"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.C.A

B.C.A Part – II(NEP) Semester - III & IV

SYLLABUS

Under Choice Based Credit System
To be implemented from Academic Year 2024-25

BCA –II Semester- III & IV

Sr. No.	Course Abbr.	Course code	Course Name	Teaching Scheme Hours/week		Examination Scheme and Marks				Course Credits
				TH	PR	ESE	CIE	PR	Marks	
Semester-III										
1	DSC-V	DSC04COM31	Object Oriented Programming with C++	2	-	40	10	-	50	2
2	DSC-VI	DSC04COM32	Database Management System	2	-	40	10	-	50	2
3	MIN-V	MIN04MGT31	Entrepreneurship Development	2	-	40	10	-	50	2
4	MIN-VI	MIN04MGT32	Principles of Marketing	2	-	40	10	-	50	2
5	SEC-II	SEC04COM31	PHP-II	2	-	50	-	-	50	2
6	SEC-III	SEC04COM32	AI-I	2	-	50	-	-	50	2
7	AEC-III	AEC04ENG31	English	2	-	40	10	-	50	2
8	VEC-I	VEC04DEG31	Democracy, Election and Good Governance(DEGG)	2	-	50	-	-	50	2
9	VEC-II	VEC04EVS31	Environmental Science-I	2		50				2
10	DSC-PR-V	DSC04PRA39	DSCComputerLab-3A		4			50	50	2
11	DSC-PR-VI	DSC04PRB39	DSCComputerLab-3B		4			50	50	2
Total (Semester-III)				**18**	**8**	**400**	**50**	**100**	**550**	**22**
Semester-IV										
1	DSC-VII	DSC04COM41	Data Structure Using C++	2	-	40	10	-	50	2
2	DSC-VIII	DSC04COM42	RDBMS	2	-	40	10	-	50	2
3	MIN-VII	MIN04MGT41	Management Information System	2	-	40	10	-	50	2
4	MIN-VIII	MIN04MGT42	M-Commerce	2	-	40	10	-	50	2
5	SEC-IV	SEC04COM41	Software Engineering	2	-	50	-	-	50	2
6	SEC-V	SEC04COM42	AI-II	2	-	50	-	-	50	2
7	AEC-IV	AEC04ENG41	English	2	-	40	10	-	50	2
8	VEC-III	VEC04EVS41	Environmental Science-II	2		50				2
9	CC-I	CC04	Co-curricular Course	2		50				2
10	DSC-PR-VII	DSC04PRA49	DSCComputerLab-4A		4			50	50	2
11	DSC-PR-VIII	DSC04PRB49	DSCComputerLab-4B		4			50	50	2
Total (Semester-IV)				**18**	**8**	**400**	**50**	**100**	**550**	**22**
Cumulative Total (2nd Year)				**36**	**16**	**800**	**100**	**200**	**1100**	**44**

B.C.A. Part–II

Semester– III Part- II
Object Oriented Programming with C++ - (DSC-V-DSC04COM31)
Theory: 30 Teaching Hours Credits - 2

Course Outcomes- At the end of this course student will be able to:

CO1. Understand the features of C++ supporting object oriented programming.

CO2. Understand the relative merits of C++ as an object oriented programminglanguage.

CO3. Understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance andpolymorphism.

CO4. Understand advanced features of C++ specifically stream I/O and file handling.

Unit	Contents	Hours Allotted
I	**Principles of Objective Oriented Programming** History of OOP, Introduction to Object Oriented Programming, Basic Concepts of Object Oriented Programming, Benefits of Object Oriented Programming, Object Oriented Languages, Difference between C and C++. **Beginning with C++** Tokens, Keywords, Identifiers and Constants, Data Types, Type Compatibility, Variables, Operators in C++, Operator Precedence, Control Structures (Conditional, Unconditional and Looping).	07
II	**Functions in C++, Classes & Objects** Concept of Function, main() Function, Inline Functions, Function Overloading, Specifying a Class, Data members and Member Functions, Access Specifiers, Friend Function, Static data Member, Object declaration and Initialization, Arrays of Objects **Constructors & Destructors, Inheritance** Constructors-Definition, Use of Constructors, Types of Constructors (Default, Parameterized, Copy, Dynamic), Destructors-Definition, Use, Inheritance-Definition, Types of Inheritance (Single, Multiple, Multilevel, Hierarchical, Hybrid)	08
III	**Pointers, Virtual Functions &Polymorphism** Pointer, Pointer to Object, this pointer, Pointer to Derived Classes, Polymorphism: Meaning, compile Time and Run time polymorphism, Rules for Operator Overloading, Operator Overloading (Unary & Binary)-with member function and friend function.	07

	Working with Files	
IV	File-Definition, Use, Classes for File Stream Operations, Opening and Closing a File, File Opening Modes, File Pointers, Manipulation of File Pointer(using-seekg,seekp,tellg,tellp), Input Output Operations- get ( )Put ( ), read ( ) Write ( ).	**08**

Reference Books:-
1. Object Oriented Programming using C++ books By Yashwant Kanetkar
2. Object Oriented Programming with C++ by E Balagurusami.
3. Object Oriented Programming in C++ by Rajesh K Shukla
4. The C++ Programming Language written by BjarneStroustrup.
5. Object Oriented Programming in C++ by Robert Lafore
6. Test Your Skills in Object Oriented Programming with C++ by R S Salaria

B.C.A Part – II
Semester –III
Database Management System – (DSC-VI-DSC04COM32)
Theory: 30 Teaching Hours Credits – 2

Course Outcomes: At the end of this course students will be able to:
CO1. To Know the Fundamentals of Databases.
CO2. To understand how to use Databases in day to day
Applications. CO3. Design ER Models to represent simple database
application scenariosCO4. Improve the database design by
normalization.

Units	Content	Hours allocated

1	**Introduction of Database**
	1.1 Introduction
	1.2 Definition of DBMS
	1.3 file processing system Vs DBMS
	   1.3.1 Limitation of file processing system
	   1.3.2 Comparison of File processing system and DBMS
	1.4 Advantages and Disadvantages of DBMS
	1.5 Users of DBMS
	     1.5.1 Database Designers
	     1.5.2 Application programmer
	     1.5.3 Sophisticated Users
	     1.5.4 End Users
	1.6 Capabilities of good DBMS
	1.7 Types of Database System:
	     1.7.1 Centralized database system
	     1.7.2 client-server system
	1.7.3 Distributed database system.
		07

2	**Organization of Database System**
	2.1 Introduction
	2.2. Logical and Physical Files
	  2.2.1 Logical and Physical Files Definitions
	  2.2.2 File Structure
	2.3 Basic File Operations
	     2.3.1 Opening Files
	     2.3.2 Closing Files
	     2.3.3 Reading and Writing
	     2.3.4 Seeking
	2.4 File Organization
	     2.4.1 Field and Record structure in file
	     2.4.2 Record Types
	2.5 Types of file organization
	2.5.1 Files of Unordered Records (Heap Files)
	2.5.2 File of Ordered Records (Sorted Files)
	2.5.3 Hash Files
	2.5.4 Indexed file
		08

3	**Data Models**	07

	3.1 Introduction
	3.2 Data Models
	      3.2.1 Object Based Logical Model
	      3.2.2 Record Base Logical Model
	        a. Relational Model
	        b. Network Model
	        c. Hierarchical Model
	 3.3 Entity Relationship Model
	     3.3.1 Entity Set
	     3.3.2 Attribute
	     3.3.3 Relationship Set
	3.4 E-R Model terms Introduction
	      a. Relation b. Tuple c. Attribute d. Cardinality
	           e. Degree f. Domain
	 3.5 Keys- 3.5.1 Super Key, 3.5.2 Candidate Key, 3.5.3 Primary Key
	               3.5.4 Foreign Key
	3.6. Relational Database Design
	     3.6.1 Introducti
	     on
	     3.6.2Normaliza
	     tion
	           3.6.3 Normal Form
	        3.6.1. 1 NF, 3.6.2 2 NF, 3.6.3 3 NF	

4	**Relational algebra**	08

	4.1 Introduction
	4.2 Operations- a. Select, b. Project, c. Union, d. Difference,e.Intersection, f. Cartesian Product, g. Natural Join
	4.3. SQL (Structured Query Language)
	     4.3.1 Introduction
	     4.3.2 History of SQL
	     4.3.3 Basic Structure
	     4.3.4 DDL Commands
	     4.3.5 DML Commands
	     4.3.6 Simple Queries
	     4.3.7 Nested Queries
	     4.3.8 Aggregate Functions
	      4.3.9 Clauses	

References:

1 Database System Concepts By Henry korth and A. Silberschatz
2. An Introduction to Database System by Bipin Desai
3. File Structure by Michael J. Folk, Greg, Riccardi
4. Teach Yourself SQL in 14 days by Jeff Parkins and Bryan Morgan
5. Database Management System by Raghu Ramakrishn.

B.C.A Part – II
Semester –III
Syllabus According to NEP w.e.f. July 2024-2025

Course Code: MIN04MGT31	Course Name: Fundamentals of Entrepreneurship	Credits: 02	Marks : 50
Course Objective	• To define the concept of Entrepreneur. • To classify the types of entrepreneurs. • To know the concept of entrepreneurship. • To know the recent trends of entrepreneurship development.		
Course Outcomes	After completion of this course students will be able to – • To know the concept of entrepreneur. • To understand the functions of entrepreneur. • To know the importance of entrepreneurship. • To know the institutional support for entrepreneurship development. & recent trends in entrepreneurship		
Module	**Description**		
I	**Entrepreneur:** Concept, Classification, Functions of entrepreneur, Qualities of successful Entrepreneur, Types of Entrepreneur.		
II	**Entrepreneurship:** **A)** Concept, objectives, process, Importance of Entrepreneurship. **B)** Entrepreneurship development and recent trends: Start up, Stand up, Skill India, Make in India, Institute support for Entrepreneurship Development – National Institute for Entrepreneurship and Small Business Development (NIESBUD), Small Industry Development Bank of India (SIDBI), District Industry Centre (DIC)		

Learning Resources :

	Books Recommended: 1. Fundamentals of entrepreneurship **:** Dr. Amit Kumar. 2. Fundamentals of entrepreneurship **:** Dr. Asmita Dubey 3 Entrepreneur **:** Kevin. D.Johnson. 4. The Entrepreneur **:** Oumar Soule 5. The daily entrepreneur **:** S.J.Scott

B.C. A. Part – II (Semester III)
Syllabus According to NEP w.e.f. July 2024-2025

Course Code: MIN04MGT32	Course Name: Principles of Marketing	Credits: 02	Marks : 50
Course Objective	• To understand the core concepts of marketing. • To know the features of marketing. • To understand the significance of marketing. • To learn about the elements of marketing mix.		
Course Outcomes	After completion of this course students will be able to - • Understand the marketing concepts and its significance. • Understand the challenges & opportunities of marketing. • Evaluate 7P's of marketing, • Classify the elements of Marketing Mix,.		
Module	**Descriptions**		
I	**Introduction:** Meaning & Definition of Marketing, Features of marketing, Significance of marketing, Core concepts of Marketing - Need, Want, Demand, Value, Satisfaction, Exchange, Transaction & relationship, Marketing in 21st century – Challenges and opportunities.		
II	**Marketing mix:** Meaning, Definition, Elements of marketing mix – Product, Price, Place, Promotion, People, Process & Physical evidence.		

Learning Resources :

	Books Recommended: 1. Principles of Marketing – Philip Kotler. 2. Principles and Practice of Marketing – Dr. Amit Kumar. 3. Principles of Marketing – Pooja Jain, Dr. Neha Singhal. 4. Principles of Marketing – Dr. Mitthal and Dr. Agarwal. 5. Principles of Marketing – C.B. Gupta.

BCA II Part – II
Semester – III Part –II
PHP- II(SEC-II-SEC04CMO31)
Theory: 50 Teaching Hours Credits -2

Course Outcomes- At the end of this course student will be able to:
CO1: Understand the basics of PHP programming language and its role in web development
C02: Implement functions and arrays in PHP to solve programming problems
CO3: Design web forms using HTML and process user input using PHP.
CO4: Execute file uploads and perform file handling operations in PHP applications.

Unit	Content	Hours Alloted
1	**Working with Forms and User Input:** HTML forms and form elements, Retrieving user input with $_GET and $_POST, Form validation and sanitization, Handling file uploads **Working with Database-MySQL:** Introduction to databases and MySQL, Connecting to a MySQL database, SQL queries: SELECT, INSERT, UPDATE, DELETE, Prepared statements and preventing SQL injection, Retrieving and displaying data from a database	15
2	**Session Management and Cookies:** Understanding sessions and cookies, Creating and destroying sessions, Storing session data, Managing user authentication and authorization **File Handling and Directory Operations:** Working with files and directories, Reading from and writing to files, File uploads and file permissions, File and directory manipulation functions	15

References:
1. "PHP and MySQL Web Development" by Luke Welling and Laura Thomson
2. "Learning PHP, MySQL & JavaScript" by Robin Nixon
3. "Programming PHP" by RasmusLerdorf, Kevin Tatroe

BCA II Part – II
Semester – III Part –II
AI- I (SEC-IV-SEC04-CMO33)
Theory: 50 Teaching Hours Credits -2

Course Outcomes- Upon successful completion of this course, the students will be able to:

CO1. Identify AI problems and their features.

CO2. Use predicate calculus and propositional logic for knowledge representation.

CO3. Describe the statistical data numerically by using correlation, regression and curve fittings.

CO4. Use heuristics in search based problems.Use semantic networks, conceptual dependencies scripts and frames for information representation

Unit	Content	Hours Alloted
1	**AI- Its Root and Scope** Early history and applications,Attitude towards intelligence, knowledge and human artifices, Overview of AI application areas,AI- A summary	15
2	**Representation and Search** The proportional calculus, The predicate calculus, Using inference rules to produce predicate calculus expression, Graph theory, Strategies for state space search, Introduction to heuristic search, Hill climbing and dynamic programming, Best first search algorithm, Using heuristics in games	15

References:

1 Artificial Intelligence; structures and strategies for complex problem Solving by Gorge F Luger

2. Artificial Intelligence: A guide to intelligent systems by Michael Negnevistsky

3. Getting started with TensorFlow by Giancarlo Zaccone.

B.C.A. Part–II
Semester– IV Part-II
Lab Course Based On Object Oriented Programming with C++(DSC-PR-V DSC04PRA39)
Credits - 2

Course Outcomes- At the end of this course student will be able to:

CO1. Implement object oriented programming concepts using C++ Language.CO2. Apply the principles of virtual functions and polymorphism.
CO3. Analyzing and handling files using C++.
CO4. Implement concept of Function Overloading and Operator Overloading.

Sr.No.	Title Of Experiments
1.	WAP to understand the structure of C++ program
2.	WAP Simple Program using Class and Object.
3.	WAP to find greatest number among the given three numbers using class.
4.	WAP to find mean of data members of two classes using friend function.
5.	WAP to demonstrate Static data member.
6.	WAP to demonstrate Array of Object.
7.	WAP using Constructor (with and without Parameter).
8.	WAP using Destructor.
9.	WAP to demonstrate Types of Inheritance.
10.	WAP using Virtual Function.
11.	WAP to Overload Unary and Binary Operators with member function and friendfunction.
12.	WAP to Overload Binary Operator with member function and friend function.
13.	WAP for file handing- Opening file using Constructor.
14.	WAP for file handing- Opening file using open( ) method.
15.	WAP for working with multiple files.

Course Outcomes: At the end of this course students will be able to:
CO1. Understand the basic working of internet and its main services.
CO2. Create web pages using HTML & Applying CSS Styles in web page
development.CO3. To understand how to use Databases in day to day
Applications.
CO4. Design ER Models to represent simple database application scenarios

Sr. No.	Title of the Experiment
1	Create tables for the information given below by giving appropriate integrity constraints as specified.
2	Create table for the information given below by choosing appropriate data types and integrity constraints as specified.
3	1. Create the following tables (primary keys are underlined.). Property(pno,description, area) Owner(oname,address,phone) An owner can have one or more properties, but a property belongs to exactly oneowner . Create the relations accordingly, so that the relationship is handled properly and the relations are in normalized form (3NF). a) Insert two records into owner table. b) insert 2 property records for each owner . c) Update phone no of "Mr. Nene" to 9890278008 d) Delete all properties from "pune" owned by " Mr. Joshi"
4	To understand & get a Hands-on on Select statement
5	To understand & get a Hands-on on using set operations (union ,intersect and except) with select statement.

6	Create the following relations, for an investment firm emp(emp-id ,emp-name, address, bdate) Investor(inv-name , inv-no, inv-date, inv-amt) An employee may invest in one or more investments; hence he can be an investor.But an investor need not be an employee of the firm. Create the Relations accordingly, so that the relationship is handled properly andthe relations are in normalized form (3NF). Assume appropriate data types for the attributes. Add any new attributes, as required by the queries. Insert sufficient number of records in the relations / tables with appropriate values as suggested by some of the queries. Write the following queries & execute them. 1. List the distinct names of customers who are either employees, or investors orboth. 2. List the names of customers who are either employees, or investors or both. 3. List the names of employees who are also investors. 4. List the names of employees who are not investors.
7	To understand & get a Hands-on on nested queries & subqueries, that involvesjoining of tables.
8	To understand & get a Hands-on on nested queries & subqueries, that involves joining of tables, to demonstrate set cardinality.
9	Assignment related to small case studies (Each case study will involve creating tables with specified constraints, inserting records to it & writing queries for extracting records fromthese tables)
10	Assignment related to small case studies (Each case study will involve creating tables with specified constraints, inserting records to it & writing queries for extracting records fromthese tables)

Note: All practical's are done through My SQL

B.C.A. Part–II

Semester– IV Part- II
Data Structure Using C++ (DSC-VII DSC04COM41)
Theory: 40 Teaching Hours Credits – 2

Course Outcomes:- At the end of this practical paper students will be able to:

CO1:Use and implement appropriate data structure for the required problems using aprogramming language such as C++.
CO2:Write programs for various searching & sorting techniques.CO3:Implementing various data structures viz. Stacks, Queues. CO4:Implementation of Linked Lists and Trees.

Units	Modules	Hours Alloted
I	**Introduction to data structures** Introduction to Array, Introduction to Data Structures, Concept of Abstract Datatypes, Array as ADT,Data structures and its types,Data structures operations	5
II	**Searching and Sorting and Methods** Introduction to Searching and Sorting, Searching: Linear search, Binary searchand hashing, Sorting: Bubble Sort,Insertion sort, Selection sort, Merge sort,	5
III	**Stacks and Queues** Introduction to stack, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack in C++, Application of stack: Prefix and PostfixExpressions Evaluation, Definition of queue, Operations on queue, Types of queue- Linear, Circular, Applications of queue	10
IV	**Linked Lists and Trees** Introduction to Pointer,Introduction to linked lists, Implementation of Linked list, Types of Linked List: Singly, Doubly and Circular, Operations on linear linked list: Traversal, Insertion, Deletion, Searching Trees : definition, terminologies, representation, types, Tree Traversal- (Preorder, Inorder, Postorder)	10

Reference Books:
1. Data Structure Using C++ by YashavantKanetkar
2. Classic Data Structures-D. Samanta, Prentice Hall India Pvt. Ltd.
3. Data Structures using C and C++-YedidyahLangsam, Moshe J. Augenstein, Aaron M.Tenenbaum, Pearson Education
4. Data Structures: A Pseudo code approach with C, Richard Gilberg ,Behrouz A. Forouzan,Cengage Learning
5. Data Structures Using C & C++ by Rajesh K. Shukla, Wiley india

Pvt. LtdAlgorithms and Data Structures, Niklaus Wirth, Pearson Education

B.C.A.Part–II
Semester–IV Part- II
RDBMS - (DSC-VIII DSC04COM42)
Theory: 40 Teaching Hours Credits – 2

Course Outcomes- At the end of this course students will be able to:

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.

Units	Contents	Hours Allotted
I	**Relational Database Management System:** 1.1 Concept of RDBMS, Difference between DBMS andRDBMS, 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.	5
II	**INTRODUCTION TO SQL:** 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, ConversionFunctions, Date function, Aggregate functions, String functions.	10

III	**JOIN AND SUB QUERIES:** 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.	**5**
	3.3 Correlated queries, Indexes, Sequences. Views-Create View, Drop, View and its Advantages. , Denial of service (DoS), Firewall and proxy server.	
IV	**INTRODUCTION TO PL/SQL:** 4.1 Introduction to PL/SQL, Block Structure 4.2 Data types in PL-SQL 4.3 Control Structures-Branching statements, Iterative Control statements. 4.4 Cursors –Concept, Types- Implicit, Explicit, Procedure tocreate explicit cursors, Cursor Attributes. 4.5 TRIGGERS: Concept and types.	**10**

Reference Books:-

1) SQL, PL/SQL: The Programming Language- Ivan Bayross- (BPB)
2) Structured Query Language- by Osbome
3) SQL by Scott Ullman.
4) SQL & PL/SQL Black Book for Oracle by Dr,P.S.Deshpande.

B. C. A. Part – II (Semester IV)
Syllabus According to NEP w.e.f. July 2024-2025

Semester	**IV**	Total credit	2	
Course code	Core Course – MIN04MGT41	Credit pattern	Marks - 50	
Course title	**Management Information System**			

Course objectives	
1	Describe the use and function of information systems.
2	Describe and evaluate information systems development processes and techniques.
3	Identify and evaluate hardware and software requirements for information systems.
4	Explain the security risks associated with management information systems.

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:

CO 1: Understand the fundamental principles of information systems

CO 2: Describe the types of management and decision making

CO 3: Demonstrate different types of IS used in business.

CO 4: Explain various applications of MIS

Module	**Content**	
I	Introduction to Information System	
	Introduction to systems- definition, need, types, characteristic	
	Definition of Information Classification of Information	
	Need and importance of information system	
	Definition and Characteristics of information system	
	Role of information system in business	
II	Types of Information System Introduction	
	Operational and Knowledge Level- TPS (Transaction	
	Processing System), OAS (Office Automation System), KWS	
	(Knowledge Work System) Management and Strategic Level-	
	MIS (Management Information System-need characteristics,	
	DSS (Decision Support System)-need, characteristics, components,	
	ESS (Executive Support System)-need, characteristics	

Learning Recourses: Reference Books
1.W. S. Jawadekar,Management Information Systems, 4th edition, McGraw Hill.
2. Ramesh Behl , James O‟ Obrien and George M. Marakas, Management Information Systems, 10th edition, McGraw Hill edition.
3. DR. Milind M. Oka. , Management Information Systems , Everest Publishing House

B. C. A. Part – II (Semester IV)
Minor
Syllabus According to NEP w.e.f. July 2024-2025

Semester	**IV**		Total credit	2	
Course code	Core Course –**MIN04MGT42**		Total Marks	50	
Course title	**M-Commerce**				

Course objectives	
1	To facilitate objective solution in business decision making under subjective conditions.
2	Enables a business to reach more customers online
3	To provides customers with wide range of product choices and payment options from different vendors
4	Innovation and utilization of resources.

COURSE OUTCOMES: At the end of this course it is expected that the students will be able:
CO 1: Ability to forecast demand in light of changing circumstances and to formulate business plan.
CO 2.: Ability to chalk out Business Policies
CO 3: Knowledge about the various sources of finance available to businessmen these days.
CO 4: Understanding of the different techniques of risk management.

Module	**Content**	
I	**E-Commerce** Introduction, meaning and definition of E-Commerce, Brief history of ECommerce, Need of Ecommerce, Advantages and limitations of e-commerce, Role of ecommerce in industries, Requirements of E-Commerce, Scope of E – Commerce, , E-commerce Models(B2B,B2C,C2B,C2C,B2G,G2B)	
II	**Mobile Commerce** Introduction, scope of mobile—commerce, applications of m-commerce, . Principles of mobile commerce, benefits of mobile commerce, limitations of mobile commerce, E-commerce vs. M-commerceReal time examples of IoT, Advantages of IoT, Challenges of IoT.	

Learning Recourses: Reference Books
1. P. J. Louis, "M-Commerce Crash Course", McGraw- Hill Companies February 2001. 2. Paul May, "Mobile Commerce: Opportunities, Applications, and Technologies Of Wireless Business" Cambridge University Press March 2001. 3. Gary Schneider, Electronic Commerce, Thomson Publishing. ISBN-10: 1-4239-0305-6 4. Pandey, Srivastava and Shukla, E-Commerce and its Application, S. Chand 5. P.T. Joseph, Electronic Commerce – An Indian Perspective, P.H.I Bharat Bhaskar, Electronic Commerce, TMH

B.C.A. Part–II
Semester – III Part- II
Software Engineering –III (SEC-III-SEC04COM32)
Theory: 50   Teaching Hours Credits – 2

Course Outcomes- At the end of this course students will be able to:

CO1. Compare and chose a process model for a software project development.
CO2. Identify requirements analyze and prepare models.
CO3. Prepare the SRS, Design document, Project plan of a given
softwaresystem.
CO4. Work as an individual and as part of a multidisciplinary team to
developand deliver quality software.

Units	Contents	Hours Allotted
I	**Introduction:** Software Engineering approach, Need of engineering aspect for Software Design, SDLC, Software Crisis, Software Process, Process models (Classical Waterfall Model, Build-n- Fix Model, Iterative Waterfall Model, PrototypingModel, Evolutionary Model and Spiral Model)	05
II	**Software Requirement Analysis and Specifications:** Software Requirement Specifications, Need of SRS, Steps for constructinggood SRS, Behavioral and Non-Behavioral requirements, Analysis Model	5
III	**Software Design:** Design Concepts & Principle, problem partitioning, abstraction, and top down and bottom up-design, Cohesion & Coupling, How to measure degree of Cohesion andCoupling, Function Oriented Design, DFDs, Structure Chart, Object Oriented Design.	10
IV	**Software Testing:** Validation and Verification, Black Box testingapproach, White Box testing approach, Levels of testing: Unit Testing, Integration Testing, Validation testing, System testing and debugging. Software Maintenance: Software Maintenance Process and its types.	10

Reference Books :-

1. Ian Sommerville. Software Engineering, Pearson Education (Addison Wesley).

2. P. Jalote, "An Integrated approach to Software Engineering", Narosa, 1991.

3. Waman S. Jawadekar,"Software Engineering: Principles and Practice", McGraw Hill.

4. R. S. Pressman, "Software Engineering – A practitioner's approach", 3rd ed., McGraw Hill Int.Ed., 1992.

5. K.K.Agrawal&Yogesh Singh, "Software Engineering", New Age Publicatio

BCA II Part – II
Semester – IV Part –II
AI-II - (SEC-V SEC04CMO41)

Theory: 50 Teaching Hours Credits -2

Course Outcomes- Upon successful completion of this course, the students will be able to:
CO1. Identify AI problems and their features.
CO2. Use predicate calculus and propositional logic for knowledge representation.
CO3. Describe the statistical data numerically by using correlation, regression and curve fittings.
CO4. Use heuristics in search based problems. Use semantic networks, conceptual dependencies scripts and frames for information representation

Unit	Content	Hours Alloted
1	**Representation and intelligence** Issues in knowledge representation, Brief history of AI representational schemes, Introduction to conceptual graphs, Type, individuals and names, Generalization & specialization. **Rule based expert system** Introduction, K rules as knowledge, representation, schemes, Expert system development teams, Structure, Characteristics, Forward chaining and backward chaining inference techniques., Media Advisor: A Demonstration, Conflict resolution, Advantages and disadvantages	15
2	**Uncertainty management in rule based expert system** Introduction, Basic probability theory, Bayesian reasoning, Forecast, Certainty factors theory and evidential reasoning, Comparison of Bayesian reasoning and certainty factors. **TensorFlow- Basic Concept** Machine learning and deep learning concepts, TensorFlow- general overview, Installing TensorFlow, first working session, Data Flow graph, TensorFlow Programming model, How to use TensorBoard.	15

References:
1 Getting started with TensorFlow by Giancarlo Zaccone.
2. Artificial Intelligence: A guide to intelligent systems by Michael Negnevistsky.
3. Introduction to Artificial Intelligence by Dan W. Patterson.

B.C.A. Part–II
Semester– IV Part-II
Lab Course based Data Structure using C++ (DSC-PR-VII DSC04PRA49)
Credits – 4

Course Outcomes:- At the end of this practical paper students will be able to:

CO1: Choose appropriate data structure to represent data items in real
world.CO2: Design programs using data structures like stack, queues,
binary tree.
CO3: Develop programs of searching and sorting.
CO4: Develop programs using static and dynamic implementation.

	List of Experiments:
1.	Write a program to implement stack using static method.
2.	Programs to implement applications of stack.
3.	Write a program to implement Queue using static method.
4.	Programs to implement applications of queue.
5.	Write a program to create linked list, add node to linked list and Remove node fromlinked list.
6.	Write a program to implement types of linked list.
7.	Write a program to implement stack and queue dynamically.
8.	Write a program to sort given elements using bubble sort, insertion sort, and selection sort
9.	Write a program to search given element using Linear Search.
10.	Write a program to search given element using Binary Search.

B.C.A. Part–II
Semester– IV Part-II
Lab Course based on RDBMS - (DSC-PR-VIII DSC04PRB49)
Credits-2

Course Outcomes- At the end of this course student will be able to:

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. Apply advanced SQL features like views, indexes, synonyms, etc. for database management.CO4. Analyze PL/SQL structures using PL/SQL block: functions, procedures, cursors and triggers for database applications.

Sr. No.	Title Of The Experiment
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.

Semester– IV Part-II
Mini Project
Credits – 2

Course Outcomes:- At the end of this practical paper students will be able

to: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 analyze the modules of planned 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 do project in any language studied in 5th or earlier Semesters. The mini Project will be evaluated by the external examiners appointed by University.

Question Paper Pattern

Duration: 2 Hours

Total Marks –40

Instructions: 1) Q.1 & Q.8 is compulsory.
                        2) Attempts any four Questions from Que. No.3 to Que. No.7.
                         3) Figures to the right indicate full marks.

Que. No.	Type of question	Marks
1	MCQ	5
2	Fill in the Blanks/True or False	3
3	Long answer question	8
4	Long answer question	8
5	Long answer question	8
6	Short notes on (Any two out of five)	4