional scenario with relevance to practical needs and requirements. A holistic approach includes providing industry training via on job training/internships, handling live projects, visits to foundry units. Regular expert's interaction will help to build a bridge between students and industry.

Technical advancement is the key to a substantial teaching system in today's world and thus a great responsibility lies on the curriculum to prepare students to rise to meet global standards and align seamlessly to changing trends.

B. RATIONALE

Casting process is an art and need to be developed to fulfil the requirement of the global market. The skill of casting will provide us the better quality of automobile, aeronautical agricultural and heavy engineering cast components. In recent days, Foundry sectors are lacking skilled employees in Quality control, Simulation and overall Management. This curricular area aims at enabling the students to develop their skills of these different foundry sections.

In today's world of competition, the rejection control has become the key factor in the foundry industry. Rejection control benefits the industry in both quality and profit. This control is not possible without skilled employees present in the industry, which makes this course important for the industry.

The Foundry Technology curriculum focuses on building a strong foundation and managerial skills for developing a career in foundry by learning the basic key factors and advanced tools in Quality, Simulation, Pattern making, Production, Melting and Fettling. Practical orientation of this course strengthens the skills of students and makes them solving the problems of foundry industry.

C. COURSE OBJECTIVES

To enable the students-

- To promote understanding of advance facts and concepts in foundry process while retaining the excitement of foundry industry.
- To make students capable of studying foundry technology in academic and Industrial courses.
- To expose the students to various emerging new areas of foundry technology and apprise them with their prevalent in their future studies and their applications in various spheres of manufacturing technology.
- To develop problem solving skills in students.
- To expose the students to different processes used in Foundry Industries and their applications.
- To develop ability and to acquire the skill and knowledge of terms, facts, concepts, processes, techniques and principles of foundry industries.
- To develop ability to apply the skill and knowledge of contents of principles of foundry technology.
- To inquire of new skill and knowledge of foundry technology and developments therein.
- To expose and to develop interest in the fields of foundry technology.

D. CORE CONTENT GOALS FOR FOUNDRY TECHNOLOGY

The students will learn:

1. Research Methodology
2. Advances in Engineering Materials
3. Behavior of material under mechanical load
4. Non-ferrous casting production techniques
5. Work study and Work measurement
6. Quality control and Assurance
7. Entrepreneurship Development and Human Resource development
8. Costing and Cost control
9. Non Destructive testing
10. Foundry Automation and Safety
11. Casting Simulation
12. About career options in foundry industry.
13. Improve their skills and techniques through practical and projects.
14. Problem solving techniques.

In this class, students will learn the advance theory behind all the foundry operations. The Practical part of course will make them confident to work on shop floor as well as at

managerial level. They will demonstrate the processes as expected by the teacher. They are expected to maintain facilities in an appropriate working condition.

2. Duration:

The duration of the M. Voc. Course will be of **Two years**.

M. Voc. Part I - Post- Graduate Diploma in Foundry Technology

M. Voc. Part II - M. Voc in Foundry Technology

The final M. Voc degree will be awarded only after completion of two years course. The suggested credits for each of the years are as follows:

Awards		Normal calendar duration	Skill Component Credits (Theory)	Skill Component Credits (Practical)
Year 1	Post Graduate Diploma in Foundry Technology	Two Semesters	36	24
Year 2	M. Voc in Foundry Technology	Two Semesters	-	60
TOTAL			36	84

General Education Component should not exceed 40% of the total curriculum.

Credits can be defined as the workload of a student in

1. Lectures
2. Practicals
3. Seminars
4. Private work in the Library/home
5. Examination
6. Other assessment activities.

The following formula should be used for conversion of time into credit hours.

- a) One Credit would mean equivalent of 15 periods of 50 minutes each, for theory, workshops /labs and tutorials;
- b) For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops;
- c) For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

3. Eligibility:

The eligibility condition for admission to M. Voc. programme shall be

B. Voc in Foundry Technology from any recognized board or university.

BE/B.Tech in Mechanical/Production/Metallurgy from any recognized board or university.

4. Medium of Instruction:

The medium of instruction of the course will be **Marathi/English**.

5. Pattern: Choice Based Credit System with Course Outcomes.

6. Examination:

A. Scheme of examination:

- The semester examination will be conducted at the end of each term (both theory and practical examination)
- Theory paper will be of 50 marks each. The practical examination will be of 150 marks and seminar of 50 marks..
- Question papers will be set in the view of the entire syllabus and preferably covering each unit of the syllabus.
- For each semester there will be five theory papers. Practical Examination will be conducted at the end of every semester.

Paper Number	Title of Paper (For Semester I)	Internal Marks	Theory Exam Marks	Total Marks
I	Design of Experiment and Research Methodology	10	40	50
II	Concepts in Material Science	10	40	50
II	Advances in Iron and Steel Making	10	40	50
IV	Mechanical Behaviour of Materials	10	40	50
V	Elective I	10	40	50
TOTAL		50	200	250

Paper Number	Title of Paper (For Semester II)	Internal Marks	Theory Exam Marks	Total Marks
VI	High Pressure Die Casting	10	40	50
VII	Industrial Engineering	10	40	50
VIII	Total Quality Management	10	40	50
IX	Entrepreneurship Development	10	40	50
X	Elective II	10	40	50
TOTAL		50	200	250

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	120	Seminar	50
2	Journal	15		
3	Oral	15		
Total		150		50

The total weightage of first term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 40 X 5	200
2	Theory Internal	50
3	Practical Examination.	150
4	Seminar	50
	TOTAL	450

B. Nature of question paper:

For each paper there will be **THREE** compulsory questions.

General nature of the question paper will be:

Question Number	Type		Marks
Q.1	Multiple choice question	No internal options.	8
Q.2	Short answer	Any four out of six	16
Q.3	Long answer	Any two out of three	16

C. Standard of Passing:

To pass the examination a candidate must obtain at least 40% (i.e 16 marks out of 40) in individual subjects, in internal assessment and University examination each in all theory and practical subjects.

D. External Students: Not applicable as this is a practical oriented course.

7. University Terms: As per academic calendar of the Vivekanand (Autonomous) college.

For the first year i.e. Post-Graduate Diploma in Foundry Technology practical examination and theory paper assessment will be done at college level.

8. List of equipment and instruments:

1. Liquid penetrant testing kit
2. Magnetic particle testing kit
3. Ultrasonic testing equipments
4. Radiography testing (Radiographs)
5. Microstructure using replica method
6. UTM
7. Computer lab with simulation software

9. Laboratory Safety Equipments:

Part I: Personal Precautions:

1. Must wear Lab Aprons and safety shoes.
2. Except in emergency, over – hurried activities is forbidden.
3. Eating, Drinking and Smoking in the laboratories is strictly forbidden.

Part II: Use of Safety and Emergency Equipments:

1. First aid Kits

2. Fire extinguishers (dry chemical and carbon dioxide extinguishers)
3. Management of Local exhaust systems.
4. Sign in register if using instruments.

10. Workload:

Each skill based paper will have five **theory** periods per week. There are five **practical** per week. Each practical will be of three periods.

The total workload:

1. Five Papers on skill based Education: 5 X 4	=	20 Theory Periods.
2. Five Practical work per week: 5 X 3	=	15 Practical periods.
3. Project Work per batch per week:	=	05 Periods
TOTAL		40 Periods.

Working hours will be 5 hours (300 minutes) per day i.e. six periods each of 50 minutes.

13. MEMORANDUM OF UNDERSTANDING (MOU):

The purpose of this MOU is to clearly identify the roles and responsibilities of each party (i.e. college and industry partner) as they relate to the implementation of the **M .Voc. Programme in Foundry Technology** at the college.

It is suggested to sign at least **TWO MOU** with the industry partners in the related field.

14. Program Outcomes:

1. Acquire in-depth knowledge of Materials so as to develop an ability to discriminate, evaluate, analyze and synthesize existing and futuristic needs in global perspective towards improvement of materials.
2. Critically analyze complex engineering problems related to Materials and apply independent judgment for synthesizing information to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy context.
3. Think laterally and originally, conceptualize and solve engineering problems related to Materials to evaluate a wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering public health and safety, cultural, societal and environmental factors in the core areas of expertise.
4. Acquire professional and intellectual integrity, professional code of conduct, ethics of research, consideration of the impact of research outcomes on professional practices and an understanding of responsibility to contribute to the community for sustainable development of society.
5. Apply various advanced software skills and Quality tools to model, analyze and solve problems related to foundry and related filed.

6. Demonstrate high level of professional and intellectual integrity, ethics of research and scholarly standards to promote entrepreneurship.
7. Effectively communicate through technical reports, presentations and scientific publications with the technical and engineering community as well as society at large.
8. Demonstrate the ability to work in team in the laboratory in achieving multidisciplinary tasks required for the project.

15. Program Educational Outcomes:

1. To train the students for successful careers in metallurgical and manufacturing industry, academics, in the field of research and development that meet the needs of Indian and multinational companies, R&D organizations and also prepare them for higher studies.
2. To prepare the students to exhibit a high level of professionalism, integrity, effective communication skills and environmental and social responsibility.
3. To inculcate in student's leadership qualities, techno-economical considerations, an aptitude for life-long learning, and introduce in them the professional ethics and codes.

16. Program Specific Outcomes:

1. Students from Foundry Technology will collect and analyze data for solving the problems related with casting by using modelling, analysis & quality tools.
2. Student will make use of advance material testing techniques, gating design and casting simulation for improving quality of product.

Syllabus with credits

Level	Semester	Subjects	Credits
Level 8	Semester I	1. Design of Experiment and Research Methodology	3
		2. Concepts in Material Science	3
		3. Advances in Iron and Steel Making	3
		4. Mechanical Behaviour of Materials	3
		5. Elective I	3
		Metal Testing Lab	12
		Seminar I	3
	Semester II	1. High Pressure Die Casting	3
		2. Industrial Engineering	3
		3. Total Quality Management	3
		4. Entrepreneurship Development	3
		5. Elective II	3
		CAD and Simulation Lab	12
Level 9	Semester III	Industrial Training and Report	16
		Seminar III	3
		Dissertation Phase I	11
	Semester IV	Dissertation Phase II	30

Elective I	Elective II
Non-Destructive Testing	Human Resource Management
Advanced Composites and Polymers	Production and Operation Management
Nano Materials and Nano Technology	Costing and Cost control
Foundry Automation and Safety	Quality management system

M. VOC IN FOUNDRY TECHNOLOGY

SEMESTER I

SKILLED BASED PAPERS:

PAPER-I: DESIGN OF EXPERIMENT AND RESEARCH METHODOLOGY

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basics of Data analysis for research
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):		Mapping with PO's
Upon completion of this course, students will be able to		
CO1	Understand the importance of research design and sampling.	7
CO2	Analyze the data collected measure the same.	7
CO3	Construct a hypothesis and analyse it with different tools.	7
CO4	Understand the importance of report writing.	7

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1							2			1
CO2							2			1
CO3							2			1

CO4							2			1
-----	--	--	--	--	--	--	---	--	--	---

Course content:

1. Introduction: Meaning and objectives of research, Types of research, Research approaches, Research process, Research problem, Selection of research problem, Defining research problem, Literature review, Meta-analysis, Effect sizes, Integrating research findings, Identification of research gaps, Errors in research.

2. Research Design: Meaning, need, and features of good design, Dependent, independent, and extraneous variables, Experimental and control groups, Treatments, Experiment, Research designs in exploratory studies, Research designs in descriptive studies, Experimental research designs (informal and formal), Replication, Randomization, Blocking

3. Sampling: Need for sampling, Population, Sample, Normal distribution, Steps in sampling, External validity and threats, Sampling error, Probability sampling, Random sampling, Systematic sampling, Stratified sampling, Cluster sampling, Student's distribution, Standard error, Determination of sample size

4. Measurement Techniques: Measurement scales, Errors in measurement, Content validity, Criterion-related validity, Construct validity (convergent and discriminant), Reliability, Rating scales, Paired comparison, Differential scales, Summated scales, Cumulative scales, Factor scales

5. Data Collection and Analysis: Primary data collection through observations and interviews, Questionnaire surveys, Secondary data collection, Data processing, Measures of central tendency and dispersion, mean, median, mode, range, variance, standard deviation, inter-quartile range, histogram, box-plot, normal probability plot, Measures of association (simple regression analysis, association of attributes) (Use Minitab software)

6. Hypothesis Testing: Null and alternative hypothesis, Level of significance, Type I and type II error, Two-tailed and one-tailed tests, Procedure of hypothesis testing, Power of hypothesis test, Hypothesis testing of means, Hypothesis testing of mean difference

7. Analysis of Variance: Introduction, One-way ANOVA, Two-way ANOVA, Preparation of ANOVA Table and calculation of F-ratio

8. Report Writing: Interpretation of results, Techniques and precaution in interpretation, Steps in report writing, Layout of research report, Types of research report, Mechanics and precautions in writing research report, Structure of research paper, Referencing and bibliographic styles, Citations, Impact factor, Peer review, Plagiarism

Test books/ Reference Books:

1. Montgomery, Douglas C. (2007) – Design & Analysis of Experiments, 5/e. (New Delhi, Wiley Student Edition, Wiley India Pvt. Ltd.) ISBN: 978-81-265-1048-1

2. Montgomery, Douglas C. & Runger, George C. (2007) – Applied Statistics & Probability for Engineers, 3/e, . (New Delhi, Wiley Student Edition, Wiley India Pvt. Ltd.), ISBN: 978-81-265-1424-3

3. Ranjit Kumar, (2006), Research Methodology- A Step-By-Step Guide for Beginners, (Pearson Education, Delhi) ISBN: 81-317-0496-3
4. Trochim, William M.K., (2003), 2/e, Research Methods, (Biztantra, Dreamtech Press, New Delhi), ISBN: 81-7722-372-0
5. Kothari, C.K., (2004), 2/e, Research Methodology- Methods and Techniques, (New Age International, New Delhi)
6. Krishnaswamy, K. N., Sivakumar, Appa Iyer and Mathirajan, M. (2006), Management Research Methodology: Integration of Principles, Methods and Techniques (Pearson Education, New Delhi)
7. Panneerselvam – Research Methodology, (PHI), ISBN: 81-203-2452-8

PAPER-II: CONCEPTS IN MATERIAL SCIENCE

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic information related to materials
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs): Upon completion of this course, students will be able to		Mapping with PO's
CO1	Understand basics of the structure- properties relationship.	1,2
CO2	Understand importance of phase diagrams in micro structure design.	1,2
CO3	Analyze, interpret and solve scientific materials data/ problems.	1,2
CO4	Apply principles of heat treatments of steels.	1,2

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2							3	
CO2	3	2							3	
CO3	3	2							3	

CO4	2	1							3	
-----	---	---	--	--	--	--	--	--	---	--

Course content:

1. Introduction to engineering materials & their properties. Crystalline versus non crystalline solids, Unit cell, Crystal systems, Bravais lattice, Fundamental reasons behind classification of lattice, Miller indices for directions & planes, Close-packed planes & directions, packing efficiency, Interstitial voids, Role of X-ray diffraction in determining crystal structures.
2. Deformation of metals, Understanding of some material-properties independent of inter atomic bonding forces/energies, Stiffness versus modulus, Theoretical/ideal strength versus actual strength of metals, Crystal defects, Role of dislocations in deformation, Strengthening Mechanisms, Role of Cottrell atmosphere.
3. Objectives & classification, System, Phases & structural constituent of phase diagram. Temperature–Pressure phase diagram of iron & Clausius – Clapeyron equation for boundary between phase regions of temperature-versus-pressure phase diagrams, Gibbs phase rule, Lever rule, Solid solutions, Hume-Rothery rules, Isomorphous, Eutectic, Peritectic & Eutectoid system, Equilibrium diagrams for non-ferrous alloys.
4. Experimental methods of determining phase diagrams, Iron–Carbon equilibrium diagram, Steels & Cast-irons. Gibbs free-energy curves for pure system, Solidification of pure metals, Nucleation, Growth, Growth of the new phase, Solidification of alloys, Nucleation-, growth- & overall transformation- rates, TTT & CCT diagrams.
5. Definition, Purpose & classification of heat treatment processes for various types of steels, Bainite&Martensite formation, Introduction & applications of various case hardening & surface hardening treatments, Precipitation Hardening, Heat treatment defects.

Test books/ Reference Books:

1. V. Raghvan, Materials Science and Engineering, Prentice Hall of India Publishing 5th Edition, 2006.
2. Asklund&Phule, Material Science & Engineering of materials 4th Edition.
3. Reed Hill, Physical Metallurgy 4th Edition, 2009.
4. S.H. Avner, Introduction to Physical Metallurgy 2nd Edition, 1974.
5. W.D. Callister, Materials Science and Engineering 8th Edition, 2006.
6. D.A. Porter & K.E. Easterling, Phase Transformations in Metals & Alloys 3rd Edition, 1992.

PAPER-III: ADVANCES IN IRON AND STEEL MAKING

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basics of Iron and Steel
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours

Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--
---	-------------

Course Outcomes (COs):		Mapping with PO's
Upon completion of this course, students will be able to		
CO1	Design alloy chemistry for manufacturing /procurement of desired composition of the steel as per the specification.	2
CO2	Decide raw materials quality and sequence of refining for making clean steel.	2
CO3	Control the cost of the steel by careful selection of the raw materials and other necessary ingredients required for steel manufacturing.	2
CO4	Understand metallurgical benefits of ingot and continuous cast products.	2
CO5	Devise ways for energy conservation and environmental pollution.	2

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1		2							2	1
CO2		2							2	1
CO3		2							2	1
CO4		2							2	1
CO5		2							2	1

Course content:

1. Raw Materials for Steel making, Refractories, Scrap, Fluxes, Sponge Iron production, Electric Furnace Steel Making, Construction, Operation, Transformer Rating, Primary and Secondary Circuit, Power Factor, Thermal efficiency of the furnace.
2. Ladle Metallurgy: Construction and Operation of LRF, Principle of Steel making and Refining Technology, Gases removal, Deoxidation of Steel and Non-Metallic inclusions, Role of Slag Composition on Quality of Steel, Processes-AOD, VOD& VD.
3. Continuous Casting M/Cs: Operation and Construction, bloom, Billet, Slab and Thin strip Caster, primary and Secondary Cooling, Process parameters of the caster. Ingot Casting: Types of Moulds.
4. Defects in Cast Product, Electromagnetic Stirring (EMS) for Quality improvement, Types of EMS, Selection Advantages, and Disadvantages. Dust generation from Furnaces and environmental impacts

Test books/ Reference Books:

1. Steel Making –V. Kudrin, Mir. Publisher

2. Introduction to Modern Steel Making- Dr.R.H.Tupkari, Khanna Publishers
3. Electrometallurgy-I - By Edneral
4. Continuous Casting Vol-III - J.J.Moore
5. Continuous Casting of Steel – By Irving W.R.,
6. Electric Furnace Steel Making (Vol I & III) Higgins.

PAPER-IV: MECHANICAL BEHAVIOUR OF MATERIALS

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge about mechanical properties of materials
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):		Mapping with PO's
Upon completion of this course, students will be able to		
CO1	Analyze mechanical deformation of the materials using analytical treatment.	3
CO2	Use mechanical metallurgical concepts in understanding mechanical deformation.	3
CO3	Identify failure modes and reasons of failures of engineering components.	3
CO4	Incorporate fracture mechanics concepts in the mechanical design.	3
CO5	Use micro structural principles for the design of fracture and creep resistant materials.	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1			2						2	
CO2			2						2	
CO3			2						2	
CO4			2						2	
CO5			2						2	

Course content:

1. Mechanical properties of materials, Theory of plasticity: The flow curve, yielding criteria for ductile metals, Plastic deformation of single crystal and polycrystalline materials, Deformation by slips, Deformation by twinning, strain hardening of single crystals.
2. Dislocation theory: Dislocations in FCC, HCP and BCC lattice, forces on dislocations, forces between dislocations, dislocation climb, intersection of dislocations, Jogs, multiplication of dislocations, dislocation pile-ups.
3. Strengthening mechanisms: Strengthening of grain boundaries, yield point phenomenon, strain aging, solid solution strengthening, strengthening from fine particles, fiber strengthening, martensitic strengthening.
4. Fracture mechanics and fracture toughness evaluation: Strain energy release rate, stress intensity factor, fracture toughness and design, KIC Plain-strain toughness testing, crack opening displacement, probabilistic aspects of fracture mechanics, and toughness of materials.
5. Fatigue of metals: Stress cycles, S-N curve, statistical nature of fatigue, low cycle fatigue, structural features of fatigue, fatigue crack propagation, effect of stress concentration on fatigue, size effect, surface effects and fatigue, effect of metallurgical variables on fatigue, corrosion fatigue, effect of temperature on fatigue.
6. Creep and Stress rupture: High temperature materials problem, time dependent mechanical behavior, creep curve, stress rupture, structural changes during creep, mechanisms of creep deformation, deformation mechanism maps, fracture at elevated temperature, high temperature alloys and Fractography - important aspects.

Test books/ Reference Books:

1. Mechanical Metallurgy– Geroge E. Dieter, SI Metric Edition, 1988, McGraw Hill Book Co Ltd, U.K.
2. Mechanical Behaviour of Materials, Marc Andre Meyers and KishanKumarChawala, Second Edition, 2009, Cambridge University Press, U.K.
3. The Indian Academy of Sciences Proceedings: Engineering Science – Alloy Design, Vol 3 Part 4, December 1980 and Vol 4 / Part 1, April 1981, Published by The Indian Academy of Sciences, Bangalore- 560080.
4. Dislocations and Mechanical Behaviour of Materials, M.N. Shetty, 2013, PHI Learning Pvt Ltd, New Delhi -110092.
5. C. Wagnev, Thermodynamics of alloys, Addison Wesley, Cambridge, 1952.
6. F. D. Richardson, Physical Chemistry of Melts in Metallurgy, Academic, N. Y., 1974.

SEMESTER II**PAPER-V: HIGH PRESSURE DIE CASTING**

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge about different non-ferrous

	casting processes	
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours	
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours	
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--	
Course Outcomes (COs): Upon completion of this course, students will be able to		Mapping with PO's
CO1	Establish correlation between process parameters to resultant die casting.	5
CO2	Solve numerical problems related to die casting design.	5
CO3	Understand concepts and process capabilities of casting	5
CO4	Know pre-treatment and post heat treatments of die castings	5
CO5	Understand die casting defects and their remedial measures.	5

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1					2				2	2
CO2					2				2	2
CO3					2				2	2
CO4					2				2	2
CO5					2				2	2

Course content:

1. Introduction. Evolution of die-casting processes. Permanent mold casting. Die-casting of low melting metals and alloys, Zinc and lead alloys. Die-casting of aluminum alloys. Hot-chamber and cold-chamber pressure die casting methods. Low pressures die casting developments. General advantages and limitations of high-pressure die-casting methods.
2. High pressure die-casting machines. Plate type and toggle type machines. Range of pressures and capacities of HPDC machines. PQ2 analysis of machine capacity. Basic process and pressure-time cycles. Hydraulic systems. General control systems in HPDC machines.
3. Alloys for HPDC method. Zinc alloys. Aluminum alloys. Alloys with short and long melting temperature ranges. Hot shortness and related solidification problems. Common Aluminum die-casting alloys. Magnesium and Aluminum-magnesium alloys.
4. Melting methods and melt quality problems in aluminum alloys, charge calculation for alloy preparation, raw materials, quality, cost of production and energy consumption Scrap, ingots, master alloys, degassing agents and other additives. Gas content measurement. Densitometry for casting quality. Analytical methods for routine heat quality records. Basic

factors in the process of solidification in metallic molds. Solidification: Controlled solidification, Microstructure Development, etc., Inspection/Quality Check: mechanical/ Microstructural/ physical/ Chemical properties, NDT, etc

5. Dies for High pressure die-casting processes. Common alloys for HPDC dies and their heat-treatment. CAD systems for HPDC die design. Provision of cooling channels, inserts and supports in die-design. Die-coats and die-casting consumables.

6. High Integrity Die Castings. Advanced methods for high integrity and quality aluminum pressure die-castings. Squeeze casting, Semi-solid casting methods, Rheo-casting, vacuum die casting systems.

Test books/ Reference Books:

1. Degarmo, E. Paul; Black, J T.; Kohser, Ronald A. (2003), Materials and Processes in Manufacturing (9th ed.), Wiley, ISBN 0-471-65653-4.
2. Andresen, Bill (2005), Die Casting Engineering, New York: Marcel Dekker, ISBN 978-0-8247-5935-3.
3. Alan Kaye and Arthur Street , Die Casting Metallurgy, Butter worths Monographs in Materials, 1982.
4. Davis, J. (1995), Tool Materials, Materials Park: ASM International, ISBN 978-0-87170-545-7.
5. ASM Metals Handbook, 9th Edition, Vol 15: Casting , 2008 , Metals Park, Ohio, U.S,A.
6. Brevick, Jerald; Mount-Campbell, Clark; Mobley, Carroll , 2004 , Energy Consumption of Die Casting Operations (PDF), Ohio State University.
7. North American Die Casting Association, Arlington Heights, Illinois IL 60004, USA.: Publications and Handbooks, 2015

PAPER-VI: INDUSTRIAL ENGINEERING

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basics about Productivity and work study
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):		Mapping with PO's
Upon completion of this course, students will be able to		
CO1	Demonstrate interdisciplinary knowledge of method study, work measurement techniques and ergonomics for the overall improvement of productivity and effectiveness.	8

CO2	Demonstrate an interdisciplinary knowledge of method study, work measurement techniques and ergonomics for the overall improvement of productivity and effectiveness.	8
------------	---	---

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1								2	2	
CO2								2	2	

Course content:

1. Introduction to Productivity and Work Study: Definition and scope, Productivity and quality of life, Evolution of work study, contribution of Taylor and Gilbreth, Work study techniques and basic procedure, Human factor in application of work-study. Method study: a) Definition, objectives and basic procedure. b) Record, Examine, Develop – Process chart symbols, Outline and flow process charts, Flow diagrams, Critically Examine Techniques c) Movement of workers and material – string diagram, flow process charts worker Material and equipment type, multiple activity chart – Man – Machine, Machine- Machine chart, Travel charts for workplace d) Methods and Movements at workplace- Principles of motion economy, Classification of movements, Two handed process chart, SIMO chart, Micro Motion study, Therbligs. e) Evaluate, Define, Install and Maintain methods.

2. Working conditions and Environment: Occupational hazards, health and safety, housekeeping, lighting, noise and vibrations, climatic conditions, ILO norms Ergonomics: Human factor engineering, man- machine interaction, Design of controls, environment factors, Anthropometry, workplace design.

3. Value Engineering: Introduction, Concept, Difference between Value Engineering and Value Analysis, Case study.

4. Work Measurement: Definition, objectives, basic procedure, Techniques of work measurement, Time study – Equipment and forms, selection of a job, steps in time study, breaking the job into elements, timing the elements; Rating in time study – standard rating and standard performance, factors affecting rate of working, standard time determination, use of time standards, allowances; Work sampling – Need, procedure for work sampling, determining time standard by work sampling. Predetermined time standards (PTS) – definition, methods time measurement (MTM) standard data from PTS, introduction, Methodology.

5. Location Layout: Factors affecting site selection, factors affecting layout design, types of layout, systematic layout planning procedure, travel chart, information gathering, flow analysis and activity analysis relationship diagram, space requirement and availability, designing of layout – use of CAD; Material Handling Systems– Principles, functions and equipments, selection of MH systems, unit load concept in MH, Economics of material handling.

6. Job Evaluations and Merit Rating: Job analysis, Ranking system, Grade description system, Point system, Factor comparison system; Method of merit rating systems, Incentives: Types of Incentives, Relationship of motion and time study with the incentives.

Test books/ Reference Books:

1. Work Study: - I L O
2. Work Study: - Curie and Faraday (ELBS)
3. Industrial Engineering Handbook, Maynard (Mc Graw Hill)
4. Time and Motion Study Design, Barnes, R.M. (John Wiley)
5. Work Study & Ergonomics, L.C. Jhamb (Everest)
6. Facility Layout and Location – An Analytical Approach, Francis et. al.(PHI)
7. Facilities Planning – 3/e, Tompkins, White, Bozer, Tanchoco (John Wiley & Sons)
8. Job Evaluation - ILO
9. Payment by Results, - ILO
10. Work Study by O.P. Khanna (Dhanapat Rai and Sons)

PAPER-VII: TOTAL QUALITY MANAGEMENT

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge about quality
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):		Mapping with PO's
Upon completion of this course, students will be able to		
CO1	Understand the concepts in TQM.	5
CO2	Implement quality tools towards Quality improvement	5
CO3	Understand the structure and functions of quality council in order to drive TQM implementation	5

CO4	Setting direction for TQM efforts, creating vision, mission, quality policy and establishing strategic objectives	5
------------	---	---

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1					3				3	
CO2					3				3	
CO3					3				3	
CO4					3				3	

Course content:

1. Basic concepts, need for TQM, principles of TQM, Quality philosophies of Deming, Crosby, Juran, Ishikawa and Feigenbaum, TQM models.
2. Quality policy deployment, quality function deployment, voice of customer, quality planning.
3. QC tools, problem solving methodologies, new management tools, quality circles, quality costs, prevention and appraisal costs, failure costs, models to minimize failure costs, benchmarking.
4. KAIZEN, 5S, JIT, POKAYOKE, Taguchi methods: Introduction to parameter and tolerance design, Six Sigma
5. Steps in TQM implementation, national and international quality awards, case studies.

Test books/ Reference Books:

1. Dale H. Besterfield, "Total Quality Management", Pearson Education Asia
2. Rose, J.E. Total Quality Management, Kogan Page Ltd. 1993.
3. John Bank, The essence of total quality management, Prentice Hall, 1993.
4. Greg Bounds and Lyle Yorks, Beyond Total Quality Management, McGraw Hill, 1994.
5. Masaki Imami, KAIZEN, McGraw Hill, 1986.
6. Phil Crosby, Quality Without Tears, McGraw Hill
7. Six Sigma: Hemant Urdhwareshe.

PAPER-VIII: ENTREPRENEURSHIP DEVELOPMENT

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Knowledge about entrepreneurship
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours

Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs): Upon completion of this course, students will be able to		Mapping with PO's
CO1	Understand traits in entrepreneurship	4
CO2	Understand the role of small scale industries in Indian economy.	4
CO3	Create a feasibility report for business	4
CO4	Create Business plan and prepare project report.	4

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1				2						1
CO2				2						1
CO3				2						1
CO4				2						1

Course content:

1. Entrepreneurship: Definition of Entrepreneur and Entrepreneurship, entrepreneurial Process, Entrepreneurship and economic development, job creation, Indian scene.
2. Small Scale Units: Concept and definition, role of S.S.I. in Indian economy, Government policies and facilities.
3. Planning Small Scale Business: Business opportunity identification, idea generation, ideas from marketplace, market assessment, demand estimation.
4. Government Support Organizations: Central Government, State government, c) Financial support organizations, d) Government schemes and procedures.
5. Entrepreneurial Motivation: Self-disclosure, personality effectiveness, risk taking, Entrepreneurial competencies, case studies.
6. Business plan preparation: Meaning of business plan, project parameters, Information sources of economical and technical knowhow, selection of location, identification of raw material, suppliers, plants/machinery, process, manpower and other inputs such as power, water etc.
7. Small Business Management: Techniques of marketing, materials, production, Manpower and financial management, crisis management, working capital management, Fixed capital assessment, cash flow analysis, ROI, techniques of decision making.
8. Statutory Requirements: Factories Act 1948, Industrial disputes Act 1947, Indian Contract Act, Indian sales and Goods Act, Indian Partnership Act, Central Excise Sales Tax , Income Tax Act, Value Added Tax (VAT), GST.

9. Preparation of project report: Selection of product, Process and plant and machinery selection, Layout planning, Financial viability, Marketing and distribution of goods, Study of probable reasons of failure
10. Business Aspects: Business ethics, export environment, procedure and Documentation, venture capital financing, intellectual property act, patents, GATT.

Test books/ Reference Books:

1. Developing New Entrepreneurs - Entrepreneurship Development Institute of India, Ahmadabad.
2. Handbook of New Entrepreneurs
3. Management of Small Scale Industry - Vasant Desai (Himalaya Publication)
4. Entrepreneurship Playing to Win- Gordon Betty (Taraporwala & Co.)
5. Motivating Economic Achievement- David C. McClelland, David G. Winter
6. Industrial Maharashtra- Facts, Figures and Opportunities (M.I.D.C. Mumbai).
7. Project Planning & Entrepreneurship Development - T. R. Banga
8. Dynamics of Entrepreneurial Development & Management- Vasant Desai (Himalaya Publication)
10. S.S.I. and Entrepreneurship- Vasant Desai (Himalaya Publication)

ELECTIVE I for Semester I

1. NON-DESTRUCTIVE TESTING

Course Type: Theory / Practical	Theory
Required/Elective	Elective
Prerequisite	Basics of Data analysis for research
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Content:

1. Visual Testing Fundamentals of Visual Testing – vision, lighting, material attributes, environmental factors, visual perception, direct and indirect methods – mirrors, magnifiers, boroscopes and fibroscopes– light sources and special lighting–calibration- computer enhanced system – Employer defined applications, metallic materials including raw materials and welds – Inspection objectives, inspection checkpoints, sampling plan, inspection pattern etc– classification of indications for acceptance criteria - Codes, Standards and Specifications (ASME,ASTM,AWS etc.)
2. Liquid Penetrant Testing Principles – types and properties of liquid penetrants – developers – advantages and limitations of various methods - Preparation of test materials – Application

of penetrants to parts, removal of excess penetrants, post cleaning – Control and measurement of penetrant process variables –selection of penetrant method – solvent removable, water washable, post emulsifiable – Units and lighting for penetrant testing – calibration- Interpretation and evaluation of test results - dye penetrant process applicable codes and standards.

3. Magnetic Particle Testing Theory of magnetism – ferromagnetic, paramagnetic materials – characteristics of magnetic fields – magnetic hysteresis–magnetization by means of direct and alternating current – surface strength characteristics –Depth of penetration factors– Circular and longitudinal magnetization techniques, current calculation — field produced by a current in a coil, shape and size of coils, field strength, inspection materials, wet and dry particles – portable, mobile and stationary equipment – calibration- capabilities of equipment– magnetic particle inspection of castings and welding – Dry continuous method, wet residual method – Interpretation and evaluation of test indications – Principles and methods of demagnetization – Residual magnetism – applicable codes and standards.

4. Eddy Current Testing Generation of eddy currents – effect of change of impedance on instrumentation – properties of eddy currents – eddy current sensing elements, probes, type of coil arrangement – absolute, differential, lift off, operation, applications, advantages, limitations –Through encircling coils, type of arrangements –absolute, differential fill factor, operation, application, advantages, limitations - Factors affecting sensing elements and coil impedance - test part and test system – Signal to noise ratio – equipment's, reference samples, calibration, inspection of tubes, cylinders, steelbars, welded tubing, plates and pipes, Remote Field Sensing - Interpretation/Evaluation – Applicable codes and standards.

5. Ultrasonic Inspection Methods and Equipment Principle of pulse echo method, through transmission method, resonance method – Advantages, limitations – contact testing, immersion testing, couplants– Data presentation A, B and C scan displays, comparison of contact and immersion method. Pulse Echo instrumentation, controls and circuits, pulse generation, signal detection, display and recording methods, gates, alarms and attenuators, detectability of defects. Calibration of Testing Equipment Basic instrument calibration Testing/Evaluation/interpretation types, origin and typical orientation of discontinuities - response of discontinuities to ultrasound – safety precautions, Test Procedure- Scan plan/technique sheets, Applicable codes and standards, specifications (ASME, ASTM, AWS, BS. etc.)

6. Radiographic Image Quality and Radiographic Techniques Radiographic sensitivity – Radiographic Contrast, film Contrast, Subject Contrast, Definition, Radiographic density – penetrameters or Image Quality Indicators – Intensifying screens – intensification factor, control of scattered radiation, filters, diaphragms, masks – Radiography of weldments – single and double wall Radiography – panoramic radiography-procedure shooting sketch/technique sheets. Radiation Detectors and Safety Special and SI Units of radiation – Principle of radiation detectors – ionization chamber, proportional counter, G. M. counters, scintillation counters, solid state detectors – Biological effect of ionizing radiation – Operational limits of exposures – Radiation hazards evaluation and control – Design of radiography installation and shielding calculations.

Test books/ Reference Books:

ASNT industry handbook

2. ADVANCED COMPOSITES

Course Type: Theory / Practical	Theory
Required/Elective	Elective
Prerequisite	Basics of Data analysis for research
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Contents:

Composite materials in engineering, reinforcements and the reinforcement matrix interface - natural and synthetic fibers, synthetic organic and inorganic fibers, particulate and whisker reinforcements, reinforcement-matrix interface. Polymer matrix composites (PMC) – polymer matrices, processing of polymer matrix composites, characteristics and applications, composites with metallic matrices - metal matrix composites processing (MMC), Interface reactions, properties of MMCs, characteristics and application, Ceramic matrix composites (CMC)- processing and structure of monolithic materials, processing of CMCs, some commercial CMCs. Mechanical properties in composites, large particle composites and the rule of mixtures for elastic constants, Mechanical properties of fiber reinforced composites, Effect of fiber length, Critical fiber length, Strength of continuous and aligned fiber composites, Discontinuous and aligned fiber composites, Toughening Mechanism, Impact Resistance, Fatigue and Environmental Effects. Structural Composites: Cement matrix composites, Steel Reinforced Concrete, Pre-stressed concrete, Thermal Control, Vibration reduction. Polymer matrix composites-vibration damping. Composite materials for Electrical, Electromagnetic and Dielectric applications, Microelectronics and Resistance heating, Electrical insulation, capacitors, piezoelectric, ferroelectric functions, electromagnetic windows, solid electrolytes, microwave switching. Composite materials for optical and magnetic applications, optical waveguide, optical filters and lasers, multilayer for magnetic applications.

Text books/Reference Books:

1. Principles of Materials Science and Engineering, William F. Smith, Third Edition, 2002, McGraw-Hill.
2. Composite Materials: Engineering and Science, Matthews F.L., and Rawlings R. D., 1999, Wood head Publishing Limited, Cambridge England.
3. Composite Materials-Functional Materials for Modern Technology, DDL Chung, Springer-Verlag Publications London.
4. The nature and Properties of Engg. Materials, Jastrzebaski, John Wiley & Sons, New York.
5. Composite Materials Handbook, Mel M. Schwartz (R), 2nd Edition, 1992, McGraw-Hill, New York.
6. Mechanics of Composite Materials, Autar K. Kaw, 1997, CRC Press, New York. 16

7. Fundamentals of Fiber Reinforced Composite Materials, A. R. Bunsell, J. Renard, 2005, IOP Publishing Ltd.
8. Composite Materials Science and Engg., Chawla K.K., Second Edition, 1998, Springer Verlag.

3. NANO MATERIALS AND NANO TECHNOLOGY

Course Type: Theory / Practical	Theory
Required/Elective	Elective
Prerequisite	Basics of Data analysis for research
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Contents:

Definition, length scales, classification of nanomaterials, effect of particle size on thermal, mechanical, electrical, magnetic, and optical properties of the nanomaterials, Inspiration from Nature about nanotechnology (or Nanobiotechnology). Synthesis of nanomaterials: Top down approaches like ball milling, severe plastic deformation, lithography (optical, UV-visible, Deep-UV visible, X-ray, e-beam), soft lithography etc., Bottom-up approaches like inert gas condensation, chemical vapor deposition, colloidal method, sol-gel method, and atomic layer deposition (ALD) and Laser nanomanufacturing. Synthesis and applications of nanowires; Synthesis, purification and applications of carbon nanotube (CNT); Synthesis of expanded graphite (EG)/graphene. Fabrication of nanocomposites; Clay-polymer, metal-polymer, CNT-polymer, EG-polymer and CNT-metal. Characterization of Nanomaterials; X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), scanning probe microscopy (SPM), Raman spectroscopy, UV-visible spectroscopy, Laser particle size analyzer, and specific surface area analyzer (BET). Applications of nanomaterials in nanocomposites, electrical/electronics, solar cells, computer chips, display, nanofluids, ferrofluids, hydrogen storage, fuel cell, antibacterial fabrics, sensors, magnetic tapes, nanocomposite coating for wear and corrosion resistance, cosmetic and construction industries. Pros and cons of the nanomaterials and nanotechnology for the human being.

Text books/ Reference Books:

1. Textbook of Nanoscience and Nanotechnology by B.S. Murty and P. Shankar, Universities Press (India) Private Limited, 2012, 1st Edition.
2. Nanostructures and Nanomaterials: Synthesis, Properties & Applications by Guozhong Cao, Imperial College Press, 2004, 2nd Edition.
3. Introduction to Nanoscience and Nanotechnology by Gabor L. Hornyak, H.F. Tibbals, Joydeep Dutta, John J. Moore, CRC Press, 2008, ISBN-13: 978-1420047790.

4. Introduction to Nanotechnology by Charles P. Poole, Jr., Frank J. Owens, Wiley, 2003, ISBN: 978-0-471-07935-4.
5. Nanomaterials, Nanotechnologies and Design: An Introduction for Engineers and Architects by Daniel L. Schodek, Paulo Ferreira, and Michael Ashby, Butterworth-Heinemann, 2009, 1st Edition.
6. Nanomaterials: An Introduction to Synthesis, Properties and Applications by Dieter Vollath, Wiley-VCH, 2ndEdn, 2013, ISBN: 978-3-527-33379-0.
7. Nanoscale Materials in Chemistry edited by Kenneth J. Klabunde and Ryan M. Richards, 2ndedn, John Wiley and Sons, 2009.
8. Nanocrystalline Materials by A I Gusev and AARempel, Cambridge International Science Publishing, 1st Indian edition by Viva Books Pvt. Ltd. 2008.
9. Springer Handbook of Nanotechnology by Bharat Bhushan, Springer, 3rdedn, 2010.
10. Carbon Nanotubes: Synthesis, Characterization and Applications by Kamal K. Kar, Research Publishing Services; 1stedn, 2011, ISBN-13: 978-9810863975.

4. Industrial Automation and Safety

Course Type: Theory / Practical	Theory
Required/Elective	Elective
Prerequisite	Foundry Processes
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	30/20/--/--

Course Contents:

Introduction to Automation: Definition and fundamentals of automation, reasons for Automating, basic elements of an automated system: Power, Program and control system

Advanced automation functions: safety, maintenance & repair diagnosis, error detection and recovery

Mechanization and Automation: Mechanization and automation, product cycle, hard Vs flexible automation, Capital- intensive Vs low cost automation, Types of systems-mechanical, electrical, hydraulic, pneumatic and hybrid systems, Automation using CAMS, Geneva mechanisms, gears etc.

Pneumatics and hydraulics: Hydraulic and pneumatic devices-Different types of valves ,

Actuators and auxiliary elements in Pneumatics & hydraulics , their applications

Actuators: Principle and selection of mechano-electrical actuators (1) DC motors (2) Stepper Motors (3) Solenoid Actuators (4) Servo Motors (5) BLDC

Robots and their applications: Introduction to robots, Types, Classifications, Selection of robots, Robot Degrees of freedom, Robot configuration, Accuracy and repeatability, Specification of a robot, Robot feedback controls:

Point to point control and Continuous path control, Control system for robot joint, Adaptive control, Drives and transmission systems, End effectors, Industrial robot applications of robots

Factories act and rules - Workmen compensation act. Indian explosive act - Gas cylinder rules - SMPV Act - Indian petroleum act and rules. Environmental pollution act Manufacture, Storage and Import of Hazardous Chemical rules 1989 Indian Electricity act and rules. Overview of OHSAS 18000 and ISO 14000

Text books/ Reference Books:

1. Industrial Automation and Robotics: An Introduction, A.K. Gupta, S.K. Arora, Jean Riescher Westcott · 2016
2. The Factories Act 1948, Madras Book Agency, Chennai,
3. The Environment Act (Protection) 1986, Commercial Law Publishers (India) Pvt.Ltd., New Delhi.
4. Water (Prevention and control of pollution) act 1974, Commercial Law publishers (India) Pvt.Ltd., New Delhi.
5. Air (Prevention and control of pollution) act 1981, Commercial Law Publishers (India) Pvt.Ltd., New Delhi.
6. Explosive Act, 1884 and Explosive rules, 1883 (India), (2002), Eastern Book company, Lucknow, 10th Edition
7. The manufacture, storage and import of hazardous chemical rules 1989, Madras Book Agency, Chennai.
8. ISO 9000 to OHSAS 18001, Dr. K.C. Arora, S.K. Kataria& Sons, Delhi

ELECTIVE II for semester II

1. HUMAN RESOURCE MANAGEMENT

Course Type: Theory / Practical	Theory
Required/Elective	Elective
Prerequisite	Basics of Data analysis for research
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course content:

1. Overview of Human Resource Management:- Evolution of Human Resource Management from commodity approach to systems approach. Activity of Human Management – Perspective and challenges.

2. Role of Human resource Management:- Human resources Management of work Changing Environmental and Human resource Management Objectives and Importance of HRM today and tomorrow.
3. Human Resource Planning: Human resource planning on macro level, Human resource planning in India Challenges and Possible solutions, Human Resource Demand Forecasting Supply forecasting. Preparing actions plan.
4. Human resource planning at micro level:- Job analyses,- uses of job analyses; Methods and process of job analyses, Job description and job specification, Examples and exercise.
5. Procurement of Human Resource: Recruitment – Meaning and Process Formulating recruitment Policy, Evaluation of Recruitment Sources Modern Techniques of Recruitment Sources – Internet Based , Placement Agencies
6. Selection of Human Resource: Meaning and Process, Selection Hurdles – Application Blank, Employment Test – Utility and Validity, Employment Interviews, Principles and Techniques, Medical Text, referenced Check Appointment – Terms and Conditions.
7. Training for Development: Concept of Training and Developing ,Steps in Training and Development, Training Process: Identification of Training Needs, Sources of Information, designing the Program, Methods of Training Uses, Advantages and Disadvantages, Evaluation of Training, Evaluation of Procedures.
8. Performance Appraisal: Definition, Objectives, Essential of Performance appraisals and problems of performance appraisal process of Performance appraisal – Self Assessment and importance, Methods of Performance Appraisal – Traditional and Modern Methods – Straight Ranking Method, Peared Comparison Method, Critical Incident Method, Behavioral Anchored Rating Scale.

Test books/Reference Books :

1. Managing Technical People – Humphrey –Pearson.
2. Management of Organizational Behavior Leading Human Resources – Hersey.
3. Strategic Human Resource Management – Greer.
4. Managing Human Resources – Gomez – Mejm.
5. A framework for Human Resource Management – Dessler.

2. PRODUCTION AND OPERATION MANAGEMENT

Course Type: Theory / Practical	Theory
Required/Elective	Elective
Prerequisite	Basics of Data analysis for research
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Content:

1. Introduction: Relation between production and operations and other functions, products and services, impact of information technology on productions and operations management, Business strategy- competitive priorities, developing operations strategy, productivity and competitiveness.
2. Product and Service Design: Traditional and concurrent product design, design for manufacture, service, assembly, Design of services, types of services, Quality of design, costs of quality
3. Forecasting Models: Classification, simple and weighted moving average method, exponential smoothening methods: additive model, trends and seasonality model, mixed model, Regression (linear and multiple) models, causal model, measures of forecasting accuracy, reliability of forecasts
4. Aggregate Production Planning: Production planning strategies, aggregate production planning model, chase demand and level workforce strategies, and techniques- trial and error, linear programming, transportation model, dynamic programming, Master production schedule, Materials requirement planning - structure and application; Capacity planning- measures and methods to generate capacity, Aggregate planning for services- yield management
5. Operations Scheduling: Approaches to scheduling – infinite and finite loading, forward or backward scheduling, Assignment model for assigning jobs to work centers, dispatching rules for scheduling n jobs on one machine, composite rules, scheduling with Johnson's rule – n jobs-2 stations with same and different sequence, 2 jobs-n stations (graphical method), preparation of Gantt's chart, job shop scheduling, open shop scheduling, dynamic scheduling in flexible manufacturing systems, employee scheduling for service.
6. Independent Demand Inventory Management: Classification, EOQ models, order timing decisions, Safety Stock and reorder level decisions. Order quantity and reorder point, Continuous review systems, periodic review systems, selective inventory control - ABC analysis, Multi-item and Coordinated Replenishment Models- Spare parts and maintenance inventory models,
7. Inventory models with probabilistic demands: Single period discrete probabilistic demand model, multiple period probabilistic models
8. Theory of constraints: Optimized Production Technology, Drum-rope-buffer models, Constant- WIP (CONWIP) models, Planning and Control of JIT Systems

Test books/ Reference Books:

1. R. B. Khanna, (2007), Production & Operations Management, PHI
2. Martin K. Starr, (2007), Production & Operations Management, India Edition, Cengage Learning
3. Dr. K.C. Arora,(2009), Production & Operations Management, University Science Press (Laxmi Publications Pvt. Ltd.)
4. Edward S. Buffa & Rakesh K. Sarin, (2010), Modern Production / Operations Management, 8/e, Wiley India Pvt. Ltd.
5. Joseph S. Martinich, (2010), Production & Operations Management- An Applied Modern Approach, Wiley India Pvt. Ltd.
6. Everett E. Adam Jr, & Ronald J. Ebert, Production & Operations Management,
7. Jay Heizer, Barry Render & Jagdeesh Rajshekhar, (2009), Operations Management, 9/e, Pearson Education

8. Lee J. Krajewski & Larry P Ritzman, Operations Management- Strategy & Analysis, 6/e, Pearson Education.
Page 31 of 46
9. Inventory management and Production Planning and Scheduling by E Silver, D Pyke and R Peterson, Wiley India
10. R Tersine, Principles of Inventory and Materials Management, Pearson Education
11. B. Mahadevan, (2007), Operations Management- Theory & Practice, Pearson Education
12. Panneerselvam R., (2006), Production & Operations Management, PHI
13. Silver, Pyke & Peterson, Inventory Management & Production Planning & Scheduling 3/e, John Wiley & Sons

3. COSTING AND COST CONTROL

Course Type: Theory / Practical	Theory
Required/Elective	Elective
Prerequisite	Basics of Data analysis for research
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Content:

SECTION – I

1. Introduction: (a) Concept of cost, cost unit, cost center, classification of cost, different costs for different purposes. (b) Definition of costing, cost-price-profit equation, desirable conditions for a costing system.
2. Cost Estimating: Definition, purpose and functions of estimation, role of estimator, constituents of estimates, estimating procedures.
3. Estimation of Weight and Material Cost: a) Process of breaking down product drawing in to simpler elements or shapes, estimating the volume, weight and cost b) Review of purchasing procedure, recording of stock and consumption of material by LIFO, FIFO, Weighted average method
4. a) Estimation of foundry cost: Constitutes, direct cost, indirect cost, Procedure of estimation foundry cost b) Estimation of machining cost: Constituents, direct cost, indirect cost, Procedure of estimation of machining cost.
5. Machine hour rate: definition, constituents, direct cost, indirect cost, steps for estimation of machine hour rate for conventional machines, CNC lathe and machining centre
6. Labour Cost – Direct and indirect labour, Workmen classification, Definition of wages, Methods of remuneration

SECTION –II

7. Overheads: Elements of overheads, classification, general considerations for collection, analysis of overheads, different methods for allocation, apportionment, absorption of overheads.

8. Cost Accounting Methods: Job costing, Batch costing, Unit costing, Process costing, Contract costing, Activity based costing
9. Cost Control: Use of cost data for policymaking and routine operation, control techniques such as budgetary control, standard cost, variance analysis, marginal cost and break even analysis
10. Cost Reduction Areas: Procedures and systems in product, methods and layouts, administrative and marketing, rejection analysis, cost of poor quality, value analysis and value engineering, Zero Base Budgeting
- Note: Numerical treatment on topics 3, 4, 5, 7, 8 and 9 is essential.

Text books/ Reference Books:

1. Principles & Practice of Cost Accounting – N. K. Prasad (Book Syndicate Pvt. Ltd.)
2. Costing Simplified: Wheldom Series – Brown & Owier (ELBS)
3. Cost Accounting: B. Jawaharlal (TMH)
4. Cost Accounting: R.R. Gupta.
5. Cost Accounting, 13/e - B. K. Bhar, (Academic Publishers, Kolkata)
6. Cost Accounting: Jain, Narang (Kalyani Publishers)
7. A Text Book of Estimating and Costing Mechanical – J.S. Charaya & G. S. Narang (Satya Prakashan)
8. Mechanical Estimation and Costing – TTTI, Chennai (TMH)
9. Theory & Problems of Management & Cost Accounting – M.Y. Khan, P. K. Jain (TMH)

4. QUALITY MANAGEMENT SYSTEM

Course Type: Theory / Practical	Theory
Required/Elective	Elective
Prerequisite	Basics of Data analysis and interpretation for research
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	50/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Content:

1. Scope, Contest of the organization, Leadership, Planning, support, Operation, Performance evaluation, Improvements.
2. Executive Overview, ISO 9001:2015 Compliance, Documentation and Implementation, Internal Auditing, IATF (The International Automotive Task Force)

Text books/ Reference Books:

1. ISO 9001 QMS

LIST OF EXPERIMENTS

Semester I

Sr. No.	Name of Experiment
1.	Surface defects finding using Liquid penetrant testing
2.	Sub-Surface defects finding using Magnetic particle testing
3.	Internal defects finding using Ultrasonic testing
4.	Internal defect interpretation using Radiography testing (Radiographs)
5.	Microstructure analysis using replica method
6.	Grain size measurement by Line-Intercept method
7.	Study of Deformation behaviour of ductile and Brittle materials
8.	Study of Recrystallization of metal at cold and hot working.

Semester II

Sr. No.	Name of Experiment
1.	Prepare 3D model of objects using suitable modelling software
2.	Simulate the metal flow and evaluate the design using simulation software

M. VOC IN FOUNDRY TECHNOLOGY PART-II

Level	Semester	Subjects	Credits
Level 8	Semester I	1. Design of Experiment and Research Methodology	3
		2. Concepts in Material Science	3
		3. Advances in Iron and Steel Making	3
		4. Mechanical Behaviour of Materials	3
		5. Elective I	3
		Metal Testing Lab	12
		Seminar I	3
	Semester II	1. High Pressure Die Casting	3
		2. Industrial Engineering	3
		3. Total Quality Management	3
		4. Entrepreneurship Development	3
		5. Elective II	3
		CAD and Simulation Lab	12
		Seminar II	3
Level 9	Semester III	Industrial Training and Report	16
		Seminar III	3
		Dissertation Phase I	11
	Semester IV	Dissertation Phase II	30

M.VOC. (FOUNDRY TECHNOLOGY) SEMESTER– III

1. INDUSTRIAL TRAINING AND REPORT

Course Type: Theory / Practical	Practical
Required/Elective	Required
Evaluation Scheme:	200

The purpose of industrial training is to offer wide range of practical exposures to latest practices, equipment and techniques used in the field. This training programme will help the student in acquiring hands on experiences of various practices and events required to perform in different job situations. Through the industrial training the students are given an opportunity to develop psychomotor skills and problem-solving ability.

The industrial Training has basically the following three components:

1. Industrial Training in the Industry
2. Report Writing and Evaluation

2. SEMINAR- III

Course Type: Theory / Practical	Theory
Required/Elective	Required
Evaluation Scheme:	50

Seminar - III shall be based on topic of the Dissertation Work. It may include literature review, required theoretical input, study and comparison of various approaches for the proposed dissertation work. The candidate shall prepare a report of about 25 pages. The report typed on A4 sized sheets and bound in the prescribed format shall be submitted after approval by the Guide and endorsement of the Head of Department. It will be assessed for term work.

DISSERTATION:

Course Type: Theory / Practical	Practical
Required/Elective	Required
Evaluation Scheme:	200

The dissertation work to be carried out individually commences in the Semester III and extends through Semester IV. The topic of dissertation work related should be related to the areas of Foundry/Casting and related applications. Applications of computer as a tool for conceptualization, design, analysis, optimization, manufacturing, manufacturing planning /management, quality engineering, simulation of products / processes / mechanisms / systems, experimental study, etc. are to be encouraged and preferred.

SYNOPSIS APPROVAL The Head of the Department and/or Principal shall appoint a Guide and one External expert to review and approve. The candidates shall submit the synopsis to the College/Department in the prescribed format before the due date.

DISSERTATION PHASE - I It shall include the problem definition, literature survey, approaches for handling the problem, finalizing the methodology for the dissertation work and design calculations / experimental design etc. A report of the work shall be submitted at the end of Semester III after approval by the Guide and endorsement of the Head of Department. It will be assessed for term work, by the evaluation committee (*) appointed by the Head of the Department, for appropriateness, sufficiency of contents and offer suggestions if any.

M.VOC. (FOUNDRY TECHNOLOGY) SEMESTER– IV

DISSERTATION PHASE II

Course Type: Theory / Practical	Practical
Required/Elective	Required
Evaluation Scheme: Internal/External	150/300

The candidate shall submit the detailed report as per the synopsis approved by the Department/College/Approval Committee, of the dissertation work in the prescribed format after approval by the Guide and endorsement by the Head of the Department. It will be assessed for term work by the evaluation committee (*) appointed by the Principal/Head of the Department, for completion of the proposed work.

(*) Note: The evaluation committee shall consist of the Guide, one External expert faculty member and the Head of the Department or his/her representative.

**VIVEKANAND COLLEGE, KOLHAPUR
(AUTONOMOUS COLLEGE)**

Board of Studies in Graphic Design

Choice Based Credit System Pattern

Syllabus

For

M.Voc Part-I

(To be implemented from Academic Year 2020-2021 onwards)

MASTER OF VOCATION (M.Voc)

STRUCTURE OF SYLLABUS:

To be implemented from the academic year 2020-2021

1. Title of the course: MASTER OF VOCATION (Graphic Design)

A. INTRODUCTION

Graphic design is the creative planning and execution of visual communication. One learns to create a combination of shapes and forms, words and images, in order to reproduce them in some flat medium (two dimensional - paper, cardboard, cloth, plastic, video, computer, or projection screen, on poster, billboard or other signage) or in a three-dimensional form (fabricated or manufactured) in order to convey information to a targeted audience. All graphic design has a purpose or function. Usually its purpose is commercial to explain aesthetically something -- to express, inform, and influence the thoughts and actions of its audience.

This subject introduces the student to art intended to communicate information and advertising. The focus is on studying and using layout and design concepts used in the graphic design field. The students will employ both analog media (drawing with pencil and paper, etc.) and digital media -- using up-to-date computer tools (graphics hardware and software - for drawing, painting, layout, typography, scanning, editing and photography).

1.Creating Art: Students know and apply the arts, disciplines, techniques and processes to communicate in original or interpretive work.

2.Art in Context: Students demonstrate how elements of time and place influence the visual characteristics, content, purpose and message of works of art.

3.Art as Inquiry: Students demonstrate how the arts reveal universal concepts and themes. Students reflect upon and assess the characteristics and merits of their work and the work of others.

B. RATIONALE

Design is the process of selection where visual elements such as point, line, shape, volume, tone, texture, color, form, format, space, and structure are used by students to express their ideas. Visual sensitivity and working knowledge of design elements would be developed by solving a series of problems and employing a variety of media and materials. The curricular area aims at enabling the students to develop their mental faculties of observation, imagination, and creation and develop skills and sensitivity towards the use of visual elements for an effective visual communication.

Design is an activity of problem solving for the well being of society and individuals. Today, in the world of information and communication everyone has to communicate and get

communicated by different groups of people through a wide variety of communication systems.

Graphic designs course have great potential in providing creative solutions to communication of complex phenomena of print media such as books, magazines and newspaper, known as pictographic depictions or concept visualization. It can be traditionally applied in typography, cartooning (social, political and educational), and designing poster, book-covers, letter heads, news papers, brochure, logo, textile prints, or even jewelries. Since the advent of personal computers and design software, graphic design is being utilized in electronic media-often referred to as interactive design which has unlimited applications in advertisements. The students can later become graphic designers working in print production (newsletters, posters, brochures, etc). Graphic designers combine text and images to communicate a message: sell a product or service, inform, or entertain.

The Graphic Design curriculum focuses on creating intelligent and powerful visual communication. Students build a strong foundation for a graphic design career by learning design techniques, visual thinking, concept development, colour, composition, and typography, through case studies and hands-on exercises. During the study, assignments will incorporate problem solving projects that relate to visual communication. The course includes introduction to computer as a tool to create, modify and present the visual messages.

C.COURSE OBJECTIVES

By studying Graphic Design students will have a wider horizon in the field of art and will

- Demonstrate artistic growth by executing a variety of images/ text as images, traditional and contemporary techniques that solve complex design problems using creative thinking and analytical skills.
- Develop and demonstrate their understanding and skillful use of the elements and principles of visual design (*1. conceptual element, 2. visual element, 3. relational element & 4. practical or functional element.*)
- Gain skill to use the digital tools as a powerful means of communication for creation, modification & presentation.
- Study the works of contemporary artists, designers as well as the masters in the field and discuss and enrich their vocabulary of design.
- Learn ways to apply aesthetic sensibilities into their works and explore ways to balance between formal theories with practical applications.

2. Duration:

The duration of the M.Voc. Course will be of **two years**.

- **M.Voc. Part I - Graphic Design**
- **M.Voc. Part II - Graphic Design**

The final M.Voc degree will be awarded only after completion of two year course. The suggested credits for each of the years are as follows:

Awards		Normal calendar duration	Skill Component Credits	General Education Credits
Year 1	Post Graduate Diploma in Graphic Design	Two Semesters	36	24
Year 2	Master in Graphic Design	Four Semesters	36	24
TOTAL			72	48

General Education Component should not exceed 40% of the total curriculum.

Credits can be defined as the workload of a student in

1. Lectures
2. Practical
3. Seminars
4. Private work in the Library/home
5. Examination
6. Other assessment activities.

The following formula should be used for conversion of time into credit hours.

- a) One Credit would mean equivalent of 15 periods of 50 minutes each, for theory, workshops /labs and tutorials;
- b) For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops;
- c) For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

3. Eligibility:

The eligibility condition for admission to M.Voc. programme shall be B.F.A., B.Voc or G.D. Art from any recognized board or university.

4. Medium of Instruction:

The medium of instruction of the course will be **English**

5. Pattern: Semester Pattern.

6. Examination:

A. Scheme of examination:

- The semester examination will be conducted at the end of each term (both theory and practical examination)

- Theory paper will be of 50 marks each. The practical examination will be of 200 marks and industrial practical training/project work is of 50 marks.
- Question papers will be set in the view of the entire syllabus and preferably covering each unit of the syllabus.

For each semester there will be four theory papers. Practical Examination will be conducted at the end of every semester.

Paper Number	Title of Paper (For Semester I)	Internal Marks	Theory Exam Marks	Total Marks
I	UI-UX	20	30	50
II	SEO – I	20	30	50
III	Communication – I	20	30	50
IV	Human Factors in Visual Design	20	30	50
TOTAL		80	120	200

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	180	Projects/ Industry Visit	50
2	Portfolio	20		
Total		200		50

The total weightage of first term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 50 X 4	200
2	Practical Examination.	200
3	Internal Assessment	50
TOTAL		450

B. Nature of question paper:

For each paper there will be **THREE** compulsory questions.

General nature and marking system of the question paper will be:

Question Number	Type		Marks
Q.1	MCQ	No internal options	6
Q.2	Long answer	Any two out of three	12
Q.3	Short notes	Any four out of six	12

C. Standard of Passing:

To pass the examination a candidate must obtain at least 40% (i.e. 12 marks out of 30) in individual subjects, in internal assessment and University examination each in all theory and practical subjects.

D. External Students: Not applicable as this is a practical oriented course.

7. University Term: As per academic calendar of the university.

For the first year i.e. Diploma in Graphic Design practical examination and theory paper assessment will be done at college level.

8. List of equipment and instruments:

1. Computer Machines
2. Colour Printer
3. Scanner
4. Digital Camera
5. Projector
6. Internet Connectivity
7. CCTV Camera for Graphic Design Laboratory is must.

9. Laboratory Safety Equipments:

Part I: Personal Precautions:

1. Must wear **Lab Aprons / Lab Jacket** and proper shoes.
2. Except in emergency, over – hurried activities is forbidden.
3. Eating, Drinking and Smoking in the laboratories is strictly forbidden.

Part II: Use of Safety and Emergency Equipments:

1. First aid Kits
2. Fire extinguishers (dry chemical and carbon dioxide extinguishers)
3. Management of Local exhaust systems.
4. Sign in register if using instruments.

10. Workload:

Each skill based paper (i.e. Paper no. I, II, III and IV) will have **four theory** periods per week. There are **four practical** per week. Each practical will be of four periods. The practical batch will have maximum 20 students.

The total workload for one batch will be:

1. Four Papers on skill based Education: 4 X 4	=	16 Theory Periods.
2. Four Practical work per week: 4 X 3	=	12 Practical periods.
3. Project Work per batch per week:	=	02 Periods

	TOTAL	30 Periods.

Working hours will be 5 hours (300 minutes) per day i.e. six periods each of 50 minutes.

13. MEMORANDUM OF UNDERSTANDING (MOU):

The purpose of this MOU is to clearly identify the roles and responsibilities of each party (i.e. college and industry partner) as they relate to the implementation of the **M.Voc. Programme in Graphic Design** at the college.

It is recommended to sign at least **TWO MOU** with the industry partners in the related field.

14. PROGRAMM OUTCOME (PO) :

1. Analyze, synthesize, and utilize design processes and strategy from concept to delivery to creatively solve communication problems.
2. Create communication solutions that address audiences and contexts, by recognizing the human factors that determine design decisions.
3. Utilize relevant applications of tools and technology in the creation, reproduction, and distribution of visual messages.
4. Apply graphic design principles in the ideation, development, and production of visual messages.
5. Identify and utilize design history, theory, and criticism from a variety of perspectives, including: art history, communication/information theory, and the social/cultural use of design objects.
6. Confidently participate in professional design practice and management within a collaborative work environment.
7. Employ best practices and management in the design profession and within a collaborative work environment.

M.Voc. Part - I (PG Diploma in Graphic Design) Course structure

General Structure:

The diploma course has two semesters, each of 450 marks. There will be **four theory** papers for each semester of 50 marks each.

- | | |
|---|-------------|
| 1) Paper-I: UI/UX | - 50 Marks. |
| 2) Paper-II: SEO - I | - 50 Marks. |
| 3) Paper-III: Communication – I | - 50 Marks. |
| 4) Paper-IV: Human Factors in Visual Design | - 50 Marks. |

There will be practical examination for each semester. The duration of practical examination will be of six hours and it will be of 100 marks of which 20 marks are reserved for Portfolio, Industry Training via internships, handling live Projects. The internal assessment includes visits to Advertising Agency and Graphic Design Studios, home assignment, test & tutorials etc.

SEMESTER I

SKILL BASED PAPERS:

Paper –I : UI/UX

UI/UX

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge meaning and proper use of colors in design.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	30/20/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO101.1	Gather useful information about users and activities through asking, looking, learning. The basic concept & examples of UI UX Design while creating designs, how they works together in harmony.	1
CO101.2	Learn and appreciate the skill of sketching as a process for user experience design. Learn to give and accept critiques of design ideas in a constructive manner. Demonstrate skills for low-fidelity prototyping and describe the strengths and weaknesses of a variety of prototyping methods	4
CO101.3	Appreciate the process of user experience design as a cyclical, iterative process. Understand the differences between usability and user experience. Analyze an interaction design problem and propose a user-centered process, justifying the process and identifying the trade-offs	1
CO101.4	Prepare high quality, professional documentation and artifacts relating to the design process for preparation for a professional portfolio	5

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-	-
CF107.4	-	-	2	-	-	-	-	-	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	“UI UX Design”,	Xia Jiajia	Art Power International	2016	-
2	“UX for Dummies ”,	Donald Chesnut	Wiley	2014	-
3	"Lean UX ”,	Jeff Gothelf	Shroff	2016	-
4	UI is Communication	Everett N McKey	Moegan Kaufmann	2013	-

Paper – II : SEO - I (Search Engine Optimisation)

SEO - I

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge meaning and proper use of colors in design.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	30/20/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO102.1	Understanding the concept of Search Engine Optimisation (SEO).	1
CO102.2	Know the actual role of Search Engines. Detail study of search engines, browsers, competitors, launching & working.	2
CO102.3	Create Web pages designed to be easily crawled and optimally indexed by search engines. The process of Technical SEO – The requirement of modern search engines.	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-

CF107.2	-	3	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	SEO	Adom Clarke	Smart Internet Marketing	-	2017
2	SEO - Digital Marketing	Anya Gildner	Baltika Press	-	2019
3	Eric Enge	Stephan Spencer	O'Reilly Media Inc.	-	2015
4	Digital Marketing All-in-One	Stephanic Diamond	Kindle Edition	-	2019

Paper – III : COMMUNICATION - I

COMMUNICATION - I

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge meaning and proper use of colors in design.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	30/20/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO103.1	Understand the importance of Communication in all aspects of social life	1
CO103.2	Communication definition related to graphic design. Types of Communication	2
CO103.3	Role of communication in Digital age. Look out the changes in between technological revolution.	3
CO103.4	Digital Media elements & types. Requirement of data transformation via digital communication.	2

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Communication	Adom Clarke	Smart Internet Marketing	-	2017
2	Communication - Digital Marketing	Anya Gildner	Baltika Press	-	2019
3	Eric Enge	Stephan Spencer	O'Reilly Media Inc.	-	2015
4	Digital Marketing All-in-One	Stephanic Diamond	Kindle Edition	-	2019

Paper – III : Human Factors in Visual Design

Human Factors in Visual Design

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge meaning and proper use of colors in design.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO104.1	Understanding of basic concepts and techniques related to human factors in design	1
CO104.2	Understanding of design principles and processes and the work of influential designers.	2

CO104.3	Able to explore, develop and extend design ideas by integrating specialist visual communication and techniques in response to a brief	3
CO104.4	Explain how personal preference, group preferences, style and trends may impact on the design of products, systems and/or environments.	

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	UI is Communication	Everett N McKey	Moegan Kaufmann	2013	-
2	SEO - Digital Marketing	Anya Gildner	Baltika Press	-	2019
3	Eric Enge	Stephan Spencer	O'Reilly Media Inc.	-	2015
4	Digital Marketing All-in-One	Stephanic Diamond	Kindle Edition	-	2019

SEMESTER II

For each semester there will be four theory papers. Practical Examination will be conducted at the end of every semester.

Paper Number	Title of Paper (For Semester I)	Internal Marks	Theory Exam Marks	Total Marks
I	MOTION DESIGN	20	30	50
II	SEO – II	20	30	50
III	Communication – II	20	30	50
IV	PUBLICATION	20	30	50
TOTAL		80	120	200

The practical examination will be of 200 marks.

Sr. No.	Practical examination	Marks	Internal Assessment	Marks
1	Practical	180	Projects/ Industry Visit	50
2	Portfolio	20		
Total		200		50

The total weightage of first term is of 450 marks, the details of which are-

Sr. No.	Title	Marks
1	Theory Examination 50 X 4	200
2	Practical Examination.	200
3	Internal Assessment	50
TOTAL		450

SKILL BASED PAPERS:

Paper –V : MOTION DESIGN MOTION DESIGN

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge meaning and proper use of colors in design.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO101.1	Gather useful information about Motion Design that this is the process of graphic design put it into motion.	1
CO101.2	Learn and appreciate the skill of sketching as a process animation and visual effects.	4
CO101.3	Difference between Animation and Motion Design	1
CO101.4	Create high quality, professional animation using Motion Design tools .	5

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-	-
CF107.4	-	-	2	-	-	-	-	-	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Teaching Motion Design	Michael Dooley,Steven	Simon and Schuster	2010	-
2	The Theory and Practice of Motion Design	R. Brian Stone,Leah Wahlin	Routledge	2018	-
3	Design for Motion	Austin Shaw	Routledge	2019	-
4	Motion and Design	Anonim	Unknown	2019	-

Paper – VI : SEO - II (Search Engine Optimisation)**SEO - II**

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge meaning and proper use of colors in design.
Teaching Scheme	04/00/00/00 Hours

(Lecture/Practical/Tutorial/Drawing)	
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO102.1	Generate the keywords via concept map. The study based on research and thinking process of own. Self study on working of search engines and browsers.	1
CO102.2	Define White Hat SEO Techniques and Black Hat SEO Techniques. Understand the process to create Pay-Per-Click (PPC) Campaigns	2
CO102.3	Create a web layout with appropriate keywords, meta data and URL.	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)
1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	SEO	Adom Clarke	Smart Internet Marketing	-	2017
2	SEO - Digital Marketing	Anya Gildner	Baltika Press	-	2019
3	Eric Enge	Stephan Spencer	O'Reilly Media Inc.	-	2015
4	Digital Marketing All-in-One	Stephanic Diamond	Kindle Edition	-	2019

Paper – VII : COMMUNICATION - II

COMMUNICATION - II

Course Type: Theory / Practical	Theory
--	--------

Required/Elective	Required
Prerequisite	Basic knowledge meaning and proper use of colors in design.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO102.1	Important role of Visuals, Info graphics for transfer messages. Detail study of Visual Communication	1
CO102.2	Detail study of Typical or Traditional Media and Digital Media.	2
CO102.3	Definition, Advantages- disadvantages and difference between Synchronous & Asynchronous Communication & E- Learning. Application & uses of communication tools in day to day life	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	Communication	Adom Clarke	Smart Internet Marketing	-	2017
2	Communication - Digital Marketing	Anya Gildner	Baltika Press	-	2019
3	Eric Enge	Stephan Spencer	O'Reilly Media Inc.	-	2015
4	Digital Marketing All-in-One	Stephanic Diamond	Kindle Edition	-	2019

Paper – VIII : PUBLICATION

PUBLICATION

Course Type: Theory / Practical	Theory
Required/Elective	Required
Prerequisite	Basic knowledge meaning and proper use of colors in design.
Teaching Scheme (Lecture/Practical/Tutorial/Drawing)	04/00/00/00 Hours
Total contact Hours (Lecture/Practical/Tutorial/Drawing)	48/00/00/00 Hours
Evaluation Scheme: Theory Theory Paper /Term Work/Oral/Practical	40/10/--/--

Course Outcomes (COs):

Course Outcomes(COs): Upon completion of this course, students will be able to		Mapping with PO's
CO102.1	Publication is the term that relate with designing, printing, legal context that copy write and basic definition of publication Design. Traditional Publication artwork study for printing sizes, colours, paper quality, layout, data visualization methods	1
CO102.2	The importance of Typography, photography, colours, layouting, Interactions in Publication Design. Study of Publication Design specifications in portrait, landscape and square size modes.	2
CO102.3	Electronic Publishing also known as E-Publishing, Digital Publishing or Online Publishing. How it is becoming common to distribute artworks by using online sources.	3

Correlation matrix of Course outcomes with Programmed outcomes (CO-PO)

1=Low correlation, 2=Medium correlation, 3=High correlation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2
CF107.1	3	-	-	-	-	-	-	-	-	-	-
CF107.2	-	3	-	-	-	-	-	-	-	-	-
CF107.3	-	3	-	-	-	-	-	-	-	-	-

Text Books/Reference Books/ Other Books/E-material/Paper

Sr. No	Title	Author	Publisher	Edition	Year of Edition
1	The Elements of Typographic Style	Robert Bringhurst	Unknown	-	-

2	Editorial Design	Yolanda Zappaterra	Unknown	-	-
3	Web Designing and Publishing	Prof. Satish Jain , M. Geetha Iyer	BPB Publications	-	-
4	Digital Marketing All-in-One	Stephanic Diamond	Kindle Edition	-	2020

Syllabus

Level 8	Semester I	UI-UX
		SEO – I
		Communication – I
		Human Factors in Visual Design
	Semester II	Motion Design
		SEO – II
Communication – II Publication		
Level 9	Semester III	Ethics and Laws for Media Stage & Exhibition Display
	Semester IV	Industrial Training
	Company Project	

“Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (Autonomous)**



DEPARTMENT OF STATISTICS

M. Sc. Part I

Semester I & II

SYLLABUS

**Under Choice Based Credit System
To be implemented from Academic Year 2022 - 23**

Objectives:

1. The students are expected to understand the principles, concepts, and recent developments in the Statistics.
2. To enhance student sense of enthusiasm for Statistics and to involve them in an intellectually stimulating experience of learning in a supportive environment.
3. The practical course is framed in relevance with the theory courses to improve the understanding of the various concepts in Statistics.

Program Outcomes (PO):

On successful completion of the program students will be able to:

- PO1:** Understand the principles and concepts in the statistical theory at an advanced level which take into account recent advances in the subject.
- PO2:** Acquire the strong foundation of statistical concepts which will benefit them to become good Statistician.
- PO3:** Use acquired statistical methodologies and modelling techniques to address real-life problems.
- PO4:** Gain the knowledge of software which has the wide range of opportunities in the Quality control, Planning and development, IT sector, industries, Business, Government and private sector etc.
- PO5:** Qualify various National / State level competitive exams like ISS, DSO, CSIR-UGC NET, SET, GATE, MPSC, UPSC, Banking etc.

Program Specific Outcomes (PSO):

On successful completion of the program students will be able to:

- PSO1:** Enhance sense of enthusiasm for Statistics and to involve them in an intellectually stimulating experience of learning in a supportive environment.
- PSO2:** Handle and analyse small as well as large databases with computer skills.
- PSO3:** Understand, implement and develop statistical models.
- PSO4:** Describe complex statistical ideas to non-statisticians and to present the results of their analyses in written, oral forms and can make practical suggestions for improvement.
- PSO5:** Apply statistical techniques to optimize and monitor real life phenomena related to industry and business analytics etc.

FEATURES OF DEPARTMENT:

1) Library:

Reference and Textbooks, Journals and Periodicals,

2) Equipment's in Laboratory:

32 Computers, LCD Projector, Visualizer, Smart board etc.

3) Laboratory Software's:

1) R Software

2) Python

1. Title: M. Sc. (Statistics)

2. Year of Implementation: The syllabus will be implemented from June, 2022-23 onwards.

3. Duration: Two Years

4. Pattern: M. Sc. Statistics program has semester pattern and Choice Based Credit System. The program consists of 96 credits.

5. Medium of instruction: English

6. Structure of course:

1	CC	Core Course
2	CCS	Core Course Specialization
3	CCPR	Core Course Practical
4	DSE	Discipline Specific Elective

Course	No. of course	Credit per Course	Total Credit	% of Credit
CC	14	4	56	58.33
CCS	4	4	16	16.67
DSE CCPR	2	4	8	8.33
	4	4	16	16.67
	24		96	100

M.Sc. (Statistics) Semester – I

Course Code	Title of the course	Instruction Hrs/week	Marks- End Semester Exam	Marks- Internal Assessment	Credits
CC-2300A	Real Analysis	4	80	20	4
CC-2301A	Linear Algebra	4	80	20	4
CC-2302A	Distribution Theory	4	80	20	4
CC-2303A	Estimation Theory	4	80	20	4
CC-2304A	Statistical Computing	4	80	20	4
CCPR-2305A	Practical-I	12	100	--	4
Total Credits of Sem-I					24

M.Sc. (Statistics) Semester – II

Course Code	Title of the course	Instruction Hrs./week	Marks- End Semester Exam	Marks- Internal Assessment	Credits
CC-2306B	Probability Theory	4	80	20	4
CC-2307B	Theory of Testing of Hypotheses	4	80	20	4
CC-2308B	Linear Models and Regression analysis	4	80	20	4
CC-2309B	Design and analysis of Experiment	4	80	20	4
CC-2310B	Sampling Theory & Official Statistics	4	80	20	4
CCPR-2311B	Practical-II	12	100	--	4
Total Credits of Sem-II					24

Semester I:

CC-2300A: REAL ANALYSIS

Course Objectives: At the end of the course students will be able to:

CO1: Define and recognize the basic properties of the field of real numbers.

CO2: Define and recognize the series of real numbers and convergence.

CO3: Apply the theorem in a correct mathematical way.

CO4: Define and recognize the real functions and its limits and differentiability of real functions and its related theorems.

Unit	CC-2300A: REAL ANALYSIS	No. of hours per unit / credits	Credits
Unit I	Set of real numbers, countable and uncountable sets, countability of rational numbers and uncountability of the interval (0,1) Supremum and Infimum of bounded sets, limit point of a set, open, closed, dense and compact sets. Bolzano-Weierstrass and Heine-Borel Theorems (Statements only). Applications of the theorems	15	1
Unit II	Sequence of real numbers, convergence, divergence, Cauchy sequence, Convergence of bounded monotone sequence. Limit inferior and limit superior of the sequences. Series of numbers, tests for convergence (without proof) test for absolute convergence, convergence of sequences of non-negative terms.	15	1
Unit III	Real valued function, continuous function, Uniform continuity of sequence of functions, Uniform convergence of series of functions with special emphasis on power series, radius of convergence. Riemann, Riemann -Stieltjes Integrals and their common properties. Integration by parts, Fundamental theorem on calculus, mean value theorem, their applications in finding functional of distributions.	15	1
Unit IV	Vector and Matrix differentiation, Maxima, minima of functions of several variables. Constrained maxima, minima, Lagrange's method, Taylor's theorem (without proof), implicit function theorem and their applications. Multiple integrals, Change of variables, Improper integrals, Applications in multivariate distributions. Theorem on differentiation under integral sign (without proof), Leibnitz rule (statement only) and applications.	15	1

Books Recommended:

1. S. C. Malik & S. Arora (1991): Mathematical Analysis, Wiley Eastern Limited-IInd edition.
2. R. R. Goldberg (1964): Methods of Real Analysis, Blais dell Publishing company, Newyork,

U.S.A.

3. G.R. Bartle (1976): Element of Real Analysis, Wiley, 2nd edition, 1976.
4. G.R. Bartle & D. R. Sherbert (2000): Introduction to Real Analysis-John, Wiley & Son Inc, 2000.
5. Royden(1988): Principles of Real Analysis, Mac millan.
6. Widder(1989): Advanced Calculus, Dover Publication, 1989.
7. Apostol (1985): Mathematical Analysis, Narosa Publishing House, T. M., 1985.

CC-2301A: LINEAR ALGEBRA

Course Objectives: At the end of the course students will be able to:

CO1: Solve matrix operations, including inverses and determinants.

CO2: Demonstrate understanding of the concepts of vector space and subspace, linear independence, span, and basis.

CO3: Describe eigenvalues and eigenvectors and solve eigenvalue problems.

CO4: Apply principles of matrix algebra to linear transformations and solve systems of linear equations using multiple methods.

Unit	CC-2301A: LINEAR ALGEBRA	No. of hours per unit / credits	Credits
Unit I	Vector space, subspace, linear dependence and independence, basis, dimension of a vector space, example of vector spaces. Null space, Gram- Schmidt orthogonalization process, Orthonormal basis, orthogonal projection of a vector, Linear transformations, algebra of matrices, row and column spaces of a matrix, elementary operations and elementary matrices, rank and inverse of a matrix, Null space and nullity, partitioned matrices	15	1
Unit II	Permutation matrix, reducible/ irreducible matrix, primitive / imprimitive matrix, idempotent matrix, Kronecker product, Generalized inverse, Moore-Penrose generalized inverse, Solution of a system of homogenous and non-homogenous linear equations, theorem related to existence of solution and examples.	15	1
Unit III	Characteristic roots and vectors of a matrix, algebraic and geometric multiplicities of a characteristic root, right and left characteristic vectors, orthogonal property of characteristic vectors, Caley-Hamilton Theorem and its applications.	15	1
Unit IV	Spectral decomposition of a real symmetric matrix, singular value decomposition, Choleskey decomposition, real quadratic forms, reduction and classification, index and signature, extreme of a quadratic form, simultaneous reduction of two quadratic forms.	15	1

Books Recommended:

1. F.A. Graybill, An Introduction to Linear Statistical Models Vol 1, Mc Graw-Hill Book Company Inc, 1961.
2. G. Hadely, Linear Algebra, Narosa Publishing House, 1962.
3. D. Harville, Matrix Algebra from Statistics Perspective, Springer, 1997.
4. A. R. Rao and P. Bhimasankaram, Linear Algebra, Hindustan Book Agency, Second dition, 2000.

5. C. R. Rao, Linear Statistical Inference and Its Applications, Wiley, Second Edition, 2001.
6. J. Schott, Matrix Analysis for Statistics, Wiley, Third edition, 2016.
7. S. B. Searl, Matrix Algebra Useful for Statistics, Wiley, 2006.
8. Kshirsagar A.M (1983): Course in linear Models-Marcel Dekker.

CC-2302A: DISTRIBUTION THEORY

Course Objectives: At the end of the course students will be able to:

CO1: Recognize and learn concept of mixture of distribution and their decomposition.

CO2: Execute transformation of univariate random variables and different moment inequalities.

CO3: Describe the concept of central and non-central distributions.

CO4: Learn the concept of order statistics.

Unit	CC-2302A: DISTRIBUTION THEORY	No. of hours per unit / credits	Credits
Unit I	Review of Random experiment and its sample space, events, random variables, discrete random variables, continuous random variables. Cumulative distribution function (CDF), properties of CDF, computation of probabilities of events using CDF, quantiles, absolutely continuous and discrete distributions, mixtures of probability distributions, decomposition of mixture CDF into discrete and continuous CDFs, expectation and variance of mixture distributions.	15	1
Unit II	Transformations of univariate random variables, probability integral transformation. Concepts of location, scale and shape parameters of distributions with examples. Symmetric distributions and their properties. Moment inequalities (with proof): Basic, Holder, Markov, Minkowski, Jensen, Tchebysheff and their applications	15	1
Unit III	Random vectors, joint distributions, Independence, variance-covariance matrix, joint MGF. Conditional expectation and variances, Transformations of bivariate random variables, Bivariate Normal distribution, Marshall-Olkin bivariate exponential distribution, Bivariate Poisson distribution. Convolutions, compound distributions.	15	1
Unit IV	Sampling distributions of statistics from univariate normal random samples: central and non-central chi-square, t and F distributions. Distributions of linear and quadratic forms involving normal random variables, Fisher Cochran and related theorems: statement and applications. Order Statistics: Distribution of an order statistics, joint distributions of two order statistics, distribution of spacings, normalized spacings with illustration to exponential case, distribution of sample median and sample range.	15	1

Books Recommended:

1) Rohatagi V. K. & Saleh A. K. Md. E. (2001): Introduction to Probability Theory and Mathematical Statistics- John Wiley and sons Inc.

- 2) Johnson N. L. & Kotz. S. (1996): Distributions in Statistics Vol-I, II and III, John Wiley and Sons New York.
- 3) S. Kotz, N. Balakrishnan, N. L. Johnson: Continuous Multivariate Distributions - Second Edition, Wiley.
- 4) Casella & Berger (2002): Statistical Inference - Duxbury advanced series. 2nd edition
- 5) C. R. Rao (1995): Linear Statistical Inference and Its Applications (Wiley Eastern) Second Edition
- 6.) Dasgupta, A. (2010): Fundamentals of Probability: A First Course (Springer)

CC-2303A: ESTIMATION THEORY

Course Objectives: At the end of the course students will be able to:

CO1: Describe the notion of a parametric models, point estimation of the parameters of those models.

CO2: Construct the sufficient statistic, minimal sufficient statistic, m.l.e., moment estimator of the parameter.

CO3: Discuss the concept of MVUE, MVBUE, UMVUE.

CO4: Describe the concept of Bayesian inference and their real life applications.

Unit	CC-2303A: ESTIMATION THEORY	No. of hours per unit / credits	Credits
Unit I	Sufficiency principle, factorization theorem, minimal sufficiency, minimal sufficient partition, construction of minimal sufficient statistics, minimal sufficient statistic for exponential family, power series family, curved exponential family, Pitman family. Completeness, bounded completeness, ancillary statistics, Basu's theorem and applications.	15	1
Unit II	Problem of point estimation, unbiased estimators, minimum variance unbiased estimator, Rao-Blackwell theorem and Lehmann-Scheffe theorem and their uses. Necessary and sufficient condition for MVUE and their applications. Fisher information and information matrix, Cramer-Rao inequality, Chapman-Robinson bounds, Bhattacharya bounds, their applications.	15	1
Unit III	Method of maximum likelihood (MLE) and small sample properties of MLE, method of scoring and application to estimation in multinomial distribution. MLE in non-regular families. Other methods of estimation: method of moments, minimum Chi square. U-Statistics: one and two sample; U-Statistics theorem for one sample and two sample (statements only).	15	1
Unit IV	The concept of prior distributions, various types of priors, non-informative, Jeffrey's, least favorable prior, posterior distribution; Posterior distribution conjugate family and standard examples of such families. Bayes estimation under squared error and absolute error loss functions.	15	1

Books Recommended:

1. V. K. Rohatgi, and A. K. MD. E. Saleh (2015): Introduction to Probability Theory and Mathematical Statistics, John Wiley & sons, 3rd Edition.
2. E. L. Lehmann (1983): Theory of Point Estimation, John Wiley & sons.
3. C. R. Rao (1973): Linear Statistical Inference and its Applications, wiley, 2nd Edition.
4. B. K. Kale, and K. Muralidharan (2015): Parametric Inference: An Introduction, Alpha

Science International Ltd.

5. P. Mukhopadhyay (2015): Mathematical Statistics, Books and Allied (p)Ltd.
6. E. J. Dudewicz and S. N. Mishra (1988): Modern Mathematical Statistics, John Wiley and Sons.
7. Casella and Berger (2002): Statistical Inference, Duxbury advanced series, IInd edition.

CC-2304A: STATISTICAL COMPUTING

Course Objectives: At the end of the course students will be able to:

CO1: Construct formulas, including the use of built-in functions and analysis tool pack.

CO2: Develop the fundamentals of statistical analysis in R environment.

CO3: Describe the simulation involves building mathematical models that attempt to duplicate real-world systems or problems

CO4: Implement different resampling technique in real situations.

Unit	CC-2304A: STATISTICAL COMPUTING	No. of hours per unit / credits	Credits
Unit I	MSEXCEL: Introduction to MSEXCEL. Cell formatting, conditional formatting, Data manipulation using EXCEL: sort and filter, find and replace, text to columns, remove duplicate, data validation, consolidate, what-if-analysis. Working with Multiple Worksheets and Workbooks. Built-in mathematical and statistical functions for obtaining descriptive statistic, computing PMF/PDF, CDF and quantiles of the well known distributions, rand and randbetween function, Logical functions: if, and, or, not. Lookup functions: hlookup, vlookup, Formula Errors, Creating and Working with Charts, Database functions, Text functions, Date and time functions, Excel add-ins: analysis tool pack, Pivot tables and charts.	15	1
Unit II	R-software: Introduction to R, data types and objects, operators, data input, data import and export, built in functions for descriptive statistics, random sampling and computation of pdf, cdf and quantiles of well known distribution. Strings and Dates in R. apply family of functions. Saving work in R. Matrix algebra, graphical procedures, frequencies and cross tabulation, built in functions: lm, t.test, prop.test, wilcox.test, ks.test, var.test, chisq.test, aov. Control statements. Programming, user defined functions, Rpackages. R-studio.	15	1
Unit III	Concept of simulation. Concept of random number generator, true random number and pseudo random number generators, requisites of a good random number generator. Tests for randomness. Congruential method of generating uniform random numbers. Algorithms for generating random numbers from well known univariate discrete and continuous distributions, generating random vectors from multinomial, bivariate normal, and bivariate exponential distributions, generating random numbers from mixture of distributions (related results without proofs). Acceptance-Rejection Technique. Use of random numbers to evaluate	15	1

	integrals, to study the systems involving random variables, to estimate event probabilities and to find expected value of random variables. Use of random numbers in statistical inference.		
Unit IV	Resampling techniques: Bootstrap methods, estimation of bias and standard errors, estimation of sampling distribution, confidence intervals. Jackknife method: estimation of bias and standard errors, bias reduction method. Solution to system of linear equations: Jacobi and Gauss-Seidel methods with convergence analysis. Finding roots of nonlinear equation: Newton-Raphson method, bisection method; Newton-Raphson for system of nonlinear equations. Numerical integration: quadrature formula, trapezoidal rule and Simpson's rules for single integral.	15	1

Books Recommended:

1. Atkinson K. E. (1989): An Introduction to Numerical Analysis. (Wiley)
2. Devroye L. (1986): Non-Uniform Random Variate Generation. (Springer-Verlag New York)
3. Efron B. and Tibshirani. R. J. (1994): An Introduction to the Bootstrap. (Chapman and Hall)
4. Morgan B. J. T. (1984): Elements of Simulation. (Chapman and Hall)
5. Robert C. P. and Casella G. (1999): Monte Carlo Statistical Methods. (Springer-Verlag New York, Inc.)
6. Ross. S. M. (2006): Simulation. (Academic Press Inc)
7. Rubinstein, R. Y. (1998): Modern Simulation and Modeling. (Wiley Series in Probability and Statistics)
8. William J., Kennedy, James E. Gentle. (1980): Statistical Computing. (Marcel Dekker)

CCPR-2305A: PRACTICAL -I

Practical Number	Practical Name
1	Linear dependence and Independence of vectors and rank of matrix
2	Gram-Schmidt orthogonalization method
3	Solving system of linear equations
4	Computation of Inverse and G-inverse of a matrix.
5	Applications of Cayley-Hamilton theorem.
6	Inverse of partitioned matrix.
7	Characteristics roots and vectors and their applications.
8	Classifications and reduction of quadratic forms.
9	Sketching of pdf and CDF for Discrete distribution
10	Sketching of pdf and CDF for Continuous distribution
11	Sufficient, minimal sufficient, and complete sufficient statistics
12	UMVUE and lower bounds for variances of unbiased estimators
13	Maximum likelihood and method of moments estimation
14	Method of Scoring and method of minimum chi-square estimation
15	Practical on MSEXCEL
16	Practical on R- Software
17	Random Number Generation from Discrete and Continuous distribution
18	Applications of Simulation
19	Numerical Methods and Resampling Techniques

(Each practical should consist of problems to be solved using at least two of the following software: EXCEL/ R/python)

Semester II:

CC-2306B: PROBABILITY THEORY

Course Objectives: At the end of the course students will be able to:

CO1: Memorize the basic concepts of Sets, Sequence, Measurable function and limit.

CO2: Recognize the measure theory, random variable, distribution function, limit of sequence variables.

CO3: Explain the concept of convergence and applications with example.

CO4: Implement the central limit theorem and large-sample approximations for common statistics

Unit	CC-2306B: PROBABILITY THEORY	No. of hours per unit / credits	Credits
Unit I	Classes of sets: Sequence of sets: limsup, liminf and limit of sequence of sets field, σ - field, σ - field generated by a class of sets, Borel σ - field. Probability measure, Probability space, properties of a probability measure, continuity, mixture of probability measures. Lebesgue and Lebesgue- Stieltjes measures on \mathbb{R} . Independence of events.	15	1
Unit II	Measurable function, random variable, distribution function of a random variable, simple random variable, elementary random variable, liminf, limsup and limit of sequence of random variables. Method of obtaining a random variable as a limit of sequence of simple random variables. Integration of a measurable function with respect to a measure, expectation of a random variable, independence. Characteristic function, simple properties. Inversion theorem and uniqueness property (Statement only).	15	1
Unit III	Monotone convergence theorem, Fatous Lemma, Dominated Convergence theorem, Borel- Cantelli Lemma, (Statements only), and their applications. Convergence of sequence of random variables, Convergence in distribution, Almost sure convergence, a characterizing property, convergence in probability, uniqueness of limit, Yule Slutsky results and preservation under continuous transform. Convergence in r^{th} mean, interrelationships (Statements only), their illustration with examples	15	1
Unit IV	Weak and Strong laws of large numbers, Kolmogorov's three series theorem for almost sure convergence (Statement only), Liaponove's, Lindeberg- Feller Theorems on CLT (Statement only). Applications of the above results.	15	1

	b) Moment inequalities: - Markov, Chebychev, Holder, Minkowski and Jensen inequalities with their applications. Basic inequality Liapunov's.		
--	--	--	--

Books Recommended:

1. Bhat B. R. (1981): Modern Probability Theory –IIIrd edition: New age international limited.
2. Alan Karr, (1993) : Probability Theory – Springer Verlag.
3. Billingsley P. (1986): Probability & Measure –John Wiley and sons
4. Athreya K. B. and Lahiri S. (2006). Probability Theory, (Hindustan Book Agency).
5. Feller, W. (1969). Introduction to Probability and its Applications vol.II (Wiley Eastern Ltd.)
6. Loeve, M. (1978). Probability Theory (Springer Verlag). Fourth edition
7. Rohatgi, V.K. and Saleh, A. K. MD. E. (2015). Introduction to Probability Theory and Mathematical Statistics -3rd Edition, John Wiley & sons.

CC-2307B: THEORY OF TESTING OF HYPOTHESIS

Course Objectives: At the end of the course students will be able to:

CO1: Formulate null and alternative hypotheses, compute probabilities of types of error, MP tests and MLR property.

CO2: Understand UMP and UMPU test with their applications.

CO3: Construct asymptotic confidence interval of a parameter and its relation with testing of hypothesis problem.

CO4: Execute small, large sample size tests and non-parametric tests in real life problems.

Unit	CC-2307B: THEORY OF TESTING OF HYPOTHESIS	No. of hours per unit / credits	Credits
Unit I	Problem of testing of Hypothesis, Simple and composite hypotheses. Randomized and non- randomized tests, Most powerful test, Neyman-Pearson Lemma and its applications. Determination of minimum sample size to achieve the desired strengths. Monotone likelihood ratio property, UMP test, power function of a test, existence of UMP. Tests for one-sided alternatives. Concept of p- value.	15	1
Unit II	UMP tests for two sided alternatives examples, their existence and non- existence. Generalized Neyman Pearson lemma, unbiased test, UMPU test and their existence in the case of exponential families (Statements of the theorems only). Similar tests, test with Neyman structure.	15	1
Unit III	Problem of confidence intervals, relation with testing of hypotheses problem, shortest length confidence intervals, UMA and UMAU confidence intervals.	15	1
Unit IV	Likelihood ratio test and its application to standard distribution. Goodness of fit tests based on Chi-square distribution and application to contingency tables. Spearman's Rank Correlation Test; Kendall's Rank Correlation Test; Kruskal-Wallis Test; Fridman's Two-way analysis of variance by ranks.	15	1

Books Recommended:

1. V. K. Rohatgi, and A. K. MD. E. Saleh (2015): Introduction to Probability Theory and Mathematical Statistics, John Wiley & sons, 3rd Edition.
2. B. K. Kale, and K. Muralidharan (2015), Parametric Inference: An Introduction, Alpha Science International Ltd.
3. E. J. Dudewicz and S. N. Mishra (1988): Modern Mathematical Statistics, John Wiley and Sons.
4. E. L. Lehmann (1983): Theory of Point Estimation, John Wiley & sons.
5. T. S. Ferguson, Mathematical Statistics (1967): A decision theoretical approach, Academic press.
7. S. Zacks (1971): Theory of Statistical Inference, John Wiley and Sons, New York.
8. R. H. Randles (1979): and D. A. Wolfe, Introduction to theory of nonparametric Statistics,

Wiley.

9. J. D. Gibbons and S. Chakraborti(2010): Nonparametric Statistical Inference, CRC Press, Fifth Edition.

CC-2308B: Linear Models and Regression Analysis.

CO1: Understand General linear model, Gauss Markov theorem, variances and covariance's of BLUEs.

CO2: Understand and apply multiple regression models in real life situations.

CO3: Understand concept of multicollinearity and non-linear regression.

CO4: Understand concept of Robust regression.

Unit	CC-2308B: Linear Models and Regression Analysis.	No. of hours per unit / credits	Credits
Unit I	General linear model: definition, assumptions, concept of estimability, least squares estimation, BLUE, estimation space, error space, Gauss Markov theorem, variances and covariances of BLUEs, Distribution of quadratic forms for normal variables: related theorems (without proof), Tests of hypotheses in general linear models. Description of the ANOVA and linear regression models as the particular cases of the general linear model.	15	1
Unit II	Multiple regression model, Least squares estimate (LSE), Properties of LSE, Hypothesis testing, confidence and prediction intervals, General linear hypothesis testing. Dummy variables and their use in regression analysis. Model adequacy checking. Transformations to correct model inadequacies: VST and Box-Cox power transformation.	15	1
Unit III	Multicollinearity: Consequences, detection and remedies, ridge regression. Autocorrelation: sources, consequences, detection (Durbin-Watson test) and remedies. Parameter estimation using Cochrane-Orcutt method. Variable Selection Procedures: Rsquare, adjusted R-square, Mallows' Cp, forward, backward and stepwise selection methods, AIC, BIC.	15	1
Unit IV	Robust Regression: need for robust regression, M-estimators, properties of robust estimators: breakdown and efficiency. Asymptotic distribution of M-estimator (Statement only). Nonlinear Regression Models: nonlinear least squares, transformation to a linear model, parameter estimation in a nonlinear system, linearization. Polynomial regression model, piecewise polynomial fitting.	15	1

Books Recommended:

1. Kshirsagar A. M. (1972): Multivariate Analysis. Marcel-Dekker.
2. Johnson, R.A. and Wichern. D.W (2002): Applied multivariate Analysis. 5th Ad. Prentice – Hall.
3. Anderson T. W. (1984): An introduction to Multivariate statistical Analysis 2nd Ed. John Wiley.
4. Morrison D.F. (1976): Multivariate Statistical Methods McGraw-Hill.

CC-2309B: DESIGN AND ANALYSIS OF EXPERIMENT

Course Objectives: At the end of the course students will be able to:

CO1: Memorize the basic concepts of design of experiments, concept of confounding.

CO2: Analyse different factorial and fractional experiments their interactions, graphical representation and confounding.

CO3: Describe the concept of fractional factorial design.

CO4: Understand the concept of response surface and methods of fitting it.

Unit	CC-2309B: DESIGN AND ANALYSIS OF EXPERIMENT	No. of hours per unit / credits	Credits
Unit I	Concept of design of experiments (DOE), applications of DOE; Basic principles of DOE; Analysis of completely randomized design using the fixed effect model and estimation of the model parameters; Contrasts, orthogonal contrasts, Scheffe's method for comparing contrasts; Comparing pairs of treatment means: controlling false discovery rate, Tukey's test, Fisher least significant difference method; Comparing treatment means with a control; Analyses of randomized complete block design, Latin square design, balanced incomplete block design using fixed effect models and estimation of the model parameters.	15	1
Unit II	Concepts of factorial designs, main effects, and interaction effects; The two-factor factorial design and its analysis using fixed effect model; The general factorial design; Analysis of replicated and unreplicated 2^k full factorial designs; Blocking and confounding in a 2^k factorial design; Construction and analysis of 2^{k-p} fractional factorial designs and their alias structures; Design resolution, resolution III and resolution IV designs; fold over designs; saturated designs.	15	1
Unit III	The 3^k full factorial design and its analysis using fixed effect model; Confounding in 3^k factorial designs; Construction and analysis of 3^{k-p} fractional factorial designs and their alias structures; Factorials with mixed levels: factors at two and three levels, factors at two and four levels; Design optimality criteria; Concept of random effects and mixed effects models, analysis of 2^k factorial designs using the random effect model, analysis of 2^k factorial designs using the mixed effect model, rules for expected mean squares, approximate F-tests.	15	1
Unit IV	Response surface methodology: the method of steepest ascent, analysis of the response surface using first and second order model, characterizing the response surface,	15	

	ridge systems, multiple responses, designs for fitting response surfaces: simplex design, central composite design (CCD), spherical CCD, Box–Behnken design; Robust parameter design: crossed array designs and their analyses, combined array designs and the response model approach; The concepts of nested and split-plot designs.		1
--	--	--	---

Books Recommended:

1. Montgomery D.C. (2017): *Design and Analysis of Experiments*, 9th edition, John Wiley & Sons, Inc.
2. Phadke, M. S. (1989). *Quality Engineering using Robust Design*, Prentice-Hall.
3. Voss, D., Dean, A., and Dean, A. (1999). *Design and Analysis of Experiments*, Springer verlag Gmbh.
4. Wu, C. F., Hamada M. S. (2000). *Experiments: Planning, Analysis and Parameter Design Optimization, 2nd edition*, John Wiley & Sons.

CC-2310B: SAMPLING THEORY

Course Objectives: At the end of the course students will be able to:

CO1: Understand the basic concept of random sampling and different methods of sampling.

CO2: Apply unequal probability sampling designs viz. PPSWR, PPSWOR including Lahiri's method and Murthy's estimator for survey.

CO3: Implement Cluster sampling, Two –stage sampling, Multistage sampling, Ratio and Regression estimation in real life problems.

CO4: Recognize non-sampling error, Response and non-response errors. Apply different model and technique to overcome errors.

Unit	CC-2310B: SAMPLING THEORY	No. of hours per unit / credits	Credits
Unit I	Review of concept Simple random sampling with replacement (SRSWR) and Simple random sampling without replacement (SRSWOR), results related to SRSWR and SRSWOR, estimation of sample size. Stratified sampling: Stratification, allocation and estimation problems, comparison with SRS, post stratification, construction of strata, deep stratification, method of collapsed strata, Review of concept of Systematic sampling: linear systematic sampling and circular systematic sampling, Comparison with SRS, and Stratified sampling.	15	1
Unit II	PPSWR methods: Cumulative total method, Lahiri's method related estimation Problems and PPSWOR methods and related estimation of a finite population mean (Horwitz-Thompson and Des Raj estimators for a general sample size and Murthy's estimator for a sample of size 2, Midzuno sampling, Rao-Hartley-Cochran sampling Strategy.	15	1
Unit III	Use of supplementary information for estimation: ratio and regression estimators and their properties. Unbiased and almost unbiased ratio type estimators, Double sampling. Cluster sampling. Two–stage sampling with equal number of Second stage units, multistage-sampling. Stratification estimator, Multiphase sampling.	15	1
Unit IV	Non-sampling errors: Response and non-response errors. Hansen–Hurwitz and Deming's model for the effect of call-backs. Random response techniques, dichotomous population, Warners model, MLE in Warners model, unrelated question model, polychotomous population: use of binary and vector response, binary response and unrelated questions, Multiattribute situations.	15	1

Books Recommended:

1. Parimal Mukhopadhyay, Theory and methods of survey sampling, Prentice Hall of India private limited, 2nd Edition, 2008.
2. P. V. Sukhatme, S. Sukhatme & C Ashok, Sampling Theory of surveys and applications, Iowa university press and Indian society of agricultural statistics, New Delhi, 1984.
3. Chaudhuri and H. Stenger, Survey Sampling: Theory and Methods, Chapman and Hall/CRC, 2nd edition, 2005.
4. Des Raj and Chandhok. P., Sample Survey Theory, Nanopublications, 1998.
5. William G. Cochran, Sampling Techniques, John and Wiley sons Inc, IIIrd edition 1977.
6. M. N. Murthy, Sampling Theory of Methods, Statistical Publishing Society, Calcutta, 1977.
7. D. Singh and F. S. Chaudhary, Theory and Analysis of Sample Survey Designs, Wiley Eastern Limited, 1986.
8. S. Singh, Advance Sampling Theory and Applications (Volume I and II), Kluwer Academic Publishers, 2003.

CCPR-2311B: PRACTICAL -II

Course Objective: Students should to understand and implement theory in real life problems.

Practical Number	Practical Name
1	MP, UMP, and UMPU Tests
2	Likelihood ratio tests
3	Confidence Intervals
4	Non-parametric Tests
5	Linear Estimation: Estimation and Hypothesis testing
6	Multiple linear regression
7	Variable selection, Multicollinearity and Autocorrelation
8	Robust regression and nonlinear regression
9	Analysis of CRD, RBD, LSD
10	Analysis of BIBD
11	Analysis of full, confounded and fractional 2^k factorial designs
12	Analysis of full, confounded and fractional 3^k factorial designs
13	Response surface methodology and robust parameter designs
14	Simple random sampling.
15	Stratified, Systematic and cluster Sampling.
16	Ratio, regression method of estimations.
17	Des-Raj, Murthy's and Horvitz-Thompson estimators.
18	Multi-stage sampling
19	Non-sampling errors.

(Each practical should consist of problems to be solved using at least two of the following software: EXCEL/ R/python)

Nature of Theory Question Paper:

Time: 3 hours

Total Marks: (70)

Instructions: (1) All the questions are compulsory.

(2) Figures to the **right** indicate **full** marks.

(3) (Paper setter may add or delete any instruction if required)

Question Number	Pattern of Question	Marks
Q.1	Select correct Alternative (8 questions carrying 1 mark each)	1 X 8 =8
Q.2	Attempt any three i) ii) iii) iv) v)	16 X 3 =48
Q.3	Attempt any four i) ii) ii) iv) v) vi)	6 X 4 =24
	Total	80

Nature of Practical Question Paper:

a) For Semester I and II, "Practical CCPR-2305, CCPR-2311,

- 1) There shall be 20 marks for day-to-day performance and journal.
- 2.) Examination (60): Practical Examinations will be conducted at the end of the term. Practical exam will be of 3 hrs. duration carrying 60 marks. There shall be 8 questions each of 12 marks, of which a student has to attempt any 5 questions.
- 3) Practical VIVA will be for 20 marks.

b) For Semester III and IV: Practical CCPR-2319, CCPR-2327

1. There shall be 10 marks for day-to-day performance and journal.
2. Examination (50): Practical Examinations will be conducted at the end of the term. Practical exam will be of 3 hrs. duration carrying 50 marks. There shall be 7 questions each of 10 marks, of which a student has attempt any 5 questions.
3. Practical VIVA will be for 10 marks.
4. Project work carries 60 marks.

Semester		Marks	Total Marks
III	Search & Define Problem	10	30
	Data Collection, Variable Understanding	10	
	Exploratory Data Analysis	10	
IV	Data Analysis	10	30
	Project Report	10	
	PPT and VIVA	10	

Note: The Master in Statistics Practical (MSP) examination shall be conducted semester wise with individual heads of passing with minimum 40% marks.

Nature of Internal Assessment:

There shall be Continuous Internal Evaluation pattern as follows:

1	Attendance	5 Marks
2	Seminar	15 Marks
3	Internal exam	20 Marks

Conversion of 40 marks into 20 marks.

SHIVAJI UNIVERSITY, KOLHAPUR



NAAC "A++" Grade with CGPA 3.52

Choice Based Credit System with Multiple Entry and Multiple Exit Option (NEP-2020)

Syllabus for

Master of Science

In

Computer Science

(Under Faculty of Science and Technology)

PART I SEMESTER I & II

(Syllabus to be implemented from Academic year 2022-23)

Choice Based Credit System with Multiple Entry and Multiple Exit Option (NEP-2020)
M.Sc. Program Structure
M.Sc. Part – I (Level-8)

SEMESTER-I (Duration- Six Month)											
	Sr. No.	CourseCode	Teaching Scheme			Examination Scheme					
			Theory and Practical			University Assessment (UA)			Internal Assessment (IA)		
			Lectures (Per week)	Hours (Per week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours
CGPA	1	CC-101: Design and Analysis of Algorithm	4	4	4	80	32	3	20	8	1
	2	CC-102: Python Programming	4	4	4	80	32	3	20	8	1
	3	CC-103: Database Management System	4	4	4	80	32	3	20	8	1
	4	CC-104: Cyber Security	4	4	4	80	32	3	20	8	1
	5	CCPR-105: Python Lab	-	6	4	100	40	3	--	--	*
	6	CCPR-106: Database Lab	-	6	4	100	40	3	--	--	*
Total (A)			16	28	24	520	--	--	80	--	--
Non-CGPA	1	AEC-107: Communicative English-I	2	2	2	--	--	--	50	20	2
SEMESTER-II (Duration- Six Month)											
CGPA	1	CC-201: Web Technology	4	4	4	80	32	3	20	8	1
	2	CC-202: Advanced Java	4	4	4	80	32	3	20	8	1
	3	CC-203: Android development with Kotlin	4	4	4	80	32	3	20	8	1
	4	CCS-204: 1. Software Project Management	4	4	4	80	32	3	20	8	1
						1016					

		2.Data Science Foundation 3.Application Security Analyst 4.Cloud Computing									
	5	CCPR-205: Web Technology Lab and Advanced Java Lab	-	6	4	100	40	3	--	--	*
	6	CCPR-206: Project	-	6	4	100	40	3	--	--	*
Total (B)			--	--	24	520	--	--	80	--	--
Non-CGPA	1	SEC-207	2	2	2	--	--	--	50	20	2
Total (A+B)					48	1040	--	--	160	--	--

<ul style="list-style-type: none"> • Student contact hours per week : 56 Hours (Min.) • Theory and Practical Lectures : 60 Minutes Each • CC-Core Course • CCPR-Core Course Practical • AEC-Mandatory Non-CGPA compulsory Ability Enhancement Course • SEC- Mandatory Non-CGPA compulsory Skill Enhancement Course 	<ul style="list-style-type: none"> • Total Marks for M.Sc.-I : 1040 • Total Credits for M.Sc.-I (Semester I & II) : 48 • Practical Examination is Semester wise after theory examination. • Examination for CCPR-105 and CCPR-106 shall be based on Semester I Practical. • Examination for CCPR-205 and CCPR-206 shall be based on Semester II Practical. • *Duration of Practical Examination as per respective BOS guidelines • <i>Separate passing is mandatory for Theory, Internal and Practical Examination</i>
<ul style="list-style-type: none"> • Requirement for Entry at Level 8: Completed all requirements of the relevant Bachelor's degree (Level 7) . 	
<ul style="list-style-type: none"> • Exit Option at Level 8: Students can exit after Level 8 with Post Graduate Diploma in Computer Science if he/she completes the courses equivalent to minimum of 48 credits. 	

Choice Based Credit System with Multiple Entry and Multiple Exit Option (NEP-2020)
M.Sc.. Program Structure
M.Sc. Part – II (Level-9)

SEMESTER-III (Duration- Six Month)											
	Sr. No.	CourseCode	Teaching Scheme			Examination Scheme					
			Theory and Practical			University Assessment (UA)			Internal Assessment (IA)		
			Lectures (Per week)	Hours (Per week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours
CGPA	1	CC-301:Artificial Intelligence	4	4	4	80	32	3	20	8	1
	2	CC-302: Advanced Web Technology	4	4	4	80	32	3	20	8	1
	3	CC -303:PHP	4	4	4	80	32	3	20	8	1
	4	CCS-304: 1.Software Quality Assurance 2.Advance Data Science 3.Network Security Analyst 4.Internet of Things	4	4	4	80	32	3	20	8	1
	5	CCPR-305: Advanced Web Technology Lab	--	6	4	100	40	3	--	--	*
	6	CCPR-306: PHP Lab	--	6	4	100	40	3	--	--	*
	6	CCPR-307: Project	--	6	4	100	40	3	--	--	*
Total (C)			--	--	28	620	--	--	80	--	
Non-CGPA	1	AEC-308: Communicative English-II	2	2	2	--	--	--	50	20	2
	2	EC(SWMMOOC)-309:	Number of Lectures and credit shall be specified on SWAYAM MOOC								
SEMESTER-IV (Duration- Six Month)											
CGPA	1	CCPR-401:Research Seminar		1	4				100	40	*
	6	CCPR-402: Research /Industrial		-	16	300	120	--	100	40	*

		Project								
	Total (D)		--	1	20	300	--	--	200	--
	1	GE-403:	2	2	2	--	--	--	50	20
Total (C+D)					40	920	--	--	280	--

<ul style="list-style-type: none"> • Student contact hours per week : 34 Hours (Min.) • Theory and Practical Lectures : 60 Minutes Each 	<ul style="list-style-type: none"> • Total Marks for MSc.-II : 1200 • Total Credits for MSc.-II (Semester III & IV) : 48
<ul style="list-style-type: none"> • CC-Core Course • CCS- Core Course Specialization • CCPR-Core Course Practical and Project • DSE-Discipline Specific Elective • AEC-Mandatory Non-CGPA compulsory Ability Enhancement Course • SEC- Mandatory Non-CGPA compulsory Skill Enhancement Course • EC (SWM MOOC) - Non-CGPA Elective Course • GE- Multidisciplinary Generic Elective 	<ul style="list-style-type: none"> • Practical Examination is Semester wise after theory examination. Examination for CCPR-305 and CCPR-306 shall be based on Semester III Practical. • Examination for CCPR-401 and CCPR-402 shall be based on Semester IV Practical. • *Duration of Practical Examination as per respective BOS guidelines • Separate passing is mandatory for Theory, Internal and Practical Examination
<ul style="list-style-type: none"> • Requirement for Entry at Level 9: Completed all requirements of the relevant Post Graduate Diploma in Computer Science (Level 8) 	
<ul style="list-style-type: none"> • Exit at Level 9: Students will exit after Level 9 with Master's Degree in Computer Science if he/she completes the courses equivalent to minimum of 96 credits. 	

	M.Sc. I	M.Sc. II	Total
Marks	1200	1200	2400
Credits	48	48	96

The name of the programme shall be Master of Science (**M.Sc. in Computer Science**)

Duration of the Program

- The M.Sc. programme will be a full-time two years i.e. 4 semesters. Pattern of examination will be Semester System.

Medium of Instruction

- The medium of Instruction will be English only.

Admission Procedure

- Eligibility: B.Sc. Computer Science (Entire/ optional) / B.Sc. IT/ BCA, B.Sc. Mathematics, B.Sc. Statistics, B.Sc. Electronics, B.Sc Animation, B.Sc Physics, B.Sc Chemistry/ BSc. Microbiology.
- Admission through University Entrance exam only.
- Only entrance marks should be considered for admission process.
- Reservation of Seats as per rules of Government of Maharashtra.

Project work

At the end of I, II & III semester student has to carry out a project work.

1. Project work at end of semester should be done in groups, each student must be given a responsibility for a distinct module and care should be taken to see the progress of individual modules is independent of others.
2. Students should take guidance from an internal guide and prepare a Project Report on "Project Work" to be submitted to the Department after evaluation.
3. The Project Report should contain an Introduction to Project, which should clearly explain the project scope in detail. Database/Webpage/ UI designs and a list of output reports should be included along with references.
4. The project Work should be of such a nature that it could prove useful or should be relevant from the societal/commercial/research angle.
5. The project report will be duly accessed by the internal guide of the project and internal marks will be communicated by the concerned guide.
6. Project viva-voce by the University panel will be conducted as part of Evaluation.

At the end of the Fourth semester of study, a student will be examined in the course "Industrial / Research Project ".

1. Fourth semester Project work can be carried out as industrial training of four months in the Industry or in the Institute as Research project with prior permission of the Institute.
2. Project viva-voce by the University panel will be conducted at the end of semester.
3. The project report should be prepared in a format prescribed by the University, which also specifies the contents and methods of presentation.
4. Project work may be done individually or in groups in case of bigger projects.

5. The major project work carry 50 marks for internal assessment and 150 marks for External viva. The external viva shall be conducted by a panel of external examiners.

OR

1. The student will be allowed to formulate a proposal for start-up and the same will be rated equivalent to an industrial project. A detailed problem statement showing innovation along with markability, business plan and cash flow will be part of the Evaluation criteria.

Research Seminar

At the end of fourth semester student shall deliver seminar on one of the advanced topic chosen in consultation with the guide after compiling the information from the latest literature and also internet. The concepts must be clearly understood and presented by student. Prior to presentation, he/she shall carry out the detailed literature survey from standard references such as International & National journals and periodicals recently published reference books etc. A hard copy of the report (A4 size, 12 fonts, Times New Roman, Single spacing both side printed) should be submitted to the Department before delivering the seminar. This seminar will be evaluated internally for 100 marks by the respective guides.

Assessment

The final total assessment of the candidate is made in terms of an internal assessment and an external assessment for each course.

1. For each theory paper, 20% marks will be based on internal assessment and 80% marks for semester examination (external assessment), unless otherwise stated.
2. Internal assessment of theory papers should be in the form of two internal tests of 10 marks each. Total 20 marks.
3. The projects will be evaluated by the university appointed panel.
4. The final practical examination will be conducted by the university appointed panel at the end of semester for each lab course and marks will be submitted to the university by the panel. The pattern of final Practical Examination will be as follows-

1	Coding and Execution of Program	60 Marks
2	Viva-voce	20 Marks
3	Journal	20 Marks
	Total	100 marks

6. The internal marks will be communicated to the University at the end of each semester, but before the semester end examinations. These marks will be considered for the declaration of the results.

Nature of question paper

Nature of question paper is as follows for University end semester examination

a. **Theory Examination:** There will be seven (7) questions of 16 Marks and out of which four (4) to be attempted from question no 2 to 6. Question No.1 is compulsory and is of multiple choice questions.

b. Practical Examination:

- i. Duration of Practical Examination: 3 Hrs
- ii. Nature of Question paper: There will be three questions out of which any two questions to be attempted and each question carries 30 Marks.

Standard of Passing

Internal as well as external examination will be held at the end of semester. The candidate must score 40% marks in each head of internal as well as external Examination.

Board of Paper Setters /Examiners

For each Semester and examination there will be one board of Paper setters andexaminers for every course.

Award of Class

There will be numerical marking on each question. At the time of declaration of the result the marks obtained by the candidate is converted into classes as per University norms.

Credit system implementation

As per the University norms

Clarification of Syllabus

The syllabus Committee should meet at least once in a year to study and clarify any difficulties from the Institutes. The Workshop on syllabi should be organised at the beginning of every semester.

Revision of Syllabus

As the computer technology is changing very fast, revision of the syllabus should be considered every 3 years.

PEO's for M.Sc. Program

Program Educational Objectives is to prepare graduates to:

1. Apply and continuously acquire knowledge, both theoretical and applied, related to core areas of computer science
2. Demonstrate the ability to work effectively as a team member and/or leader in an ever-changing professional environment
3. Work productively as computer professionals (in traditional careers, graduate school, or academia) by demonstrating effective use of oral and written communication, working competently as a member of a team unit, adhering to ethical standards in the profession.

Program Outcomes (POs)

At the end of the Master of Science (Computer Science) Programme, graduating students/graduates will be able to:

1. Communicate computer science concepts, designs, and solutions effectively and professionally
2. Apply knowledge of computing to produce effective designs and solutions for specific problems
3. Identify, analyse, and synthesize scholarly literature relating to the field of computer science Use software development tools, software systems, and modern computing platforms.
4. Prepare for academic roles through NET/SET/PhD
5. Apply design and development principles in the construction of software systems of varying complexity.

Program Specific Outcomes (PSOs)

1. Demonstrate understanding of the principles and working of the hardware and software aspects of computer systems.
2. Ability to understand the structure and development methodologies of software systems.
3. Possess professional skills and knowledge of software design process. Familiarity and practical competence with a broad range of programming language and open source platforms.
4. Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions to existing problems.

M.Sc-I Semester-I (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)

Course Code: CC-101

Title of Course: Design and Analysis of Algorithms

Syllabus to be implemented from Academic Year 2022-23

Course outcomes:

1. Analyse the asymptotic performance of algorithms.
 2. Demonstrate a familiarity with data structures and algorithms.
 3. Compare algorithms based on time & space complexity.
 4. Employ graphs to model real life problems, when appropriate. Develop algorithms that employ graph computations as key components, and analyse them.
 5. Mapping of data structures like Stack, Queue and Linked List to real life problems.
 6. Be familiar with advanced data structures such as balanced search trees, hash tables, Red-Black trees, Btrees.
 7. Understand Divide & Conquer approach, Greedy algorithm, Backtracking approach for algorithm design.
-

UNIT-I

[15]

Algorithm Analysis: Introduction to algorithms, analysing and designing algorithms, Growth functions, asymptotic notations, Analysis of recursive algorithms, solving recurrences: Substitution method, recursion tree method, master method. Binary Search, Sorting (Merge Sort, Quick Sort).

Hashing: Hashing, Direct address tables, Hash tables, Hash functions, collision resolution techniques.

Unit-II

[15]

Data Structures: Stacks, Queues, Linked list, Trees, Binary tree, Binary search tree, operations on binary search tree, AVL tree, Red-Black Trees, B-trees. **Graphs:** Representations of graph, Traversing Graphs, Breadth-first search, Depth-First Search, topological sort.

Unit-III

[15]

Greedy Algorithm: General Characteristics of greedy algorithms, Problem solving using Greedy Algorithm - Activity selection problem, Elements of Greedy Strategy, Minimum Spanning trees (Kruskal's algorithm, Prim's algorithm), Shortest paths, The Knapsack Problem, Job Scheduling Problem, Huffman code.

Unit-IV

[15]

Divide and conquer: The maximum sub array problem, matrix multiplication, Max-Min problem **Backtracking:** Introduction, N Queen Problem, Subset Sum, Hamiltonian Cycle

Branch and Bound – Introduction, 0/1 Knapsack, Travelling Salesman problem,

Dynamic programming: Introduction, Tabulation, memoization, Optimal Substructure Property in Dynamic Programming

References:

1. Introduction to algorithms, Third Edition. by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, PHI
2. Fundamentals of Computer Algorithms, Second edition. By Ellis Horowitz, Sartaj Sahani, Sanguthevar Rajasekaran, University Press.
3. Data structures and algorithm analysis in C, Second edition. By Mark Allen weiss
4. Fundamental algorithms by Donald E. Knuth, Pearson Education.

M.Sc-I Semester-I (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)

Course Code: CC-102
Title of Course: Python Programming

Syllabus to be implemented from Academic Year 2022-23

Course Outcomes:

1. Understand principles of Python
 2. Understand object oriented programming
 3. Demonstrate file handling techniques
 4. Understand how Python can be used for application development
 5. Design Real life problems and think creatively about solution of them
 6. Apply a solution clearly and accurately in a program using python
-

Unit-I

(15 hrs)

Installing Python, Simple program using Python, Expressions and Values, Variables and Computer Memory, error detection, Multiple line statements, Designing and using functions, functions provided by Python, Tracing function calls in memory model, omitting return statement. Working with Text: Creating Strings of Characters, Using Special Characters in Strings, Creating a Multiline String , Printing Information, Getting Information from the Keyboard

Unit-II

(15 hrs)

A Boolean Type, Choosing Statements to Execute, Nested If Statements, Remembering the Results of a Boolean Expression Evaluation, A Modular Approach to Program Organization, Importing Modules , Defining Modules, Testing Code Semi automatically Grouping Functions Using Methods: Modules, Classes, and Methods , Calling Methods the Object-Oriented Way, Exploring String Methods, Underscores.

Unit-III

(15hrs)

Storing Collections of Data Using Lists: Storing and Accessing Data in Lists, Modifying Lists, Operations on Lists, Slicing Lists, Aliasing, List Methods, Working with a List of Lists. Repeating Code Using Loops: Processing Items in a List, Processing Characters in Strings, Looping Over a Range of Numbers, Processing Lists Using Indices, Nesting Loops in Loops, Looping Until a Condition Is Reached, Repetition Based on User Input, Controlling Loops Using Break and Continue Reading and Writing Files: Kinds of files, Opening a File, Techniques for Reading Files, Files over the Internet, Writing Files, Writing Algorithms that use the File- Reading Techniques, Multiline Records

Unit-IV

(15hrs)

Storing Data Using Other Collection Types: Storing Data Using Sets, Storing Data Using Tuples, Storing Data Using Dictionaries, Inverting a Dictionary
Creating Graphical User interface: Building a Basic GUI, Models, Views, and Controllers, Customizing the Visual Style Widgets, Object-Oriented GUIs, Regular expressions Databases: Overview, Creating and Populating, Retrieving Data, Updating and Deleting, Using NULL for Missing Data, Using Joins to Combine Tables, Keys and Constraints.

References:

1. Practical Programming: An introduction to Computer Science Using Python, second

- edition, Paul Gries, Jennifer Campbell, Jason Montojo, The Pragmatic Bookshelf.
2. Python for Informatics: Exploring Information, Charles Severance
 3. Learning Python, Fourth Edition, Mark Lutz, O'Reilly publication
 4. Introduction to Python for Computational Science and Engineering (A beginner's guide), Hans Fangohr
 5. John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India
 6. R. Nageswara Rao, "Core Python Programming", Dreamtech

M.Sc-I Semester-I (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)

Course Code: CC-103
Title of Course: Database Management System

Syllabus to be implemented from Academic Year 2022-23

Course Outcomes:

After successful completion of the course, the student will be able to

1. Define the terminology, features, classifications, and characteristics embodied in database systems.
 2. Demonstrate an understanding of the relational data model.
 3. Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
 4. Formulate, using SQL, solutions to a broad range of query and data update problems.
 5. Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
 6. Use an SQL interface of a multi-user relational DBMS package to create, secure, populate, maintain, and query a database.
 7. Use PL/SQL for handling data in a database as per the user's requirement using programming features.
 8. Define various cursors and its implementation along with procedure and functions.
-

UNIT-I

[15]

Introduction to DBMS: Database Concept, Characteristics and architecture of DBMS, Database users, 3-tier architecture of DBMS-its advantages over 2-tier, Views of data – Schemas and instances, Data independence. Data models: Conventional data models, NDM & HDM, Physical Data Organization-Hashed files, Indexed files, B-trees

UNIT-II

[15]

Database Design and E-R Model: Entities, Attributes, Relationships, Representation of entities, relationship set, Generalization, aggregation Structure of relational Database and different types of keys, E-R diagrams, E-R design Issues in Relational database design, Functional dependencies. Normalization and Database Recovery systems: Codd's rules, Normalization, Database Recovery System- Failure classification, storage structure, recovery and atomicity, log-based recovery. Role of DBA.

UNIT-III

[15]

Introduction to RDBMS: History, Generations and characteristics, difference between DBMS & RDBMS. Data constraint- primary key, foreign key, unique key, null, not null, default key etc. SQL: Introduction to SQL, Features of SQL, Basic data types, SQL statements/commands, Set operations in SQL, order by and group by clause, like between, in, like, create index, view and join command Nested queries, GRANT and REVOKE, Commit, Rollback, Save point. Join concept: Simple, Equi, non-equi, Self, Outer join. View-Introduction, Create, Update, Drop, Index. SQL functions: MAX, MIN SORT, COUNT, AVERAGE, Numeric, String, Date Functions, Type conversion functions.

UNIT-IV

[15]

Introduction to PL /SQL: Introduction, Difference between SQL AND PL/SQL, Block definition structure and Data types, Block Functions - %Type, %Row Type, Control

statements, Looping statements and sequential statement, Exception handling. Simple PL/SQL blocks.

Cursor management: meaning, types and importance, implicit and explicit cursor management using simple example. Trigger: meaning importance and types of trigger, examples using trigger Procedures-Definition, creating procedures, passing parameters. Function-Definition, syntax and calling methods, passing parameters.

Reference Books -

1. Introduction to database systems C. J. Date Pearsons Education 8th
2. Database system concept Korth, Silberschatz and Sudarshan MGH 5th
3. Fundamentals of Database Systems Elmasri Navathe PearsonEducation5th
4. SQL /PL SQL For Oracle 11G BlackBook Dr.Deshpande WileyDreamtech2012
5. ORACLE PL/SQL Programming Scott Ulman TMH 9th
6. SQL, PL/SQL the programming language of Oracle Ivan Bayross BPB 4th
7. Advance Database Management System
Chakrabharati/DasguptaWileyDreamtech2011
8. Understanding SQL Martin Gruber BPB 2nd
9. SQL Scott Ulman TMH 4th

M.Sc-I Semester-I (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
Course Code: CC-104
Title of Course: Cyber Security

Syllabus to be implemented from Academic Year 2022-23

Course Outcomes:

- 1) Realize the need for Cyber Security
 - 2) Understand the need for Security in day to day communications
 - 3) Understand the vulnerabilities in the Network and Computer System
 - 4) Understand the cyber law and Cyber Forensics
-

Unit-I

(15 hr)

Introduction to Cyber Security: Overview of Cyber Security, Cyber Threats:- Cyber Warfare-Cyber Crime-Cyber terrorism-Cyber Espionage, Cyber Security Vulnerabilities and Cyber Security Safeguards :Cyber Security Vulnerabilities-Overview, vulnerabilities in software, System administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication. Cyber Security Safeguards- Overview, Access control, Audit, Authentication, Biometrics, Cryptography, Deception, Active attacks: Phishing, Sniffing,spoofing, Denial of service attack. Ethical Hacking, Detection Systems, Response, Scanning, Security policy, Threat Management.

Unit-II

(15 hr)

Securing Web Application, Services and Servers: Introduction, Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations, Challenges. Intrusion Detection and Prevention: Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management, Network Session Analysis.

Unit –III

(15 hr)

Cryptography and Network Security: Introduction to Cryptography, Symmetric key Cryptography, Asymmetric key Cryptography, Message Authentication, Digital Signatures, Applications of Cryptography. Overview of Firewalls- Types of Firewalls, VPN Security Protocols: - security at the Application Layer- PGP and S/MIME, Security at Transport Layer- SSL and TLS, Security at Network Layer-IPSec.

Unit –IV

(15 hr)

Cyberspace and the Law: Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013.Cyber Forensics: Introduction to Cyber Forensics, Handling Preliminary Investigations, Controlling an Investigation, Conducting disk-based analysis, Investigating Information-hiding, E-mail Security: Encryption for SecureE-mail.

References:

1. Preston Gralla, How Personal and Internet Security Work, Que Publications
2. Alfred Basta and Wolf Halton, Computer Security Concepts, Issues and Implementation, Cengage Learning
3. Digital Defense: A Cybersecurity Primer by Joseph Pelton , Indu B. Singh
4. Cryptography and Network Security: Principles and Practice by William Stallings
5. Computer and Information Security Handbook by John R. Vacca .
6. Cyberlaw: The Law of the Internet and Information Technology by Brian Craig .
7. Cyber Warfare: Techniques, Tactics and Tools for Security Practitioners 2nd Edition by Jason Andress (Author), Steve Winterfeld (Author)
<https://www.studocu.com/en/document/edith-cowan-university/computer-security/lecture-notes/lecture-notes-lectures-1-8-computer-security-notes/709625/view>

M.Sc-I Semester-I (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)

Course Code: CCPR-105

Title of Course: Python Lab

Syllabus to be implemented from Academic Year 2022-23

Course outcomes:

1. Write, Test and Debug Python Programs
 2. Implement Conditionals and Loops for Python Programs
 3. Design and implement GUI application and how to handle exceptions and files
 4. Use List, Set, Tuples and Dictionaries
 5. Read and write data from & to files in Python
 6. Make database connectivity in python programming language
-

Lab assignments based on Python Programming course.

M.Sc-I Semester-I (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)

Course Code: CCPR-106

Title of Course: Database Lab

Syllabus to be implemented from Academic Year 2022-23

Course outcomes:

1. Create, modify and apply operations on table
 2. Handling different keys on database
 3. Handling different types of SQL queries on database
 4. Handling different types of mathematical and statistical functions
 5. Handling and write code using PL/SQL
 6. Handling cursor in in PL/SQL
-

Lab assignments based on Database Management System course.

M.Sc-I Semester-I (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)

Course Code: AEC-107

Title of Course: Commutative English-I

Syllabus to be implemented from Academic Year 2022-23

M.Sc-I Semester-II (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
Course Code: CC-201
Title of Course: Web Technology

Syllabus to be implemented from Academic Year 2022-23

Course Outcomes:

1. To familiarize a student with windows and web-based application
 2. To provide a student with the solid foundation of the syntax and semantics of C# as well as architecture of the .NET framework
 3. Debug and deploy ASP.NET web applications
 4. Discuss the insights of internet programming and implement complete application over the web
 5. To inculcate skills pertaining to data access technology geared to facilitate the development of disconnected systems using .NET platform.
 6. To familiarize the student with the development of windows-based application using C#
 7. To familiarize the student with the development of web-based application using ASP.NET
 8. Handle various toolkit like AJAX
 9. Utilize the concepts of JavaScript
-

UNIT - I **(15 Hrs)**

Introduction: .NET framework and its architecture, CLR, JIT, CTS, Metadata, .NET Revolution, Characteristics of C#, Programming structure of C#, scope of variables, boxing & unboxing, Nullable Data types, Conditional statements, Arrays, Loops, class, inheritance, polymorphism, Exception handling, delegates

UNIT- II **(15 Hrs)**

Introduction to C#: Windows form controls, containers, Data Controls, Dialog Controls, sample application development, Deployment of C# application
ASP.NET: Page Life Cycle, ASP.NET server-side Controls, Data Controls, Server- side Validation Controls, Language Integrated Queries (LINQ), Web services,

UNIT- III **(15 Hrs)**

State management: Server side & Client-side state management, Caching in ASP.NET: Page caching, data caching, fragment caching
AJAX: Introduction to AJAX, Various extenders of AJAX
ADO.NET: ADO.NET Architecture, ADO.NET namespaces, Working with ADO.NET, Data controls, FormView Control, Working with Repeater, connected architecture, Disconnected Architecture, Three-layer Architecture, Working with Master pages

UNIT- IV **(15 Hrs)**

Microsoft SQL Server: Database designing, Tables, Views, Stored Procedures, taking backup of database, creating script of database

Java Script: JavaScript Overview, Data types, variables, scope of variables, casting, data type conversion rules, Expressions and operators. Arrays. Built-in functions, and Built-in objects-String, Date, Math. Three types of dialog boxes-alert, prompt, confirm. Custom Functions.

References:

1. C# 4.0 The Complete Reference by Herbert Schildt
2. Essential C# 4.0” by Mark Michaelis and Eric Lippert
3. “C# in Depth” by Jon Skeet
4. “Head First C#: A Learner’s Guide to Real-World Programming with C#, XAML, and .NET” by Jennifer Greene and Andrew Stellman
5. “Microsoft Visual C# Step by Step” by Sharp John
6. “Let Us C#” by Yashavant P Kanetkar
7. Javascript: The Complete Reference by Thomas Powell & Fritz Schneider
8. JavaScript Pocket Reference, 3rd Edition By David Flanagan
9. Professional JavaScript for Web Developers, 4th Edition by Matt Frisbie

M.Sc-I Semester-II (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
Course Code: CC-202
Title of Course: Advanced Java

Syllabus to be implemented from Academic Year 2022-23

Course Outcomes:

1. The student will be able to develop distributed business applications, develop web pages using advanced server-side programming through servlets and Java server pages.
2. Demonstrate approaches for performance and effective coding
3. Develop Java client/server applications.
4. Develop distributed applications using RMI
5. Develop component-based Java software using JavaBeans
6. Develop server side programs in the form of servlet
7. Understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB) ,map Java classes and object associations to relational database tables with Hibernate mapping files
8. Understand Spring and Spring Boot Framework.

Unit -1

(15 Hrs)

Overview of Java programming, Java Servlets: Servlet basics, servlet life cycle , Generic and HTTP servlets, The Servlet API, javax.servlet and javax.servlet.http package, session tracking using session and cookies, web deployment descriptor, web.xml. Remote Method Invocation–Introduction, architecture, defining remote objects, creating stubs and skeleton, object serialization, dynamically loaded classes, RMI activation, registering remote objects, marshaled objects.

Unit-II

(15 Hrs)

Java Database Connectivity.JDBC overview,Architecture, Types of JDBC Drivers, DriverManager class, database connection statements,ResultSet, transaction, Metadata andAggregate functions , callable statements, Connection to various back ends. Java Server Pages (JSP): Introduction to JSP tags and directive, Request String, User Sessions, Cookies,Session objects.

Unit-III

(15 Hrs)

Java Beans: Basics of designing JavaBeans, Java Bean design patterns, creating and using properties, using events to communicate with other components. Enterprise Java Bean: Preparing a Class to be a JavaBean, Creating a JavaBean, JavaBean Properties,Types of beans, Stateful Session bean, Stateless Session bean, Entity bean

Unit –IV

(15 Hrs)

Spring and Hibernate: Spring API libraries, Designing spring applications. Building a simple application. Introduction to Spring Boot, Features of Spring Boot Spring Boot Architecture, Setup Spring Boot, creating application of spring boot.

References:-

1. Java 2 Complete Reference - (Tata McGraw Hill)
2. Java server pages
3. Java 2EE – Ivan Bayross (PHI)
4. Java 2 Black Book –(DreamTech)
5. Orfali, "The essential Distributed Object Survival Guide".
6. Valesky, "Enterprise Java Beans", Addison Wesley.

M.Sc-I Semester-II (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)

Course Code: CC-203

Title of Course: Android Development with Kotlin

Syllabus to be implemented from Academic Year 2022-23

Course outcomes:

- 1) Comprehend Kotlin language
 - 2) Understand Android Studio Environment and application structure.
 - 3) Demonstrate different layouts, views, activities and intents
 - 4) Design good user interface for the application.
 - 5) Able to store, retrieve and load data
 - 6) Demonstrate programming skills using Kotlin
-

Unit 1 – Introduction to Kotlin

[15hrs]

Kotlin basics: Introduction to Kotlin, Benefits of using Kotlin, Use Kotlin REPL to practice basic expressions, Control flow statements in Kotlin, Null safety with Kotlin. **Functions:** Creating and calling functions with default and named arguments, Writing concise and compact functions, Passing functions as arguments to other functions, Writing simple lambdas.

Classes and Objects: Introduction to object-oriented programming in Kotlin, Classes and objects in Kotlin, Constructors, Visibility modifiers, Subclasses and inheritance, Interfaces, Data classes, Singleton class enums, Pairs, triples and collections in Kotlin, Extensions in Kotlin

Unit 2 – Introduction to Android

[15hrs]

Build first Android app: Installing Android Studio, Creating an Android app project, Deploying the app to an emulator or a device, Building an Android app that contains images and a click handler, Modifying views within the layout of an app, Adding libraries to module gradle file. **Layouts:** Creating layouts in Android Studio using XML and the Layout Editor, Adding interactivity to your app, Working with ConstraintLayout, Data binding basics

App Navigation: Creating Fragments, Defining NavHostFragment, navigation graphs, navigational paths, Functionality of Back and Up buttons, Defining the options menu, Creating a navigational drawer, Using the Safe Args plugin and passing of arguments, Starting an external Activity.

Unit 3 – Android Application Architecture

[15hrs]

Activity and Fragment Lifecycles: Understanding Activity and Fragment Lifecycles, Exploring logging options in your app, Using the Android Lifecycle library, Exploring configuration changes

App Architecture (UI Layer) : Using the recommended Android App Architecture, Using the Lifecycle, ViewModel, and ViewModelFactory classes, Adding LiveData and

LiveData, observers, Adding Data Binding with ViewModel and LiveData, Adding LiveData, transformations

App Architecture (Persistence): Overview of Room Persistence Library, Introduction to coroutines, **Advanced RecyclerView use cases:** Introduction to RecyclerView Fundamentals,

Implementing data binding with RecyclerView, Using GridLayout with RecyclerView, Interacting with RecyclerView items, Adding headers in RecyclerView

Unit 4 – Connect to the Internet and App Design [15hrs]

Connect to the Internet: Connecting to a web service with the Retrofit library, Parsing aJSON response with the Moshi library, Using coroutines with Retrofit, Loading and displaying images from the Internet, Filtering data from the Internet.

Repository pattern and Work Manager: Adding an offline cache and repository, Implementing Work Manager, Working with background workers and periodic Worker Request

App UI Design: Introduction to basic app design, Understanding Styles and Themes, Implementing Material Design, Designing for everyone

References:

1. <https://developer.android.com/kotlin>
2. <https://developer.android.com/kotlin/getting-started-resources>
3. Kotlin for Android Developers: Learn Kotlin the Easy Way While Developing an Android App by , Antonio Leiva (Free ebook)
4. Learn Android Studio 3 with Kotlin: Efficient Android App Development by, Ted Hagos, Apress publisher.
5. [https:// www.shabakeh-mag.com/sites/default/files/files/attachment/1397/04/1530550032.pdf](https://www.shabakeh-mag.com/sites/default/files/files/attachment/1397/04/1530550032.pdf)

M.Sc-I Semester-II (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)

Course Code: CCS-204.1

Title of Course: Software Project Management

Syllabus to be implemented from Academic Year 2022-23

Course outcomes:

- 1) To understand Software Project Models and Software Management Concepts.
- 2) To understand the various methods of Cost Estimation.
- 3) To Study about Software Quality Management.
- 4) To Study about Emerging Trends in Software Management.
- 5) To understand Project Evaluation.

Unit-I

(15)

Project Management: Concept of project Management, Project Organization, Planning a software project, Project management life cycle, Risk management, Identification of Risks, Risk Analysis, Risk Planning and Monitoring.

Unit-II

(15)

Software Project Estimation: Concept of Project Estimation, Different methods of software project estimation (COCOMO model, Delphi cost estimation etc.), Function point analysis, Software Project Management Tools and Techniques- PERT & Gantt Charts

Unit-III

(15)

Software Quality Management and Testing: Quality Assurance and Standards, Quality Planning, Quality control, Role of testing in Software, development, Testing Procedure, Defect Management. Team Structure, Team Communication, Managing customer expectations, Group Behaviour.

Unit-IV

(15)

Project Evaluation and Emerging Trends : Strategic Assessment–Technical Assessment– Cost Benefit Analysis–Cash Flow Forecasting– Cost Benefit Evaluation Technique–Risk Evaluation– Software Effort Estimation. Emerging Trends: people Focused Process Models.

Reference:

1. Software Project management By Edwin Bennatan
2. Software Engineering By Roger S. Pressman
3. Software Engineering concepts by Richard Fairley
4. Software Project Management by S.A. Kelkar
5. Software Engineering by IAN Sommerville
6. System Analysis and Design Methods By J.L Whitten , L.D.Bentley and K.C. Dittman
7. Ramesh Gopaldaswamy , “Managing and global Software Projects”, Tata McGraw Hill Tenth Reprint, 2011.

M.Sc-I Semester-II (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
Course Code: CCS-204.2
Title of Course: Data Science Foundations

Syllabus to be implemented from Academic Year 2022-23

Course outcomes:

After successful completion of this course students are able to:

- 1) Understand the concept of Probability and Information Theory
- 2) Compute probabilities of events
- 3) Explain Bayes rule and compute probabilities using Bayes rule
- 4) To formulate and solve classification problem
- 5) To investigate clustering techniques for particular data
- 6) To mine frequent pattern in a dataset
- 7) To get acquainted with natural language processing techniques

Unit – I

(15hrs)

Probability and Information Theory: Introduction to Probability, Random Variables, probability Distributions, Marginal Probability, Conditional Probability, The Chain Rule of Conditional Probabilities, Independence and Conditional Independence, Expectation, Variance and Covariance, Common Probability Distributions, Useful Properties of Common Functions, Bayes' Rule, Information theory, Structured Probabilistic Models

Unit – II

(15hrs)

Data understanding and data cleaning, concept of supervised and unsupervised learning. Classification techniques: Classification: Preliminaries, general approach to solve classification problem, Decision tree induction, Rule-based classifier, Nearest-Neighbor classifier, Bayesian Classifiers, Support Vector Machine.

Unit – III

(15hrs)

Cluster analysis: Introduction, Types of Clustering, Types of Clusters. K-means algorithm, Agglomerative Hierarchical Clustering, DBSCAN, Prototype based clustering and Density based clustering, introduction to Web Mining. Association analysis: Problem definition, Frequent Itemset Generation, Apriori Principle, apriori algorithm, Maximal Frequent itemset, closed frequent itemset. FP-growth algorithm

Unit – IV

(15hrs)

Introduction to Natural Language Processing (NLP), Data Preparation: punctuation removal, stop-words removal, numeric value removal, frequent words removal, rare words removal, spelling correction, tokenization, stemming, lemmatization. Feature Engineering: count vectors as features, Term Frequency-Inverse Document Frequency (TF-IDF), TF-IDF vectors as features, word level TF-IDF, N-Gram level, TF-IDF, Character level TF-IDF, Inverse Document Frequency, word embedding as features, Text/NLP based features, Topic Models as features, word2vec.

References:

- 1) Bird, S., Klein, E., & Loper, E. (2009). *Natural language processing with Python: analyzing text with the natural language toolkit*. " O'Reilly Media, Inc."

- 2) Data Mining concepts and techniques --- Jiawei Han and Micheline Kamber , Elsevier
- 3) Data Mining: Introductory and Advanced Topics - Margaret H. Dunham, Pearson education
- 4) Data Mining: Practical Machine Learning Tools and Techniques, Ian H. Witten, Eibe Frank
- 5) Goodfellow, I., Bengio, Y., Courville, A., & Bengio, Y. (2016). *Deep learning* (Vol. 1). Cambridge: MIT press.
- 6) Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson education.
- 7) Kumar, E. (2013). *Natural language processing*. IK International Pvt Ltd.
- 8) Ross, S. M. (2014). *Introduction to probability models*. Academic press.

M.Sc-I Semester-II (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)

Course Code: CCS-204.3
Title of Course: Application Security Analyst

Syllabus to be implemented from Academic Year 2022-23

Course outcomes:

- 1) Understand application development life cycle
- 2) Identify vulnerabilities, entry points, error code etc.
- 3) Get acquainted with password cracking techniques and prevention techniques.
- 4) Understand authentication and authorization vulnerabilities.
- 5) Demonstrate use of SQL injection.
- 6) Investigate Session & browser manipulations

Unit-I

(15hrs)

Introduction: standard Systems Development Lifecycle (SDLC) practices and process, enterprise information technology (IT) architecture, key vulnerabilities to applications, Risk management frameworks and processes, Site Mapping & Web Crawling, Server & Application Fingerprinting, Identifying the entry points, File extensions handling, Page enumeration and brute forcing, **Comments in code** – view source, Looking for leftovers and backup files, Admin interfaces, Robots.txt, Analysis of error code

Unit-II

(15hrs)

Basic security concepts: hardware and software vulnerabilities

Malware: Types of Malware, Virus, Trojan, Key logger, File Binder, Testing FUD and Countermeasure.

Password Cracking and Prevention: Introduction, Password Cracking Techniques, Dictionary Based Attack, Brute force Attack, Cracking common files password, Cracking web based password, Password reset flaws, Password change flaws, Cracking Wifi password, Countermeasures for users, Countermeasures for System Administrators.

Unit-III

(15hrs)

Authentication & Authorization vulnerabilities: Authentication concepts, scenarios, User enumeration, Direct page requests, Parameter modification, Lack of SSL at login pages, Bypassing weak CAPTCHA mechanisms, Login without SSL, Authorization: RBAC, Authorization bypassing, Parameter tampering, Forceful browsing, Rendering based Authorization, Client side validation attacks, Insecure direct object reference.

File handling: Insecure file handling, Path traversal, Canonicalization, Uploaded files backdoors, Insecure file extension handling, Directory listing, File size, File type, Malware upload

Unit-IV

(15hrs)

Input vulnerabilities: SQL injection, Common implementation mistakes - authentication bypassing using SQL Injection, Cross Site Scripting, Reflected VS. Stored XSS

Command injection, Special chars - '& < >', empty

Session & browser manipulation: Session & browser manipulation attacks, Session management techniques, Cookie based session management, cookie properties, Cookies - secrets in cookies, tampering, Exposed session variables, Missing Attributes – httpOnly, secure Session validity after logoff, Long session timeout, Session keep alive – enable/disable, Session id rotation, Cross Site Request Forgery (CSRF), Open redirect, **IT Auditing**–Definition, Objectives and strategies

References:

1. Bryan Sullivan and Vincent Liu, Web Application Security, A Beginner's Guide, Mc Graw Hill
2. Michael Cross, Developer's Guide to Web Application Security, Syngress Publishers
3. Justin Clarke , SQL Injection Attacks and Defense, Elsevier
4. Nigel Chapman, Authentication and Authorization on the Web, Publisher Macavon Media, 2012
5. <https://owasp.org/>

M.Sc-I Semester-II (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
Course Code: CCS-204.4
Title of Course: Cloud Computing

Syllabus to be implemented from Academic Year 2022-23

Course outcomes:

- 1) Introduce the broad perceptive of cloud architecture and model
- 2) Apply different cloud programming model as per need.
- 3) Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications
- 4) To learn how to use Cloud Services.
- 5) To implement Task Scheduling algorithms.
- 6) To build Private Cloud.

Unit – I: (15hrs)

Fundamentals of Cloud Computing: Overview of Cloud Computing, Evolution of Cloud Computing, Types of Clouds, Key Characteristics of Cloud Computing, Intranets and Clouds. Benefits and challenges of cloud computing, Usage scenarios and Applications, Regulatory issues, major players in cloud computing.

Unit – II (15hrs)

Cloud Models & Services : Cloud Models – Benefits of Cloud Models, Public, Private, Hybrid, and Community Clouds, Types of Clouds Services: SaaS, PaaS, IaaS, DaaS, MaaS, CaaS. Service Providers: Google, App Engine, Microsoft Azure, Amazon EC2, IBM, Salesforce; Introduction to MapReduce, GFS, HDFS, Hadoop Framework.

Unit – III (15hrs)

Essentials & Collaborating with Cloud: Hardware and Infrastructure – Clients, Security, Network, Services; Accessing Cloud – Platforms, Web Applications, Web APIs, Web Browsers; Cloud Storage – Overview, Cloud Storage Providers; Standards – Application, Client, Infrastructure, Service; Centralizing Email Communications, Collaborating on Calendars, Schedules & Task Management, Event Management, Project Management and Contact Management.

Unit-IV (15hrs)

Virtualization & Security for Clouds: Need for Virtualization – Pros and Cons of Virtualization, Types of Virtualization, System VM, Process VM, Virtual Machine Monitor – Virtual Machine Properties, HLL VM, Hypervisor –VMWare, Virtual Box, Hyper-V; Case Studies on Cloud Data Centres. Security in Clouds – Cloud security challenges, SaaS as Service Security; Common Standards – Open Cloud Consortium, Distributed Management Task Force, Standards for Application Developers; Standards for Messaging – Standards for Security, End User access to cloud computing, mobile internet devices and the cloud.

Reference Books:

1. Bloor R., Kanfman M., Halper F. Judith Hurwitz “Cloud Computing for Dummies” (Wiley India Edition) 2010, ISBN 978-0-470-48470-8.
2. Barrie Sosinsky, “Cloud Computing Bible, “ Wiley India Pvt. Ltd. 2012
3. George Reese, “Cloud Application Architectures”, Shroff/O’ Reilly, 2009.

4. John W. Rittinghouse & James F. Ransome, “Cloud Computing: Implementation, Management and Security”, CRC Press, 1st Edition, 2009, ISBN 978-1439806807.
5. Antohy T Velte, Toby J. Velte, Robert Elsenpeter, Cloud Computing: “A Practical Approach”, McGraw Hill, 2009. ISBN 978-0-07-068351-8
6. Michael Miller, Cloud Computing: “Web-Based Applications That Change the Way You Work and Collaborate Online”, Que Publishing, August 2008. ISBN 978-0-7897-3803-5
7. George Reese, “Cloud Application Architecture”, O’Reilly and Associates.

M.Sc-I Semester-II (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)

Course Code: CCPR-205

Title of Course: Web Technology Lab and Advanced Java Lab

Syllabus to be implemented from Academic Year 2022-23

Course outcomes:

- 1) Debug and deploy ASP.NET web applications
- 2) Discuss the insights of internet programming and implement complete application over the web
- 3) Use the features of Dot Net Framework along with the features of C#
- 4) Build and host web applications using ASP.NET
- 5) Develop and deploy Windows applications
- 6) Handle data by using ADO.NET architecture
- 7) Create database-driven ASP.NET web applications and web services
- 8) Handle various toolkit like AJAX
- 9) Utilize the concepts of JavaScript
- 10) Develop and deploy a website using HTML
- 11) Define & explain applet Life cycle
- 12) Differentiate local and remote applet
- 13) Write the code for a simple Java applet
- 14) Explain applet tag and its parameter
- 15) Use the methods of the Applet and Component classes required for a basic applet
- 16) Describe the classes in the AWT package that relate to the Applet class
- 17) Describe the AWT graphics explain controls and how to apply them in the container
- 18) Develop simple programs using Event class and Event Listener Interface
- 19) Develop a program for steps to connect a database
- 20) Describe the Basics of JDBC
- 21) Explain the different Types of JDBC drivers & their advantages and Disadvantages
- 22) Develop program to use JDBC to query a database and modify
- 23) Describe life cycle of servlet
- 24) Develop program using javax.servlet package
- 25) Explain JSP Architecture and its Life cycle
- 26) Develop simple program

M.Sc-I Semester-II (Computer Science)

Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)

Course Code: CCPR-206

Title of Course: Project

Syllabus to be implemented from Academic Year 2022-23

Course outcomes:

- 6) Gain skills as they apply knowledge effectively in diverse contexts.
- 7) Analyse and model requirements and constraints for the purpose of designing and implementing software artefacts and IT systems
- 8) Design and implement software solutions that accommodate specified requirements and

- constraints, based on analysis or modelling or requirements specification
- 9) Present a clear, coherent and independent exposition of software applications, alternative IT solutions, and decision recommendations to both IT and non-IT personnel via technical reports of professional standard and technical presentations.
 - 10) Team work: Work effectively in different roles, to form, manage, and successfully produce outcomes from teams, whose members may have diverse cultural backgrounds and life circumstances, and differing levels of technical expertise.

A software module development should be carried out as part of Project work.

M.Sc-I Semester-II (Computer Science)
Choice Based Credit System with Multiple Entry and Multiple Exit Option
(NEP-2020)
Course Code: SEC-207
Title of Course:

Syllabus to be implemented from Academic Year 2022-23

“Dissemination of Education for Knowledge, Science and Culture”

-Shikshanmaharshi Dr. Bapuji Salunkhe.

**Shri Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE (EMPOWERED
AUTONOMOUS), KOLHAPUR**



DEPARTMENT OF MICROBIOLOGY

B .Sc. Part-III

Semester - V & VI

SYLLABUS

SYLLABUS TO BE IMPLEMENTED FROM AUGUST 2023

STRUCTURE OF COURSE

Sr. No	Course code	Title of the course	Theory	Internal	Total Marks
Semester V					
1	DSE-1010E1	Immunology	35	15	50
2	DSE-1010E2	Medical Microbiology	35	15	50
3	DSE-1010E3	Industrial Microbiology	35	15	50
4	DSE-1010E4	Microbial Biochemistry	35	15	50
3	Practical I	Immunology and Medical Microbiology	-	-	50
	Practical II	Food and Industrial Microbiology			50
4	SEC-SE	Management of Human Microbial Diseases	-	-	50
5	AECC-E	English			50
Semester VI					
5	DSE-1010F1	Virology	35	15	50
	DSE-1010F2	Microbial Genetics	35	15	50
6	DSE-1010F3	Agricultural Microbiology	35	15	50
	DSE-1010F4	Environmental Microbiology	35	15	50
7	Practical III	Virology and Microbial Genetics			50
	Practical -IV	Agriculture and Environmental Microbiology			50
8	SEC-SF	Food Fermentation Techniques			50
9	AECC-F	English			50

- Theory and Practical Lectures : 48 Min. Each
- Total Credits for B.Sc.-III (Semester V & VI): 44

- Total Marks for B.Sc.-III (Including AECC (E & F): English and SEC-S) : 800
- Total Marks for B.Sc.-III (Excluding AECC (E & F)) : 700

- DSE- Discipline Specific Elective. AECC- Ability Enhancement Compulsory Course (E & F) : English
- SEC-S - Skill Enhancement Course for Science,
- SEC-S Examination will be conducted annually (E & F Combine) for 100 marks, passing for SEC shall be 40% Practical Examination will be conducted annually for 200 Marks per course (subject).
- There shall *Separate passing is mandatory for Theory, Internal and Practical*

SEMESTER -V

Paper IX DSE:1010E1	IMMUNOLOGY Theory: 30 Hours (Credits -2)	No. of Hours per unit/ credit
<p>Course Outcomes - Upon successful completion of course, students are expected to be able to -</p> <p>CO1: Understand the overall organization of the Immune system.</p> <p>CO2: Explain the salient features of antigen antibody reaction & its use in diagnostics and in various other studies.</p> <p>CO3: Understand various viral, bacterial & fungal diseases, their causative agent, mode of infection, epidemiology lab diagnosis, treatment and prophylaxis.</p> <p>CO4: Explain different antimicrobial agents with respect to their mode of action uses</p>		
UNIT I	<p>1.Cells of Immune system -</p> <p style="padding-left: 20px;">a. Hematopoiesis- characteristics & types of stem cells.</p> <p style="padding-left: 20px;">b. Classification of cells of immune system - lymphoid & myeloid cells.</p> <p style="padding-left: 20px;">c. Structure & function of lymphoid cells - T cell & T cell subsets, NK cells, B cells & dendritic cells.</p> <p style="padding-left: 20px;">d. Structure & function of myeloid cells- Granulocytes, monocytes & macrophages.</p> <p>2. Membrane receptors for antigen and their role in antigen recognition</p> <p style="padding-left: 20px;">a. B cell surface receptor for antigen (BCR)</p> <p style="padding-left: 20px;">b. T cell surface receptor for antigen (TCR)</p> <p style="padding-left: 20px;">c. NK receptors</p> <p>3. Molecular mechanism of antibody production.</p> <p style="padding-left: 20px;">a. Processing and presentation of antigen by Antigen presenting cell.</p> <p style="padding-left: 20px;">b. Interaction of APC with T_H Cell.</p> <p style="padding-left: 20px;">c. Interaction of B cell and T_H Cell</p> <p style="padding-left: 20px;">d. Clonal proliferation and differentiation of activated B cell.</p> <p style="padding-left: 20px;">e. Role of follicular dendritic cells in selection of high affinity B cell.</p>	15

	<p>f. Role of cytokines in proliferation and differentiation.</p> <p>4. Cytokines -</p> <p>a. Properties, types and function of cytokines produced by TH cell and Macrophages</p> <p>5. Interferon -</p> <p>a. Nature and types of Interferons</p> <p>b. Induction of Interferon</p> <p>c. Mechanism of action.</p> <p>6. Immunological tolerance:</p> <p>a. Tolerance induction in adults and neonates by drug and monoclonal antibody</p> <p>b. Cellular mechanism of immunological tolerance.</p> <p>c. Termination of tolerance.</p>	
<p>UNIT II</p>	<p>1. Complement -</p> <p>a. Nature and Properties of Complement</p> <p>b. Complement activation by classical and alternate pathway.</p> <p>c. Biological consequences of complement activation</p> <p>2. Monoclonal antibodies -</p> <p>a. Basic concepts - Mouse, Human and Humanized antibodies.</p> <p>b. Production of monoclonal antibodies by hybridoma technology.</p> <p>c. Production of Humanized Monoclonal antibodies by recombinant DNA technology.</p> <p>d. Applications of monoclonal antibodies in diagnosis, treatment and research.</p> <p>3. New diagnostic techniques: -</p> <p>a. RIA</p> <p>b. Dot Blot Technique</p> <p>4. Hypersensitivity -</p> <p>a. Basic concept, Gell and Coombs classification</p> <p>b. Type I - Anaphylaxis</p> <p>c. Type II - Blood transfusion reactions</p> <p>d. Type III - Serum sickness</p> <p>e. Type IV - Delayed type hypersensitivity - Allograft rejection.</p>	<p>15</p>

5. Autoimmune disease:

a Types of autoimmune diseases.

i) Organ specific –ex. Hashimoto's thyroiditis, Good Pasture syndrome, Graves' disease, Insulin dependent diabetes, Myasthenia gravis, Addison's disease

ii) Systemic autoimmune diseases- ex. Systemic Lupus erythematosus & MS

b Treatment of autoimmune diseases.

Reference Books:

A. For Immunology

- 1) Immunology - 6th edition - Kubay, Kindt, Goldsby & Osborne.
- 2) Essential Immunology - 11th edition - Delves, Martin, Burton and Roitt.
- 3) Immunology - An Introduction, 4th edition – Tizzard.
- 4) Basic and Clinical Immunology 5th edition- Stites, Stobo, H. H. Fudenberg.
- 5) Essentials of Immunology - S. K. Gupta
- 6) Immunology - M. P. Arora

Paper X DSE:1010E2	MEDICAL MICROBIOLOGY Theory: 30 Hours (Credits -2)	No. of Hours per unit/ credit
<p>Course Outcomes - Upon successful completion of course, students are expected to be able to -</p> <p>CO1: Correlate disease symptoms with causative agent, isolate and identify pathogens.</p> <p>CO2: Understand mechanism of action of antimicrobial drugs and their uses as prophylactic agents.</p> <p>CO3: Explain pathogenicity of organisms associated with human infections.</p> <p>CO4: Explain different antimicrobial agents with respect to their mode of action uses.</p>		
UNIT I	<p>1. Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by -</p> <p style="padding-left: 40px;">a. <i>Mycobacterium leprae</i></p> <p style="padding-left: 40px;">b. <i>Clostridium perfringens</i>,</p> <p style="padding-left: 40px;">c. <i>Treponema pallidum</i></p> <p>2. Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by -</p> <p style="padding-left: 40px;">a. <i>Pseudomonas aeruginosa</i></p> <p style="padding-left: 40px;">b. <i>Vibrio cholera</i></p> <p style="padding-left: 40px;">c. <i>Leptospira interrogans</i></p> <p style="padding-left: 40px;">d. <i>Helicobacter pylori</i></p>	15
UNIT II	<p>1. Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by -</p> <p style="padding-left: 40px;">a. Protozoa: <i>Plasmodium falciparum</i> (malaria)</p> <p style="padding-left: 40px;">b. Viruses: i) Hepatitis A & B virus</p> <p style="padding-left: 80px;">ii) Rabies virus</p> <p style="padding-left: 80px;">iii) Dengue virus</p> <p style="padding-left: 40px;">c. Fungi: <i>Candida albicans</i></p>	15

2. Chemotherapy

a. General principles of chemotherapy

b. Mode of action of Penicillin, Streptomycin, Bacitracin, ,
sulphonamide and Quinolones on microorganisms.

c. Antiviral drug: AZT

d. Antifungal drugs: Ketoconazole

e. Antiprotozoal drugs: Metronidazole

f. Mechanism of drug resistance

g. Chemoprophylaxis

3. Gene therapy – Concept, advantages & disadvantages.

4. Immunoprophylaxis – Vaccines and Immune Sera

a. Vaccines - live attenuated, heat killed, subunit, conjugate and
DNA vaccines

b. Immune Sera – examples with applications

B. Reference Books:

1) Microbiology - Davis

2) Immunology & serology - Ashim Chakravarty

3) Medical Microbiology 16th edition by David Greenwood, Richard C B Slack, John
Peutherer

4) Medical Bacteriology - Dey & Dey

5) Medical Bacteriology including Medical Mycology & AIDS - NC Dey & T. K. Dey

6) Principals and Practice of Clinical Bacteriology – A.M. Emmerson

Paper XI DSE: 1010 E 3	INDUSTRIAL MICROBIOLOGY Theory: 30 Hours (Credits -2)	No. of Hours per unit/ credit
<p>Course Outcomes - On completion of course, students will be able to –</p> <p>CO1: Know methods used for industrial production of various products using microorganisms.</p> <p>CO2: Explain various techniques for product recovery after fermentation.</p> <p>CO3: Understand the cause of spoilage of food and methods for preservation of food.</p> <p>CO4: Explain various methods of preservation of industrially important microorganism.</p>		
UNIT I	<p>1. Food Microbiology</p> <p>a. Food as a substrate for microorganisms.</p> <p>b. Food borne diseases – i. Role of microorganisms in food borne diseases</p> <p style="padding-left: 100px;">ii. Food poisoning - i) Staphylococcal ii) Fungal (aflatoxin)</p> <p>iii. Food infections –Salmonellosis.</p> <p>iv. Food spoilage and its preservation</p> <p>2. Industrial Microbiology</p> <p>a. Strain Improvement</p> <p>b. Scale up of fermentations</p> <p>c. Microbiological assays</p> <p>d. Preservation of industrially important microorganisms - Methods, Culture collection centers</p>	15
UNIT - II	<p>1. Industrial production of -</p> <p>a. Amylase - Organisms used, Inoculum preparation, Fermentation media, Fermentation conditions, Extraction and Recovery.</p> <p>b. Grape wine - Definition, types, production of table wine (Red and White), microbial defects of wine</p> <p>c. Penicillin - Organisms used, Inoculum preparation, Fermentation media, Fermentation conditions, Extraction and Recovery. Concept of semi synthetic penicillin</p>	15

	<p>d. Citric acid - Organisms used, Inoculum preparation,</p> <p>e. Fermentation media, Fermentation conditions, Extraction and Recovery.</p> <p>f. SCP by using yeast</p> <p>2. Microbial Production of -</p> <p>a. Vitamins - Vit. B₁₂</p> <p>b. Amino acids - Lysine</p> <p>3. Probiotics- Concept, Production by using <i>Lactobacillus</i> and applications</p> <p>4. Downstream processing & product recovery-</p> <p>a. Centrifugation</p> <p>b. Flocculation</p> <p>c. Filtration</p> <p>d. Solvent extraction</p> <p>e. Distillation</p> <p>f. Precipitation</p> <p>g. Crystallization</p> <p>h. Chromatography.</p> <p>5. Testing of sterility, pyrogen, carcinogenicity, toxicity and allergens</p>	
--	---	--

Reference Books:

A. For Food microbiology and industrial microbiology

1. Principles of fermentation technology- Peter F. Stanbury & Allan Whitaker (Pergamon Press).
2. Principles of Microbial technology - Pepler, Vol. I & II.
3. Industrial Microbiology - Casida
4. Industrial Microbiology - A. H. Patel
5. Industrial Microbiology - Prescott & Dunn
6. Industrial Microbiology - Miller
7. Pharmaceutical Microbiology - Huggo & Russel
8. Food Microbiology - Frazier

Paper XII DSE: 1010 E 4	MICROBIAL BIOCHEMISTRY Theory: 30 Hours (Credits -2)	No. of Hours per unit/ credit
<p>Course Outcomes - Upon successful completion of course, students are expected to be able to -</p> <p>CO1: Explain Metabolic pathways and Bioenergetics</p> <p>CO2: Understand Various downstream processing</p> <p>CO3: Understand Basic concept related to enzyme</p> <p>CO4: Determine enzyme production and its activity</p>		
UNIT I	<p>1. Enzymes -</p> <p>a. Definition, properties, structure, specificity, classification and mechanism of action (Lock & Key, Induced fit hypothesis)</p> <p>b. Allosteric enzymes - Definition, properties, models explaining mechanism of action.</p> <p>c. Ribozymes -concept, significance.</p> <p>d. Isozymes- definition, properties, example.</p> <p>e. Factors affecting catalytic efficiency of enzymes</p> <p style="padding-left: 40px;">i. Proximity and orientation</p> <p style="padding-left: 40px;">ii. Strain and distortion.</p> <p style="padding-left: 40px;">iii. Acid base catalysis</p> <p style="padding-left: 40px;">iv. Covalent catalysis</p> <p>f. Enzyme kinetics - Derivation of Michaelis-Menten equation, Lineweaver Burk Plot, Significance of K_m and V_{max}.</p> <p>g. Regulation of enzyme synthesis.</p> <p style="padding-left: 40px;">i. Positive control -Ara operon</p> <p style="padding-left: 40px;">ii. Negative control -Lac operon</p> <p style="padding-left: 40px;">iii. Catabolite repression</p> <p>2. Extraction & purification of enzymes.</p> <p>a. Methods of extraction of intracellular and extracellular enzymes.</p>	15

	<p>i. Choice of source and biomass development</p> <p>ii. Methods of homogenization - cell disruption methods</p> <p>iii. Purification of enzymes on the basis of -</p> <ul style="list-style-type: none"> • Molecular size • Solubility differences • Electrical charge • Adsorption characteristic differences <p>3. Assay of enzymes - Based on substrate and product estimation.</p> <p>4. Immobilization of enzymes - Methods & applications</p> <p>5. Confirmation of purified enzymes</p>	
UNIT II	<p>1. Basic concepts of -</p> <p>a. Glyoxylate bypass</p> <p>b. Phosphoketolase pathway</p> <p>c. Bioluminescence – Occurrence, mechanism & applications.</p> <p>2. Assimilation of -</p> <p>a. Carbon</p> <p>b. Nitrogen with respect to N₂ and NH₃ (GOGAT)</p> <p>c. Sulphur</p> <p>3. Prokaryotic Biosynthesis of -</p> <p>a. RNA</p> <p>b. DNA</p> <p>c. Proteins</p> <p>d. Peptidoglycan</p>	15

Reference Books:

B. For Microbial Biochemistry

1. Enzymology - Prise & Stevens
2. Enzymes - Biochemistry, Biotechnology, clinical chemistry - Trevor Palmer.
3. Enzymes - Dixon and Webb
4. Lehnigers Principles of Biochemistry by David Nelson & Michale Cox, Fifth edition.
5. General Microbiology - Stanier
6. Principles & techniques of Biochemistry - Wilson & Walker, 6th edition.
7. Biochemistry - Lubert Stryer

SEC-SE	Management of Human Microbial Diseases Theory :30 Hours (Credits -2)	No. of Hours per unit/ credit
Course Outcomes: Upon successful completion of the course, students are expected to be able to - CO1: Explain the causes of immune deficiency diseases. CO2: Understand the cause and transmission of diseases. CO3: Design the diagnostic test and therapeutic agents. CO4: Apply their knowledge to prevent diseases.		
UNIT I	a. Human Diseases Infectious and non infectious diseases, microbial and non microbial diseases, Deficiency diseases, occupational diseases, Incubation period, mortality rate, nosocomial infections b. Microbial diseases Respiratory microbial diseases, gastrointestinal microbial diseases, Nervous system diseases, skin diseases, eye diseases, urinary tract diseases, Sexually transmitted diseases: Types, route of infection, clinical systems and general prevention methods, study of recent outbreaks of human diseases (SARS/ Swine flu/Ebola) – causes, spread and control, Mosquito borne disease – Types and prevention.	15
UNIT II	a. Therapeutics of Microbial diseases Judicious use of antibiotics, importance of completing antibiotic regimen, Concept of DOTS, emergence of antibiotic resistance, current issues of MDR/XDR microbial strains. Treatment using antiviral agents: Amantadine, Acyclovir, Azidothymidine. Concept of HAART. b. Prevention of Microbial Diseases General preventive measures, Importance of personal	15

	hygiene, environmental sanitation and methods to prevent the spread of infectious agents transmitted by direct contact, food, water and insect vectors.	
	Reference Books - 1. Ananthanarayan R. and Paniker C.K.J. (2009) Textbook of Microbiology. 8th edition, University Press Publication 2. Willey JM, Sherwood LM, and Woolverton CJ. (2013) Prescott, Harley and Klein's Microbiology. 9th edition. McGraw Hill Higher Edu.	

SEMESTER VI

PAPER VII DSE:1010F1	VIROLOGY Theory: 30 Hours (Credits -2)	No. of Hours per unit/ credits
<p>Course Outcomes - Upon successful completion of course, students will be able to -</p> <p>CO1: Describe various stages involved in multiplication cycle of viruses</p> <p>CO2: Understand methodological approaches in isolation, cultivation & purification of viruses.</p> <p>CO3: Distinguish characteristics of normal cell and cancerous cell.</p> <p>CO4: Explain various methods for enumeration of viruses.</p>		
UNIT - I	<p>1. a. The Structural properties of viruses: Capsids, Nucleic acids and envelope.</p> <p style="padding-left: 20px;">b. Structure of T4 bacteriophage, TMV and HIV, Viroids & prions.</p> <p style="padding-left: 20px;">c. One step growth experiment.</p> <p>2. Isolation, cultivation and Purification of viruses</p> <p style="padding-left: 20px;">a. Isolation and cultivation of viruses -</p> <p style="padding-left: 40px;">i. Animal virus - Tissue culture, chick embryo and live animals.</p> <p style="padding-left: 40px;">ii. Plant virus - Protoplasts culture technique, Insect tissue culture</p> <p style="padding-left: 40px;">iii. Bacteriophages - Plaque method.</p> <p style="padding-left: 20px;">b. Purification of viruses using physico-chemical properties</p> <p style="padding-left: 40px;">i. Density gradient centrifugation</p> <p style="padding-left: 40px;">ii. Precipitation</p> <p>3. Methods of Enumeration of viruses</p> <p style="padding-left: 40px;">i. Latex droplet method (Direct microscopic count)</p> <p style="padding-left: 40px;">ii. Plaque and pock method.</p>	15
UNIT - II	1. a) Lysogeny - Definition of lysogeny and temperate phage,	

types, lysogeny by lambda phage - adsorption & penetration, genetic map for lysogenic interaction, expression of λ genes, establishment of repression, maintenance of repression, integration of λ genome in host chromosome.

b. Reproduction of animal viruses - Adenovirus.

c. Reproduction of plant viruses - TMV

d. Reproduction of T4 phage.

2. Oncogenesis:

a. Definition of oncogenesis

b. Types of cancer

c. Characteristics of cancer cells.

d. Tumor suppressor genes and protooncogenes

e. Hypothesis about cancer.

I. Somatic mutation hypothesis

II. Viral gene hypothesis

i. Role of DNA viruses with special emphasis on Papova viruses.

ii. Role of RNA tumor viruses

iii. Provirus theory, Protovirus theory, Oncogene theory.

III. Defective immunity hypothesis.

Reference Books :

1. General Microbiology - Stanier

2. Microbiology - Prescott, Klein

3. Microbiology - Davis

4. General Virology - Luria

5. Genetics of Bacteria and their Viruses - William Hayes.

6. General Microbiology Vol. II - Powar and Dagainawala

7. Virology - Biswas and Biswas

PAPER VII DSE:1010F1	MICROBIAL GENETICS Theory: 30 Hours (Credits -2)	No. of Hours per unit/ credits
<p>Course Outcomes - Upon successful completion of course, students will be able to -</p> <p>CO1: Understand molecular mechanism involved in gene regulation</p> <p>CO2: Understand the basic concept of operon and mutation.</p> <p>CO3: Discuss the principle, working and applications of molecular biology techniques including PCR and DNA sequencing.</p> <p>CO4: Explain techniques used to manipulate genes & formation of clones</p>		
UNIT-I	<ol style="list-style-type: none"> 1. One cistron - one polypeptide hypothesis. 2. Molecular mechanism of gene expression <ol style="list-style-type: none"> a. Concept of operon b. Pribnow box c. Genetic regulation in tryptophan operon 3. Mutations <ol style="list-style-type: none"> a. Expression of mutations - <ol style="list-style-type: none"> i. Time course of phenotypic expression. ii. Conditional expression of mutation. b. Suppressor mutations (with examples) - Genetic and non-genetic. 4. Methods of isolation and detection of mutants based on - <ol style="list-style-type: none"> a. Relative survival b. Relative growth c. Visual detection 	15
UNIT - II	<ol style="list-style-type: none"> 1.Genetic complementation - Cis-trans test 2.Extrachromosomal inheritance: <ol style="list-style-type: none"> a. Kappa particles. b. Transposable elements - general properties and types. 3.Techniques in Molecular Biology - <ol style="list-style-type: none"> a. DNA sequencing (Sanger's method) b. DNA Finger printing c. PCR 	15

d. Blotting techniques- Southern, Western, Northern

4. Genetic engineering

- a. Introduction
- b. Tools of genetic engineering -
 - i. Enzymes
 - ii. Vectors-phage, plasmid and cosmid
 - iii. DNA probe - methods of preparation and detection.
 - iv. Linkers and adaptors
 - v. Cloning organisms - (Bacteria and Yeasts)
 - vi. Genomic library and cDNA library
- c. Techniques -
 - i. Isolation of desired DNA segment- Shotgun Method, cDNA synthesis, Chemical synthesis
 - ii. Construction of r-DNA using appropriate vector- Use of restriction enzymes, Linkers, Adaptors Homopolymer tails
 - iii. Transfer to cloning organisms (Bacteria and Yeasts)
 - iv. Selection of recombinant bacteria and yeasts - Blue and white screening, Colony hybridization technique.
- d. Application of genetic engineering in -
 - i. Medicine-
 - ii. Agriculture
 - iii. Industry
 - iv. Environment
 - v. Understanding biology

Reference Books :

- 1.Genetics - Stickberger.
2. Genes - Benjamin Lewin IX ed.
- 3.Principles of gene manipulation - Primrose and Old
- 4.Genetic Engineering - Second Ed. Desmond S. T. Nicholl
- 5.Recombinant DNA - J. D. Watson
- 6.Biochemistry - Lehninger
- 7.Molecular Biology of Gene - J. D. Watson

PAPER VIII DSE:1010F2	AGRICULTURAL MICROBIOLOGY Theory: 30 Hours (Credits -2)	No. of Hours per unit/ credit
--	--	--

Course Outcomes - Upon successful completion of course, students will be able to –

CO1: Understand various plant microbe interactions especially rhizosphere and their applications especially the biofertilizers and their production techniques

CO2: Understand various biogeochemical cycles - C, N,P cycle and microbes involved

CO3: Perform isolation of agriculturally important microorganisms and formulate biofertilizers.

CO4: Explain role of microorganisms and common symptoms of plant diseases.

UNIT -I	<p>1. Soil Microbiology.</p> <ul style="list-style-type: none"> a. Physical characters. b. Chemical characters. c. Types of microorganisms in soil and their role in soil fertility. d. Microbiological interactions - Symbiosis, Commensalism, Amensalism, Parasitism, Predation. <p>2. Role of microorganisms in elemental cycle</p> <ul style="list-style-type: none"> e. Carbon cycle. f. Nitrogen cycle g. Phosphorous cycle h. Sulfur cycle <p>3. Manure and Compost</p> <ul style="list-style-type: none"> a. Methods of Production - <ul style="list-style-type: none"> i. Green manure and farm yard manure ii. City compost- Windrow and pit method. iii Vermicompo c. Optimal conditions for composting with reference to - Composition of organic waste, Availability of microorganisms, Aeration, C:N:P ratio, Moisture content, Temperature, pH, Time. 	15
----------------	---	-----------

<p>UNIT - II</p>	<p>1. Types, production, methods of application and uses of -</p> <p>a. Biofertilizers</p> <p>i. Nitrogen fixing - Azotobacter, Rhizobium, Azospirillum.</p> <p>ii. Phosphate Solubilizing Microorganisms.</p> <p>b. Biopesticides</p> <p>i. <i>Bacillus thuringiensis</i></p> <p>ii. <i>Trichoderma spp.</i></p> <p>2. Biodegradation by bacteria & fungi-</p> <p>a. Cellulose</p> <p>b. Pesticides</p> <p>3. Plant Pathology</p> <p>a. Common symptoms produced by plant pathogens</p> <p>b. Modes of transmission of plant diseases.</p> <p>c. Plant diseases-</p> <p>i. Citrus Canker</p> <p>ii. Tikka disease of groundnut</p> <p>iii. Bacterial Blight of Pomegranate.</p> <p>iv. Control of plant disease caused by bacteria.</p>	<p>15</p>
-------------------------	---	-----------

Reference Books:

1. Soil Microbiology - An exploratory approach - Mark Coyne.
2. Agricultural Microbiology - N. Mukherjee and J. Ghosh.
3. Introduction to Soil Microbiology - Martin Alexander IInd Edition.
4. Agricultural Microbiology - Rangaswamy and Bhagyaraj IInd Edition
5. Plant diseases - R. S. Singh.
6. Diseases of crop plants in India - G. Rangaswamy.
7. Soils and Soils Fertility - 6th edition - Frederick R. Troeh
(Blackwell publishing Co.)
8. Soil Microbiology - Singh, Purohit, Parihar. (Agrobios India, 2010)
9. Soil Microbiology and Biochemistry – Ghulam Hassan Dar (New India Publishing Agency, 2010)

PAPER VIII DSE:1010F2	ENVIRONMENTAL MICROBIOLOGY Theory: 30 Hours (Credits -2)	No. of Hours per unit/ credit
--	---	--

Course Outcomes - Upon successful completion of course, students will be able to -

CO1: Understand the basic principle of environment microbiology and be able to apply these principles to understanding and solving environmental problems.

CO2: Know the Microorganisms responsible for water pollution and their transmission

CO3: Describe classification of lakes, sources, consequences and control of eutrophication.

CO4: Explain various bioburden tet and clean room concepts.

UNIT - I	<p>1.General characteristics of waste-</p> <ul style="list-style-type: none"> a.Liquid waste - pH, electrical conductivity, COD, BOD, total solids, total dissolved solids, total suspended solids, total volatile solids, chlorides, sulphates, oil & grease. b. Solid waste- pH, electrical conductivity, total volatile solids, ash. c. Standards as per MPCB <p>2.Sewage Microbiology</p> <ul style="list-style-type: none"> a. Physico-chemical and Biological characteristics b. Treatment methods- <ul style="list-style-type: none"> i. Physical treatment: Screening, Sedimentation ii. Biological treatment: Trickling filter, Activated sludge process, Oxidation ponds, Anaerobic digestion (Biomethanation), Septic tank. iii. Chemical treatment - Chlorination <p>3.Characteristics of waste generated by</p> <ul style="list-style-type: none"> a. Sugar Industry b. Dairy Industry <p>4.Characteristics and treatment of waste generated by Hospitals</p> <p>5.Eutrophication</p> <ul style="list-style-type: none"> a. Classification of lakes b. Sources c. Consequences 	
-----------------	---	--

	d. Control	
<u>UNIT - II</u>	<p>1. Biological safety in laboratory</p> <p>a. Good Laboratory Practices</p> <p>b. Bio safety levels (BSL)</p> <p>2. Environmental monitoring</p> <p>a. Definition and purpose</p> <p>b. Cleanroom- Concept, classification, prevention of contamination in clean rooms</p> <p>c. Routine Environmental monitoring programme in pharmaceutical industries- Air monitoring, Surface monitoring and Personnel monitoring.</p> <p>d. Bioburden test</p> <p>3. Environmental Impact Assessment- Concept and brief introduction</p> <p>4. Bioremediation and Bioleaching</p> <p>a. Bioremediation</p> <p>i. Definition</p> <p>ii. Types</p> <p>iii. Applications.</p> <p>b. Bioleaching</p> <p>i. Introduction</p> <p>ii. Microorganisms involved</p> <p>iii. Chemistry of Microbial leaching</p> <p>iv. Laboratory scale and pilot scale leaching</p> <p>v. In situ leaching - Slope, heap</p> <p>vi. Leaching of Copper and Uranium</p>	15

Reference Books:

1. Environmental Pollution by Chemicals - Walker, Hulchison.
2. Biochemistry and Microbiology of Pollution - Higgins and Burns.
3. Environmental Pollution - Laurent Hodge, Holt.
4. Waste Water Treatment - Datta and Rao (Oxford and IBH)
5. Sewage and waste treatment – Hammer

6. Environment Chemical Hazards - Ram Kumar (Swarup and Sons, New Delhi).
7. Environment Pollution - Timmy Katyal (Satke Anmol Pub. New Delhi).
8. Ecology of Polluted Water - Vol. II - Anand Kumar (Aph Pub. Co. New Delhi).
9. Environment Pollution and Management of waste waters by
Microbial Techniques - Pathade and Goel (ABD Pub. Jaipur).
10. Current Topics in Environmental Sciences - Tripathi and Pandey (ABD Pub. Jaipur).
11. Environmental Impact Assessment - R. K. Trivedy
Microbial Limit and Bioburden Tests, 2nd edition - Lucia Clontz (CRCpress

SEC-SF	FOOD FERMENTATION TECHNIQUES Theory :30 Hours (Credits -2)	No. of Hours per unit/ credit
---------------	--	--------------------------------------

Course Outcomes - Upon successful completion of course, students are expected to be able to-

CO1: Understand the role of microorganisms in fermentation process

CO2: Start small scale food industry

CO3: Apply their knowledge in designing techniques for food processing

CO4: Explain the role and health benefits of microorganism in probiotic food.

UNIT I	<p>1. Fermented Foods Definition, types, advantages and health benefits</p> <p>2. Milk Based Fermented Foods Dahi, Yogurt, Buttermilk (Chach) and cheese: Preparation of inoculums, types of microorganisms and production process</p> <p>3. Grain Based Fermented Foods Soy sauce, Bread, Idli and Dosa: Microorganisms and production process</p>	15
UNIT II	<p>1. Vegetable Based Fermented Foods Pickels, Saeurkraut: Microorganisms and production process</p> <p>2. Fermented Meat and Fish Types, microorganisms involved, fermentation process</p> <p>3. Probiotic Foods Definition, types, microorganisms and health benefits</p>	15

Reference Books: -

- 1.Yadav JS, Grover, S and Batish VK (1993) A comprehensive dairy microbiology, Metropolitan
- 2.Jay JM, Loessner MJ, Golden DA (2005) Modern Food Microbiology, 7th edition. Springer
3. edition. Springer

**PRACTICAL
SEMESTER V**

PRACTICAL - I	IMMUNOLOGY AND MEDICAL MICROBIOLOGY (Credits -4)
	<p>Major:</p> <ol style="list-style-type: none"> 1. Isolation of following pathogens from clinical samples (wherever possible) and identification of the same by morphological, cultural and biochemical characteristics. <ol style="list-style-type: none"> a. <i>Pseudomonas aeruginosa</i> b. <i>Klebsiella pneumoniae</i> c. <i>Candida albicans</i> 2. Determination of MIC of streptomycin against <i>E.coli</i> by broth method <p>Minor:</p> <ol style="list-style-type: none"> 1. Determination of sensitivity of common pathogens to antibiotics by paper disc method. 2. Serological tests: <ol style="list-style-type: none"> a. Widal test - Quantitative b. Demonstration of Enzyme Linked Immunosorbent Assay (ELISA) 3. Haematology : <ol style="list-style-type: none"> a. Estimation of haemoglobin by Sahli's method. b. Determination of ESR of the blood sample (Westergren method) c. Determination of PCV d. Total and differential blood cells count. 4. Urine analysis <ol style="list-style-type: none"> a. Physical and chemical examination of urine. b. Test for protein (Acetic acid test) c. Test for ketone bodies (Rothra's test) d. Test for bile salt.

PRACTICAL II

**FOOD AND INDUSTRIAL MICROIOLOGY
(Credits -4)**

Major:

1. Assay of amylase by DNSA method (graphical estimation)
2. Bio-assay of Vitamin B12
3. Bio-assay of Penicillin.
4. Microbial testing of Water:
 - a. Presumptive, confirmed and completed test.
 - b. MPN
 - c. SPC of tomato sauce.
5. Production of wine and examination for pH, colour and alcohol content.

Minor:

1. Citric acid fermentation, recovery and estimation by titration.
2. Amylase production by using *Bacillus* species.
3. Isolation of lactic acid bacteria from fermented food.
4. Examination of milk by Direct microscopic count (DMC)
5. Sauerkraut production.

PRACTICAL III	<p style="text-align: center;">VIROLOGY AND MICROBIAL GENETICS (Credits -4)</p>
	<p>Major:</p> <ol style="list-style-type: none"> 1. Isolation of coliphages from sewage. 2. Effect of U.V. light on bacteria and graphical presentation of result. 3. Isolation of auxotrophic mutants by replica plate technique 4. Transfer of genetic material by transformation in <i>E. coli</i> 5. Isolation of chromosomal DNA from bacteria (J. Marmurs method) <p>Minor:</p> <ol style="list-style-type: none"> 1. Electrophoretic separation of DNA. 2. Isolation of streptomycin - resistant mutants (gradient plate technique) 3. Isolation of Lac negative mutants of <i>E. coli</i>
PRACTICAL IV	<p style="text-align: center;">AGRICULTURAL AND ENVIRONMENTAL MICROBIOLOGY (Credits -4)</p>
	<p>Major:</p> <ol style="list-style-type: none"> 1. Isolation of Azotobacter from soil. 2. Isolation of Xanthomonas from infected citrus fruit. 3. Isolation of Rhizobium from root nodules. 4. Isolation of phosphate solubilizing bacteria from soil. 5. Determination of BOD of sewage <p>Minor:</p> <ol style="list-style-type: none"> 1. Determination of texture, color, pH of soil. 2. Estimation of Calcium and Magnesium from soil (EDTA method) 3. Determination of organic carbon content of soil (Walkley and Black method) 4. Determination of COD of sewage.
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. Medical Lab Technology- Ramnikand Sood, Jaypee brothers (Medical pub. NewDelhi) 2. Practical Biochemistry -Plummer 3. APHA (American Public Health Association) Handbook 4. Soil, Plant and Water Analysis-P. C. Jaiswal 5. Biochemical methods-S. Sadasivam, A. Manickam 6. Practical Biochemistry-J. Jayraman 7. Practical Microbiology – R.C. Dubey, D. K. Maheshwari , S. Chand & Co. Ltd. 	

Practical Examination

A) The practical examination will be conducted on three (3) consecutive days for not less than 6 hours on each day of the practical examination.

B) Each candidate must produce a certificate from the Head of the Department in his/her college stating that he/she has completed in a satisfactory manner the practical course on the guidelines laid down from time to time by Academic Council on the recommendation of Board of studies and has been recorded his/her observations in the laboratory journal and written a report on each exercise performed. Every journal is to be checked and signed periodically by a member teaching staff and certified by the Head of the Department at the end of staff and certified by the Head of the Department at the end of the year. Candidates are to produce their journal at the time of practical examination. Candidates have to visit the least

Two (2) places of Microbiological interest (Pharmaceutical industry, Dairy, Research institutes etc.) and submit the report of their visit at the time of examination. The report should be duly certified by the Head of the Department.

Nature of question paper and distribution of marks for B.Sc. Part III

Microbiology Practical Examination

Practicals I, II, III & IV

Q.1 Major Experiment 20 Marks

Q. 2 Minor Experiment 15 Marks

Q.3 Journal 05 Marks

SPOTTING 10 Marks

VIVA-VOCE 10 Marks

(On practicals not attempted in the examination)

TOUR REPORT: 20 MARKS

Nature of Question Paper

Instructions: 1) All the questions are **compulsory**.

2) Figures to the right indicate **full** marks.

3) Draw neat labeled diagrams **wherever** necessary.

4) Use of calculator is allowed.

Time: 2 hours

Total Marks: 35

PAPER IX/X/XI/XII

Q.1.A Select correct alternative. (5)

i)

a) b) c) d)

ii)

a) b) c) d)

iii)

a) b) c) d)

iv)

a) b) c) d)

v)

a) b) c) d)

Q.1 B Fill in the blanks (2)

i)

ii)

Q.2. Attempt any Two. (16)

i)

ii)

iii)

Q.3. Attempt any three (12)

i)

ii)

iii)

iv)

v)

Instruction to paper setters: Equal weight age should be given to all units.

For Continuous Internal Examination: (15 marks)

Mandatory 1) Presenty ---- (5 marks)

***Select any one for B.Sc.III ---- (10 marks)**

1) Unit test

2) Home assignment

3) Project

4) Seminar

*Yet it is not finalized

SCHEME OF MARKING (THEROY)

Sem.	Core Course	Marks	Evaluation	Paper	Answer Books	Standard of passing
V	DSE E 1	35	Semester wise	Each paper of 35 marks	As per Instruction	35% (12 marks)
V	DSE E 2	35	Semester wise	Each paper of 35 marks	As per Instruction	35% (12 marks)
V	DSE E 3	35	Semester wise	Each paper of 35 marks	As per Instruction	35% (12 marks)
V	DSE E4	35	Semester wise	Each paper of 35 marks	As per Instruction	35% (12 marks)

SCHEME OF MARKING (CIE) Continuous Internal Evaluation

Sem.	Core Course	Marks	Evaluation	Paper	Answer Books	Standard of passing
V	DSE E 1	15	Semester wise	one	As per Instruction	35% (6 marks)
	DSE E 2	15	Semester wise	one	As per Instruction	35% (6 marks)
	DSE E 3	15	Semester wise	one	As per Instruction	35% (6 marks)
	DSE E 4	15	Semester wise	one	As per Instruction	35% (6 marks)

SCHEME OF MARKING (PRACTICAL)

Sem.	Course	Marks	Evaluation	Sections	Standard of passing
V AND VI	Practical I,II,III&IV	200	Annual	As per Instruction	35%

***A separate passing is mandatory**

Dissemination of Education for Knowledge, Science and Culture”
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha’s
Vivekanand College, Kolhapur (Autonomous)



DEPARTMENT OF MATHEMATICS

**M.Sc. Part - II
Semester-II & IV**

SYLLABUS

Under Choice Based Credit System

to be implemented from Academic Year 2019-20

M.Sc. II (Sem -III and IV) Mathematics
Course Structure
Semester III

Course code	Title o the course	Instructions Lectures /Week	Duration of term end exam	Marks Term end exam	Marks (Internal) Continuous Assessment	Credit
Compulsory Courses						
CP-1180C	Functional Analysis	5	3 hours	90	30	5
CP-1181C	Advanced Discrete Mathematics	5	3 hours	90	30	5
Optional Courses						
CP-1182C	Number Theory	5	3 hours	90	30	5
CP-1183C	Graph Theory	5	3 hours	90	30	5
CP-1184C	Operational Research I	5	3 hours	90	30	5
CP-1185C	Lattice Theory I	5	3 hours	90	30	5
CP-1186C	Dynamical System I	5	3 hours	90	30	5
CP-1187C	Commutative Algebra	5	3 hours	90	30	5

Semester IV

Course code	Title o the course	Instructions Lectures /Week	Duration of term end exam	Marks Term end exam	Marks (Internal) Continuous Assessment	Credit
Compulsory Courses						
CP-1190D	Field Theory	5	3 hours	90	30	5
CP-1191D	Integral Equations	5	3 hours	90	30	5
Optional Courses						
CP-1192D	Algebraic Number Theory	5	3 hours	90	30	5
CP-1193D	Graph Theory II	5	3 hours	90	30	5
CP-1194D	Operational Research II	5	3 hours	90	30	5
CP-1195D	Fluid Dynamic	5	3 hours	90	30	5
CP-1196D	Dynamical System II	5	3 hours	90	30	5
CP-1197D	Combinatorics	5	3 hours	90	30	5
CP - 1198D	Fractional Differential Equation	5	3 hours	90	30	5

M.Sc. Mathematics Part - II CBCS
Semester - III Paper- I
Functional Analysis (CP-1180C)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

- CO1 To familiarize the students with the fundamental topics, principles and methods of functional analysis
- CO2 Understand and apply fundamental theorems from the theory of normed and Banach spaces, including the Hahn-Banach theorem, the open mapping theorem, the closed graph theorem.
- CO3 Able to understand Hilbert space and its application and acquire knowledge of orthogonal sets and operators
- CO4 Understand Adjoint of an operator on a Hilbert space and concept of projection, self - adjoint, normal and unitary operator.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Normed linear spaces, Banach spaces, Quotient spaces, Continuous linear transformations, Equivalent norms, Finite dimensional normed spaces and properties, Conjugate space and separability, The Hahn-Banach theorem and its consequences.	15	1
Module 2	Second conjugate space, the natural embedding of the normed linear space in its second conjugate space, Reflexivity of normed spaces, Weak * topology on the conjugate space. The open mapping theorem, Projection on Banach space, the closed graph theorem, the conjugate of an operator, the uniform boundedness principle.	15	1
Module 3	Hilbert spaces: examples and elementary properties, Orthogonal complements, The projection theorem, Orthogonal sets, The Bessel's inequality, Fourier expansion and Parseval's equation, separable Hilbert spaces, The conjugate of Hilbert space, Riesz's theorem, The adjoint of an operator.	15	1
Module 4	Self adjoint operators, Normal and Unitary operators, Projections, Eigen values and eigenvectors of an operator on a Hilbert space, The determinants and spectrum of an operator, The spectral theorem on a finite dimensional Hilbert space.	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

- 1) G. F. Simmons: Introduction to Topology and Modern Analysis, Tata McGraw Hill,1963.
- 2) Erwin Kreyszig: Introductory Functional Analysis with Applications, John Wiley and Sons, 1978
- 3) G. Bachman and L. Narici: Functional Analysis, Academic Press, 1972.
- 4) A. E. Taylor: Introduction to Functional analysis, John Wiley and sons,1958.
- 5) J. B. Convey, A course in Functional Analysis, Springer-Verlag, 1985.
- 6) B. V. Limaye: Functioned Analysis, New age international, 1996

M.Sc. Mathematics Part - II CBCS
Semester - III Paper- II
Advanced Discrete Mathematics (CP-1181C)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

- CO1 Solve discrete probability problems and use set to solve problems in combinatorics and probability theory.
- CO2 Determine if a given graph is simple or a multigraph, directed or undirected graph, cyclic or acyclic, and determine the connectivity of a graph.
- CO3 To determine if graph has a Euler or a Hamiltonian path or circuit, Define Pigeonhole principle and solve problems related to this.
- CO4 Identify the types of Lattices and find supremum and infimum.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Graph Theory: Definition, examples and properties, Simple graph, Graph isomorphism, Bipartite graphs, Complete Bipartite graph, regular graph, sub-graphs spanning sub-graph, Edge deleted sub-graph, Vertex deleted sub-graph, Union and intersection of two graphs, complements of a graph, self-complementary graph, paths and cycles in a graph, ECPentricity, radius and diameter of a connected graph, Peterson graph, Wheel graph. Isomorphism of Graphs. First theorem of graph theory.	15	1
Module 2	The Matrix representation of a graph, Adjacency matrix and Incidence matrix of a graph, Definition and simple properties of a tree, bridges, spanning trees, Inclusion exclusion principle. Simple examples on Inclusion exclusion principal Pigeonhole principle, examples on Pigeonhole principle.	15	1
Module 3	Discrete numeric functions and sum and product of two numeric functions, generating functions, Linear recurrence relations with constant coefficients Particular solutions of linear recurrence relations, Total solutions.	15	1
Module 4	Ordered sets and lattices Hasse diagrams of posets, Supremum and infimum, Isomorphic ordered sets, well-ordered sets, Lattices, Bounded lattices, Distributive lattices, Complements complemented lattices, Boolean algebra, Basic definitions, Basic theorems, duality, Boolean algebras as lattices	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

1. Lipschitz and Mark Lipson: Discrete Mathematics (second edition) , Tata McGraw Hill Publishing Company Ltd. New Delhi
2. Gorrett Birkhoff : Lattice Theory 2. Rich and Brualdi : Combinatoric
3. John Clark and Derek Holton: A first book at Graph Theory Applied Publishers Ltd.
4. C. T. Liu: Discrete Mathematics

M.Sc. Mathematics Part - II CBCS
Semester - III Paper- III
Number Theory (CBC-1182C)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

CO1 : Learn more advanced properties of primes and pseudo primes.

CO2 : Able to apply Mobius Inversion formula to number theoretic functions.

CO3 : Able to explore basic idea of cryptography.

CO4 : Understand concept of primitive roots and index of an integer relative to a given primitive root

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Review of Divisibility: The division algorithm, G.C.D., Euclidean algorithm, Diophantine equation $ax + by = c$, Primes and their distribution: Fundamental theorem of arithmetic, The Goldbach Conjecture.	15	1
Module 2	Congruences: Properties of congruences, Linear congruences, Chinese Remainder Theorem, Special divisibility tests, Fermat's theorem, Wilson's theorem and applications	15	1
Module 3	Number Theoretic Functions: Euler's phi function, Euler's theorem, Greatest integer function, The functions r and σ , Mobius function and Mobius inversion formula, Properties of these functions and their inter relations.	15	1
Module 4	Primitive roots: The order of an integer modulo n , Primitive roots of primes, composite numbers having primitive roots, The theory of indices, The quadratic reciprocity law: Eulerian criteria, The Legendre symbol and its properties, quadratic reciprocity, quadratic reciprocity with composite moduli.	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

- 1) D. M. Burton : Elementary Number Theory, Universal book stall, New Delhi.
- 2) S. B. Malik : Basic Number theory Vikas publishing House.
- 3) George E. Andrews : Number theory, Hindustan Pub. Corp.(1972)
- 4) Niven, Zuckerman: An Introduction to theory of numbers. John Wiley & Sons

5) S. G. Telang, Number Theory, Tata Mc. Graw-Hill Publishing Co., New Delhi.

M.Sc. Mathematics Part - II CBCS
Semester - III Paper -IV
Graph Theory I (CBC-1183C)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

CO1 : Understand and explore the basics of graph theory.

CO2 : Define vertex colouring and prove theorems on vertex colouring.

CO3 : Derive properties of planarity and Euler's formula.

CO4 : Evaluate or synthesize any real -world applications using graph theory

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Trees and connectivity: Definitions and simple properties , Bridges , spanning trees , cutvertices and connectivity , Euler tours : Euler graphs, properties of Euler graph, The Chinese postman problem, Fleury's algorithm.	15	1
Module 2	Hamiltonian Cycles: Hamiltonian graph. The travelling salesman problem. Matchings : Matching and Augmenting path , The marriage problem , The personal assignment problem.	15	1
Module 3	The optimal assignment problem, A Chinese postman problem, Postscript Planar graph : Plane and Planar graphs, Euler formula, Platonic bodies Kurotowskis theorem. Non Hamiltonian plane graphs ,The dual of a plane graph	15	1
Module 4	Coloring : Vertex coloring , vertex coloring algorithms, critical graphs . cliques, Edgecoloring, map coloring. Directed graphs :Defination, Indegree and Outdegree, Tournaments , Traffic flow.	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

- 1) John Clark and Derek Holton : A first look at graph theory, Allied publishers Ltd. Bombay.
- 2) Douglas B. West : Introduction to Graph Theory Person Education Asia.
- 3) F. Harary - Graph Theory, Narosa publishing house (1989).
- 4) K.R.Parthsarthy : Basic Graph Theory, Tata McGraw Hill publishing Co.Ltd. New delhi.

M.Sc. Mathematics Part - II CBCS
Semester - III Paper-V
Operational Research -I (CBC-1184C)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

- CO1 Able to identify convex set and convex functions and construct linear integer programming models discuss the solution techniques
- CO2 Solve multi -level decision problems using dynamic programming method.
- CO3 Identify the appropriate methods to solve the different kinds of Optimization Problems.
- CO4 Formulate the nonlinear programming models and able to find solution methods for solving the nonlinear and linear optimization problems.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Convex sets and their properties. Lines and hyper planes convex set Important Theorems, polyhedral convex set, convex combination of vectors, convex hull, convex polyhedron, convex cone, simplex and convex function, General formulation of linear programming Matrix form of LP problem, definitions of standard LPP., Fundamental Theorem of linear programming.	15	1
Module 2	Simplex method, computational procedure of simplex method, problem of degeneracy and method to resolve degeneracy. Revised simplex method in standard form I, Duality in linear programming duality theorems, Integer linear programming, Gomory's cutting plane method, Branch and Bound method.	15	1
Module 3	Dynamic programming. Bellman's principle of Optimality, solution of problems with a finite number of stages. Application of dynamic programming in production, inventory control and linear programming.	15	1
Module 4	Nonlinear programming unconstrained problems of maximum and minimum Lagrangian method Kuhn Tucker necessary and sufficient conditions, Wolfe's method, Beale's method.	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

1. S. D. Sharma: Operations Research, Kedar Nath Ram Noth and co
2. Kanti Swarup, P. K. Gupta and Manmohan : Operations research, S. Chand & Co.
3. Hamady Taha: Operations Research: Mac Millan Co.
4. S. D. Sharma: Nonlinear and Dynamic programming Kedar Nath Ram Nath and Co. Meerut
5. R. K. Gupta: Operations Research Krishna Prakashan Mandir, Meeru
6. G. Hadley: Linear programming Oxford and IBH Publishing Co.

M.Sc. Mathematics Part – II CBCS
Semester - III Paper-VI
Lattice Theory-I (CBC-1185C)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to –

CO1 : Understand the relation between posets and lattices

CO2 : Study the basic properties and characterization of lattice

CO3 : Understand and apply the distributive complemented lattice

CO4 : Design analyse and implement the concepts of stone's theorem and its consequence, pseudo complemented lattices and it's dual

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Basic concepts 1. Posets, Definition and examples of posets. 2. Two definitions of lattices and their equivalence, examples of lattices. 3. Description of Lattices, some algebraic concepts. 4. Duality principle, Specialelements. 5. Homomorphism, Isomorphism and isotone maps.	15	1
Module 2	Special types of Lattices 1. Distributive lattices – Properties and characterizations. 2. Modular lattices – Properties and characterizations. 3. Congruence relations. 4. Boolean algebras – Properties and characterizations.	15	1
Module 3	Ideal theory 1. Ideals and filters in lattices. 2. Lattice of all ideals $I(L)$. 3. Properties and characterizations of $I(L)$. Stone's theorem and its consequences	15	1
Module 4	Stone algebra 1. Pseudo complemented lattices. 2. $S(L)$ and $D(L)$ – special subsets of pseudo complemented lattices. 3. Distributive pseudo complemented lattice. 4. Stone lattices – properties and characterizations.	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

1. Lattice theory: First concepts and distributive lattices by George Grätzer, W. H. Freeman and company, San Francisco, 1971.
2. B. V. Davey and H. A. Priestley: Introduction to Lattices and Order, Cambridge University Press, Second edition, 2002.

M.Sc. Mathematics Part - II CBCS
Semester - III Paper-VII
Dynamical System -I (CBC-1186C)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

- CO1 Classify equilibrium points of the dynamical system
- CO2 Construct bifurcation diagrams and analyze the system for different values of parameter.
- CO3 Relate the qualitative properties of the system with the eigen values of coefficient matrix.
- CO4 Construct the exponential of a matrix and apply it to solve the dynamical system.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	First order systems- Qualitative Analysis: Introduction: First order linear systems, equilibrium points- classification, stability, bifurcation, phase portraits, Scalar autonomous non-linear systems, Stability (linearization, equilibrium points), phase portraits- slope fields, Examples, two-parameterfamily.	15	1
Module 2	Special types of Lattices Second order linear ODE as a system of first order ODEs, preliminaries from algebra, eigenvalues and eigenvectors, solution of planar linear systems, Phase portraits for planar systems: Real distinct eigenvalues, complex eigenvalues, repeated eigenvalues, changing co-ordinates, Classification of planar systems: the trace-determinant plane	15	1
Module 3	Higher order systems: Preliminaries from linear algebra, Higher order ODEs as a vector differential equation, real distinct, complex and repeated eigenvalues, The Exponential of a Matrix, Solving a system of first order differential equations by using exponential of a matrix, Non-autonomous systems of the form $X'(t) = AX(t) + G(t)$, Variation of parameters	15	1
Module 4	Discrete dynamical systems: Introduction to the discrete maps (iterative maps), orbit, periodic points, cobweb plots, Fixed points of a map, stability analysis of a fixed point (sink, source, saddle), Bifurcation and chaos: Standard examples (Logistic map, tent map, doubling map).	15	1
Module 5	Examples, seminars, group discussions on above four	15	1

Reference Books:

1. M. Hirsch, S. Smale and R. L. Devaney : Differential equations, dynamical systems, and an introduction to chaos , Elsevier Academic Press, USA, 2004
2. Differential equations, dynamical systems, and an introduction to chaos by M. Hirsch, S. Smale and R. L. Devaney, Elsevier Academic Press, USA, 2004

M.Sc. Mathematics Part - II CBCS
Semester - III Paper-VIII
Commutative Algebra (CBC-1187C)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

- CO1 Classify the ideals to solve the related problems.
- CO2 Understand various radicals and know Hilbert basis theorem and apply it to other development
- CO3 Use Nakayama Lemma for further development in Noetherion Rings.
- CO4 Derive the Krull intersection theorem.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Rings and ring homomorphism, Ideals. Quotient rings, Zero divisors. Nilpotent elements. Units, Prime ideals and Maximal ideals, Nilradicals and Jacobson radical, Operations on ideals, Extension and contraction	15	1
Module 2	Modules and modules homomorphisms, Submodules and quotient modules , Operations On submodules ,Direct sum and product ,Finitely generated modules ,Exact sequences	15	1
Module 3	Tensor product of modules , Restriction and extension of scalars , Exactness properties Of the tensor product , Algebras of tensor products	15	1
Module 4	Rings and modules of fractions, Local properties , Extended and contracted ideals in rings of fractions , primary decomposition	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

1. M. F. Atiyah and I. G. MacDonald - Introduction to commutative Algebra, Addison Wesley publishing company
2. M.D. Larsen and P. J. MCParthy ; Multiplicative theory of ideals, Academic press,1971
3. D.G. Nortcot Ideal theory, Cambridge University press,1953

M.Sc. Mathematics Part - II CBCS
Semester - IV Paper-I
Field Theory (CP-1190D)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

- CO1 Apply the knowledge of algebra to attain a good mathematical maturity and enables to build mathematical thinking and reasoning
- CO2 Identify and analyse different types of algebraic structures such as algebraically closed fields, splitting fields, finite field extension to understand and use the fundamental results in Algebra
- CO3 Design analyse and implement the concepts of Gauss lemma, separable extension etc.
- CO4 Identify the challenging problems in advanced algebra to pursue further research

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Field Extensions Extension of a field, Algebraic extensions, algebraically closed fields, Derivatives and multiple roots, Finite Fields	15	1
Module 2	Galois Theory Separable and normal extensions, Automorphism groups and fixed fields, Fundamental theorem of Galois theory	15	1
Module 3	Finite Fields Prime fields, Fundamental theorem of algebra, Cyclic extensions, Cyclotomic extensions	15	1
Module 4	Applications of Galois theory Constructions by ruler and compass, Solvable groups, Polynomials solvable by radicals	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

1. U. M. Swamy, A. V. S. N. Murthy, Algebra: Abstract and Modern, Pearson Education, 2012
2. Nathan Jacobson, Basic Algebra I, second edition, W. H. Freeman and company, New York
3. M. Artin, Algebra, PHI, 1996.
4. N. Herstein, Topics in Algebra, Wiley Eastern Ltd.
5. Bhattacharya, Jain and Nagpal, Basic Abstract Algebra, 2nd edition, Narosa Publishing House, New Delhi
6. John Fraleigh : A first course in Abstract Algebra (3rd edition) Narosa publishing house, New Delhi.

M.Sc. Mathematics Part - II CBCS
Semester - IV Paper-II
Integral Equations (CP-1191D)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

CO1 : Solve linear Volterra and Fredholm integral equations using appropriate methods.

CO2 : Understand the relationship between integral and differential equations and transform one type into another.

CO3 : Find out the iterate kernel and Resolvent kernel of Volterra, Fredholm integral equation.

CO4 : Formulate and solve initial and boundary value problems for the heat and wave equations in spherical and cylindrical coordinates

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Classification of linear integral equations, Conversion of initial value problem to Volterra integral equation, Conversion of boundary value problem to Fredholm integral equation, Separable kernel, Fredholm integral equation with separable kernel, Fredholm alternative. Homogeneous Fredholm equations and eigen functions	15	1
Module 2	Solutions of Fredholm integral equations by: Successive approximations Method, Successive substitution Method, Adomian decomposition method, Modified decomposition method, Resolvent kernel of Fredholm equations and its properties, Solutions of Volterra integral equations: Successive approximations method, Neumann series, Successive substitution Method.	15	1
Module 3	Solution of Volterra integral equations by Adomian decomposition method, and the modified decomposition method, Resolvent kernel of Volterra equations and its properties, Convolution type kernels, Applications of Laplace and Fourier transforms to solutions of Volterra integral equations, Symmetric Kernels: Fundamental properties of eigenvalues and eigenfunctions for symmetric kernels, expansion in eigenfunctions and bilinear form.	15	1
Module 4	Hilbert Schmidt Theorem and its consequences, Solution of symmetric integral equations, Operator method in the theory of integral equations, Solution of Volterra and Fredholm integrodifferential equations by Adomian decomposition method, Green's function: Definition, Construction of Green's function and its use in solving boundary value problems..	15	1
Module 5	Examples, seminars, group discussions on above four	15	1

Reference Books:

- 1) R. P. Kanwal, Linear Integral Equation- Theory and Technique, Academic Press, 1971.
- 2) Abdul-Majid Wazwaz, Linear and Nonlinear Integral Equations- Methods and Applications, Springer, 2011
- 3) L. G. Chambers, Integral Equations- A Short Course, International Text Book Company, 1976.
- 4) M. A, Krasnov, et.al. Problems and exercises in Integral equations, Mir Publishers, 1971.
- 5) J. A. Cochran, The Analysis of Linear Integral Equations, Mc Graw Hill Publications,

M.Sc. Mathematics Part – II CBCS
Semester – IV Paper-III
Algebraic Number Theory (CP-1192D)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

- CO1 Understand The concept (definition and significance) of algebraic numbers and algebraic integers.
- CO2 Understand and clearly define number fields and their ring of integers, in particular quadratic number fields and cyclotomic number fields.
- CO3 Able to factorize an algebraic integer into irreducible and find the ideals of an algebraic number ring.
- CO4 Able to compute the class groups and the group of units of a number field.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Revision of rings, polynomial rings and fields, Field extensions, Symmetric polynomials, Modules, Free Abelian groups.	15	1
Module 2	Algebraic Numbers, Algebraic number fields, Conjugates and Discriminants, Algebraic integers, Integral Bases, Norms and Traces, Ring of integers, Quadratic fields, Cyclotomic fields.	15	1
Module 3	Factorization into irreducible, Noetherian rings, Dedekind rings, Examples of Non- Unique factorization into irreducible, Prime factorization, Euclidean Domains, Euclidean quadratic fields.	15	1
Module 4	Ideals, Prime factorization of ideals, Norm of an ideal, Nonunique factorization in cyclotomic fields, Two-squares theorem, Four-squares theorem, class groups and class numbers, Finiteness of the Class groups .	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

1. I.N. Stewart & D.O. Tall, Algebraic Number Theory , Academic press.
2. N. Jacobson, Basic Algebra - I, Hindustan Publishing Corporation (India), Delhi.
3. P. Samuel, Algebraic Theory of Numbers, Hermann, Paris (1970).
4. Mathematical Pamphlet, Algebraic Number Theory, TIFR, Bombay.

5. Paulo Ribenboim, *Classical Theory of Algebraic Numbers*, Springer, New York (2001).
6. N.S. Gopalkrishnan, *University Algebra*, New Age International(P) Ltd. Publisher.

M.Sc. Mathematics Part - II CBCS
Semester - IV Paper-IV
Graph Theory -II (CP-1193D)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to –

CO1 : Analyse the significance of graph theory in different engineering disciplines

CO2 : Demonstrate algorithms used in interdisciplinary engineering domains

CO3 : Explain the properties of trees and connectivity

CO4 : Explain major theorems and inventions in the history of graph theory and understand how it made the subject to develop to the present state.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Preliminaries, Incidence Matrix : Rank, Minors, Path Matrix, Integer generalized inverse, Moore –Perose inverse, 0-1 incidence matrix, matchings in bipartite graphs.	15	1
Module 2	Adjacency Matrix, Eigenvalues of some graphs, Determinant, Bounds, Energy of graphs, Antiadjacency matrix of directed graph, nonsingular trees	15	1
Module 3	Laplacian matrix : Basic properties, Computing Laplacian eigen values, Marrix tree theorem, Bounds for Laplacian special radius, Edge – Laplacian of a tree, Cycles and cuts, Fundamental cycles and fundamental cut, Fundamental matrices, Minors.	15	1
Module 4	Regular graphs :Person – Frobinius Theory, Adjacency algebra of regular graphs, Strongly regular graph and Friendship theorem, Graphs with maximum energy, Algebraic connectivity, classification of trees, spanning trees and binary trees. Kruskal's Algorithm for shortest spanning trees.	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

- 1 R.B. Bapat : Graphs and matrices, Hindustan book agency.
- 2 Douglas B. West : Introduction to Graph Theory Person Education Asia.
- 3 F. Harary – Graph Theory, Narosa publishing house (1989).

M.Sc. Mathematics Part - II CBCS
Semester - IV Paper-V
Operational Research -II (CP-1194D)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

- CO1 Decide an optimal replacement period/policy for a given item/equipment/machine
- CO2 Understand the various selective inventory control techniques and its applications. Capability to develop deterministic inventory models
- CO3 Understand the mathematical modeling of queuing systems To apply and extend queueing models to analyze real world systems.
- CO4 Understand application of PERT and CPM techniques and able to construct network diagrams

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Replacement Problems, Failure mechanism of items, Replacement policy for items whose maintenance cost increases with time and money values is constant, Group replacement of items that fail completely	15	1
Module 2	Inventory - Cost involved in inventory problems, variables in inventory problem, symbols in inventory concept of EOQ, Methods with calculus method ,Model I (a) The economic lot size system with uniform demand, Model I (b) Economic lot size with different rates of demand in different cycles.,Model I (c) Economic lot size with finite Rate of Replenishment.,(EOQ production model) EOQ model with shortages , Model II(a) The EOQ with constant rate of demand, scheduling, time constant.	15	1
Module 3	Queuing Theory, Queuing systems, Queuing Problems: transient and steady states, traffic intensity, Probability distributions in Queuing systems Poisson process, Properties, Exponential process, Classification of Queuing Models,Model I:(M/M/I) : (∞ /FCFS), Model II (a) : General Erlang queuing model.	15	1
Module 4	Information Theory: Communication process, Quantitative measure of information, A binary unit of information, measure of uncertainty of entropy, basic properties of entropy function (H) Joint and conditional entropies, Uniqueness theorem, Chanel capacity, efficiency and redundancy Encoding, Shannon Fano encoding procedure, PERT / CPM: Applications of PERT /CPM techniques, Network diagram, representations. Rules for constructing the Network diagram, determination of the critical path	15	1

Module 5	Examples, seminars, group discussions on above four units	15	1
----------	---	----	---

Reference Books:

1. S.D.Sharma : Operations Research Kedarnath and co. 1999.
2. KantiSwarup ,P.K.Gupta and Manmohan : Operations research, S.Chand& Co.
3. HamadyTaha : Operations Research :Mac Millan Co.
4. R.K.Gupta : Operations Research Krishna PrakashanMandir, Meerut

M.Sc. Mathematics Part - II CBCS
Semester - IV Paper-VI
Fluid Dynamics (CP-1195D)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

CO1 : Apply Bernoulli's equation to fluid flow problems and boundary layer theory to determine lift and drag forces on a submerged body.

CO2 : Apply appropriate equations and principles to analyze pipe flow problems.

CO3 : solve inviscid flow problems using stream functions and velocity potentials

CO4 : Apply concepts of mass, momentum and energy conservation to flows

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Physical properties of fluids and kinematics of fluids: Concepts of fluids, continuum hypothesis, density, specific weight, specific volume, pressure, viscosity, surface tension, Eulerian & Lagrangian methods of description of fluids, Equivalence Eulerian and Lagrangian method, General motion of a fluid element, Integrability and compatibility conditions, stream lines, pathlines, streak lines, stream function, vortex lines, circulation	15	1
Module 2	Stresses in fluids: Strain rate tensor, stress tensor, normal stress, shearing stress, symmetry of stress tensor, Transformation of stress components from one co-ordinate system to another, principle axes and principle values of stress tensor. Newtonian fluids, non Newtonian fluids, purely viscous fluids, Constitutive equations	15	1
Module 3	Conservation laws: Equation of conservation of mass, equation of conservation of momentum, Navier-Stokes equation, equation of moment of momentum, Equation of energy, Basic equations in different co-ordinate systems: Cartesian co-ordinate system, Cylindrical coordinate system, Spherical co-ordinate system, general orthogonal curvilinear co-ordinate system, boundary conditions.	15	1
Module 4	Rotational and irrotational flows, Dynamic Similarity: Theorems about rotational and irrotational flows: Kelvin's minimum energy theorem, Gauss theorem, Kinetic energy of an infinite fluid, uniqueness of irrotational flows Bernoulli's equation, Bernoulli's equation for irrotational flows, Two dimensional irrotational incompressible flows, Blasius theorem, circle theorem, Sources and sinks,	15	1

	sources, sinks and doublets in two dimensional flows, Methods of images. Dimensional analysis, Non dimensional numbers, some applications of non-dimensional analysis.		
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

1. An introduction to Fluid Dynamics' R. K. Rathy, Oxford & IBH publishing company
2. Text book of Fluid Dynamics' F. Chorton CHS Publishers, Delhi, 1985

M.Sc. Mathematics Part - II CBCS
Semester - IV Paper-VII
Dynamical System II (CP-1196D)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

- CO1 Test for the existence and uniqueness of solution of nonlinear system.
- CO2 Relate the stability of the system with its linearization.
- CO3 Distinguish between stable and unstable sets corresponding to the given system.
- CO4 Identify the chaotic behavior in the system by using Lyapunov exponents.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Basic concepts of nonlinear dynamics: Introduction, Historical developments, Autonomous system of nonlinear ODEs: fundamental existence and uniqueness of solution, dependence of solution on initial conditions and parameters, The maximal interval of existence.	15	1
Module 2	Stability analysis: The flow defined by a differential equation, Linearization, Stable manifold theorem, Hartman Grobman theorem, Stability and Lyapunov functions, Bifurcation.	15	1
Module 3	II Chaos: Concept, properties, Limit sets and attractors, Poincare-Bendixson theorem, The Poincare map, Lyapunov exponents in flows, Numerical computation of Lyapunov exponents, Examples: Lorenz system, Chua circuit, Rossler attractor, Forced oscillators, Chaos synchronization.	15	1
Module 4	Applications and computer experiments: Application of chaos to secure communication, Introduction to fractals, Use of computer software's to solve problems in Dynamical Systems: Solving linear and nonlinear systems, data visualization-2D and 3D plots, vector field plots, chaotic phase portraits, solving discrete systems- cobweb plots.	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

1. Perko Differential Equations and Dynamical Systems, Springer, New York.
2. Alligood, Sauer and Yorke Chaos - an introduction to dynamical systems, Springer, New York.

3. M. Hirsch, Smale and R.L. Devaney Differential equations, dynamical systems, and an introduction to chaos, Elsevier Academic Press, USA, 2004.
4. Strogatz, Nonlinear dynamics and chaos, , Perseus Books, New York.
5. Wiggins, Introduction to applied nonlinear dynamics and chaos, Springer, New York.
6. Arrowsmith and Place Dynamical systems: differential equations, maps and chaotic behavior, Chapman and Hall, London.
(Applications)

M.Sc. Mathematics Part - II CBCS
Semester - IV Paper-VIII
Combinatorics (CP-1197D)

Theory: 60Hour

Credits -05

- Course Outcomes:** After the completion of the course the student will be able to -
- CO1 Students will familiar with fundamental combinatorial structures than naturally appears in various other field of mathematics.
 - CO2 Learn how to use those structure to represent mathematical applied questions.
 - CO3 Able to use generating function to solve a variety of combinatorial problems.
 - CO4 Identify the challenging problems in arrangement and selections.

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	The sum Rule and the product Rule, Permutations and combinations, The Pigeonhole Principle, Ramsey Numbers, Catalan Numbers, Stirling Numbers.	15	1
Module 2	Generalized Permutations and combinations, Multinomial Theorem, The Inclusion - Exclusion principle, Sieve's formula, Derangements, System of Distinct Representatives (SDR), Combinatorial Number theory.	15	1
Module 3	Rook- Polynomial, Ordinary and Exponential generating functions, Partitions of a positive integer, Recurrence Relations, FibonaCPi sequence.	15	1
Module 4	Group Theory in Combinatorics, The Burnside Frobenius Theorem, Permutation Groups and Their Cycle Indices, Polya's Enumeration Theorems.	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

1. V.K. Balakrishnan Schum's Outline of Theory and problems of combinatorics. Schum's Outline
Series Mc. Grew Hill INC
2. Alan Tucker - Applied Combinatorics. - John Willey Sons.
3. Richard A Broadly, Introductory combinatorics New Holland.
4. Sharad Sane- Combinatorial Techniques-Hindustan Book Agency

M.Sc. Mathematics Part - II CBCS
Semester - IV Paper-IX
Fractional Differential Calculus (CP-1198D)

Theory: 60Hour

Credits -05

Course Outcomes: After the completion of the course the student will be able to -

- CO1 Understand G-L and RL-fractional integral and evaluate fractional integrals of some common functions
- CO2 RL and Caputo-fractional derivatives and evaluate fractional derivatives of some common functions
- CO3 To Solve Linear Fractional Differential Equation using the Laplace and Mellin transform.
- CO4 The study of fractional differential

Unit	Syllabus	Lectures/ Teaching Hours	Credits
Module 1	Brief review of Special Functions of the Fractional Calculus: Gamma Function, Mittag-Leffler Function, Wright Function, Fractional Derivative and Integrals: Grünwald-Letnikov (GL) Fractional Derivatives- Unification of integer order derivatives and integrals, GL Derivatives of arbitrary order, GL fractional derivative of , Composition of GL derivative with integer order derivatives, Composition of two GL derivatives of different orders. Riemann-Liouville (RL) fractional derivatives- Unification of integer order derivatives and integrals, Integrals of arbitrary order, RL derivatives of arbitrary order.	15	1
Module 2	Composition of RL derivative with integer order derivatives and fractional derivatives, Link of RL derivative to Grünwald-Letnikov approach, Caputo's fractional derivative, generalized functions approach, Left and right fractional derivatives. Properties of fractional derivatives: Linearity, The Leibnitz rule for fractional derivatives, Fractional derivative for composite function, Riemann-Liouville fractional differentiation of an integral depending on a parameter, Behaviour near the lower terminal, Behaviour far from the lower theory.	15	1
Module 3	Laplace transforms of fractional derivatives- Laplace transform of the RiemannLiouville fractional derivative, Caputo derivative and Grünwald-Letnikov fractional derivative. Fourier transforms of fractional integrals and derivatives. Mellin transforms of fractional derivatives- Mellin transforms of the Riemann-Liouville fractional	15	1

	integrals and fractional derivative, Mellin transforms of Caputo derivative.		
Module 4	Existence and uniqueness theorem: Linear fractional differential equations (FDE), Fractional differential equation of a general form, Existence and uniqueness theorem as a method of solution. Dependence of a solution on initial conditions. Methods of solving FDE's: The Laplace transform method. The Mellin transform method, Power series method.	15	1
Module 5	Examples, seminars, group discussions on above four units	15	1

Reference Books:

1. Igor Podlubny, Fractional differential equations. San Diego: Academic Press; 1999.
2. A. Kilbas, H.M. Srivastava, J.J. Trujillo, Theory and Applications of Fractional Differential Equations, Elsevier, Amsterdam, 2006.
3. Kai Diethelm, The Analysis of Fractional Differential Equations, Springer, 2010.
L. Debnath, D. Bhatta, Integral Transforms and Their Applications, CRC Press

SCHEME OF MARKING (THEROY)

Sem.	CP	Marks	Evaluation	Answer Books	Standard of passing
I	CP-1180C TO CP1187 A	90	Semesterwise	As per Instruction	35% (36 marks)
II	CP-1190D TO CP-1198D	90	Semesterwise	As per Instruction	35% (36 marks)

SCHEME OF MARKING (CIE) Continuous Internal Evaluation

Sem.	CP	Marks	Evaluation	Answer Books	Standard of passing
I	CP1180C TO CBC1187C	30	Concurrent	As per Instruction	35% (12 marks)
II	CP-1190D TO CBC-1198D	30	Concurrent	As per Instruction	35% (12 marks)

***A separate passing is mandatory**

Nature of Question Paper

Instructions: 1) Questions No. 1 is compulsory.

2) Attempt any **four** questions from que. no. 2 to que. no. 7.

3) All questions carry equal marks.

4) Figures to right indicates full marks.

5) Use of log table/calculator is allowed.

Time: 3 hours

Total Marks: 90

Q. 1. A) Choose correct alternative. (2 Marks each)

[08]

i)

A)

B)

C)

D)

ii)

A)

B)

C)

D)

iii)

A)

B)

C)

D)

iv)

A)

B)

C)

D)

B) Fill in the blanks.

(2 Marks each)

[10]

Q.2. A)

B)

C)

OR

A)

B)

[18]

[18]

Q.3. A)

B)

C)

OR

A)

B)

[18]

[18]

Q.4 A) [18]
B)
C)

OR

A) [18]
B)

Q.5. A) [18]
B)
C)

OR

A) [18]
B)

Q.6. A) [18]
B)
C)

OR

A) [18]
B)

Q.7. A) [18]
B)
C)

OR

A) [18]
B)

.....
.....

REMARK:

Note that the distribution of marks for A, B, C or A, B (Q.N.2 to Q.N.-7) may vary according to the nature of question.