

“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 BOTANY
Three/Four- Years UG Programme
Department/Subject Specific Core or Major (DSC)

NEP- Phase-II

**Curriculum, Teaching and
Evaluation Structure**

(as per NEP-2020 Guidelines)

for

**B.Sc.-I Botany
Semester-I & II**

(Implemented from academic year 2024-25 onwards)



Department of Botany

B.Sc.: Program Outcomes (POs):

PO1: Disciplinary Knowledge: Graduates will gain in-depth understanding in their specific major or discipline, mastering the foundational principles and theories, as well as advanced concepts. Execute strong theoretical and practical understanding developed from the specific programme in the area of work.

PO2: Problem-Solving Skills: Graduates will learn to use their knowledge to identify, analyze, and solve problems related to their field of study.

PO3: Analytical Skills: Graduates will gain the ability to collect, analyze, interpret, and apply data in a variety of contexts. They might also learn to use specialized software or equipment.

PO4: Research Skills and Scientific temper: Depending on the field, graduates might learn how to design and conduct experiments or studies, analyze results, and draw conclusions. They might also learn to review and understand academic literature.

PO5: Communication Skills: Many programs emphasize the ability to communicate effectively, both orally and in writing. Graduates may learn to present complex information clearly and succinctly, write detailed reports, and collaborate effectively with others.

PO6: Ethics and Professionalism: Graduates may learn about the ethical and professional standards in their field, and how to apply them in real-world situations.

B.Sc. in Botany: Program Specific Outcomes (PSOs):

PSO1: The aims of this programme is to enable the student to reach current understanding of botany and practical skills in an expanding field of employment.

PSO2: Identify problems and independently propose solutions using creative approaches, acquired through interdisciplinary experiences, and a depth of knowledge/expertise in the field of Plant Identification.

PSO3: Students will be able to access the literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.



Vivekanand College, Kolhapur (Empowered Autonomous)**Department of Botany****NEP- Phase-II****Departmental Teaching and Evaluation scheme
(2024-25 onwards)****Three/Four- Years UG Programme****Department/Subject Specific Core or Major (DSC)****(as per NEP-2020 Guidelines)****First Year Semester-I & II**

| Sr. No. | Course Abbr. | Course code | Course Name | Teaching Scheme | | Examination Scheme and Marks | | | | Course Credits |
|---------------------------|---------------|-------------|--|-----------------|-----------|------------------------------|-----------|-----------|--------------|----------------|
| | | | | TH | PR | ESE | CIE | PR | Marks | |
| Semester-I | | | | | | | | | | |
| 1 | DSC-I | 2DSC03BOT11 | Basic in Botany | 2 | - | 40 | 10 | - | 50 | 2 |
| 2 | DSC-II | 2DSC03BOT12 | Plant Morphology | 2 | - | 40 | 10 | - | 50 | 2 |
| 3. | IKS-I | 2IKS03GEC11 | Indian Knowledge System | 0.5 | - | 12.5 | - | - | 12.5 | 0.5 |
| 4. | DSC BOT-PR-I | 2DSC03BOT19 | DSC Botany Lab-1 | - | 4 | - | - | 25 | 25 | 2 |
| 5. | OEC LFS-PR-I | 2OEC03LFS11 | Life Science - I (Herbal Cosmetics - I) | - | 4 | - | - | 25 | 25 | 2 |
| Semester –I Total | | | | 4.5 | 08 | 92.5 | 20 | 50 | 162.5 | 8.5 |
| Semester-II | | | | | | | | | | |
| 1 | DSC -III | 2DSC03BOT21 | Reproductive Botany | 2 | - | 40 | 10 | - | 50 | 2 |
| 2 | DSC -IV | 2DSC03BOT22 | Diversity and conservation of Plants | 2 | - | 40 | 10 | - | 50 | 2 |
| 3 | DSC BOT-PR-II | 2DSC03BOT29 | DSC Botany Lab-2 | - | 4 | - | - | 25 | 25 | 2 |
| 4 | OEC LFS-PR-II | 2OEC03LFS21 | Life Science - II (Herbal Cosmetics - II) | - | 4 | - | - | 25 | 25 | 2 |
| Semester –II Total | | | | 04 | 08 | 80 | 20 | 50 | 150 | 08 |

Abbreviations: TH-Theory, PR-Practical, PRO- Project, SEE- Semester End Examination,

CIE- Continuous Internal Examination

Note: Minimum passing for 10 marks Internal evaluation = 04 marks

Minimum passing for 40 marks Theory paper = 16 marks

Minimum passing for 25 marks Practical = 10 marks

Passing percentage for Democracy, Election and Good Governance (DEGG) and Environmental Studies papers should be 40%

Separate passing for each Head - ESE, CIE and Practicals



Semester -I



B. Sc. Part – I Semester -I BOTANY

DSC-I: 2DSC03BOT11: Basic in Botany

Credits: 02

Theory: 30 hrs.

Marks-50

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

CO1: Develop basic skills to study botany in details.

CO2: Understand unique and general features of algae, fungi, bryophytes, pteridophytes and gymnosperm.

CO3: Understand the diversity of plants with respect to algae, fungi, bryophytes, pteridophytes and gymnosperm.

CO4: Acquaint the knowledge regarding importance of plants.

Unit -1: Importance of Plant: (4 Lectures.)

Role of plants in human welfare (Direct and indirect), Role of plants in ecological services.

Evolutionary history of plants.

Unit -2: General outline of Plant Kingdom: (10 Lectures.)

Study of characters of plant kingdom, Study of classification of plant kingdom.

Study of five divisions with respect to characters and economic importance.

Unit -3: Study of following examples with reference to occurrence , plant body and life cycle:

(10 Lectures.)

Study of Algae : *Nostoc* , Study of Fungi : *Mucor.* , Study of Bryophyte : Moss.

Study of Pteridophyte : *Pteris.*, Study of Gymnosperm : *Cycas.*

Unit-4: Organization of higher plant body: (6 Lectures.)

Plant organs (Root, Stem and Leaf), Development of plant body (seedling development).

Internal organization, Study of tissue systems – Meristematic tissue and Simple and Complex.

Reference Books:

- Sharma O. P. Textbook of Thallophytes , McGraw Hill, Publishing Co. New Delhi. (1992)
- Smith G. M. , Cryptogamic Botany Vol. II. Bryophytes and Pteridophytes, Tata McGraw Hill, Publishing New Delhi. (1971)
- Pandey B. P., College Botany Vol. I , S. Chand and Company Ltd. New Delhi. (2010)
- Gangulee and Kar, College Botany Vol. II, New Central Book Agency (P) Limited, Kolkata.(1998)



B. Sc. Part – I Semester -I BOTANY

DSC-II: 2DSC03BOT12: Plant Morphology

Credits: 02

Theory: 30 hrs.

Marks-50

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

CO1: Understand general organization of plant body.

CO2: Acquire basic knowledge required for understanding plant functioning.

CO3: Get and insight into be the fruit and seed development.

CO4: Understand the morphology and development of different plant parts.

Unit-1:General organization of plant body: (12 Lectures.)

Root system – Introduction, types and modification of root with one example.

Shoot system - Introduction and modification of stem with one example.

Leaf – Introduction, Types- Simple and Complex, Phyllotaxy, Leaf venation, Modification with one example.

Unit-2: Study of Inflorescence: (4 Lectures)

Definition and characters, types of inflorescence and significance of inflorescence.

Unit- 3: Study of Flower: (10 Lectures)

Definition and parts of a typical flower, Symmetry, Insertion of floral whorls-

Hypogynous, Perigynous and Epigynous., Calyx and Corolla – forms, aestivation.

Perianth- types., Androecium- parts and types.

Gynoecium- parts, arrangement and types of placentation.

Unit-4: Study of Fruit: (4 Lectures)

Introduction and types with one example each.

Reference books:

- Saxena N. B. and Saxena S., Plant Taxonomy, Pragati Publication, Pune. (2012)
- Sharma O. P., Plant Taxonomy, Tata McGraw Hill, Publishing New Delhi. (2013)
- P.H. Davis and V.H. Haywood, Principles of Angiosperm Taxonomy., Oliver and Royd, London.(1963)
- Naik V. N., Taxonomy of Angiosperms., Tata McGraw Hill, New York. (1994).



B. Sc. Part – I Semester -I BOTANY

IKS: IKS03GEC11: Indian Knowledge System

Credits: 0.5

Theory: 10 hrs.

Marks- 12.5

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

CO1: Understand the importance of Ayurveda in everyday life.

CO2: Enable to advise the constitutional method of diet and Ayurveda life style.

CO3: Understand the source, chemical constituents and its uses of some medicinal plants.

CO4: Know the different system of medicine.

Unit-1: Introduction to Ayurveda.

(10 Lectures.)

1a. Ayurvedic medicinal system

1b. Principles of Ayurveda (Vata, Pitta, Kapha)

1c. Ayurvedic therapies

1d. Unani system of medicine

1e. Siddha system of medicine

1f. Future of herbal drugs

1g. Study of medicinal plants- Punarnava, Vasaka, Shatavar, Brahmi and Arjuna

Reference books:

- Textbook of Pharmacognosy (Second edition) , Dr. Mohammed Ali, CBS Publishers and distributors, New Delhi.
- A Text book on Research methodology and Medical Statistics in Ayurveda, Rashmi Pujar & Aswin Haridas, A house of oriental, Ayurvedic books, Varanasi.
- Ayurveda- The Science of Self Healing, Dr. Vasant Lad, A Practical Guide, Motilal Banarsidas Publishers, Pvt. Ltd, India.



B. Sc. Part – I Semester -I BOTANY

DSC BOT- PR-I : 2DSC03BOT29: DSC BOTANY LAB - 1

Credits: 02

Practical: 60hrs.

Marks-25

(Practical: Four lectures of 60 minutes per week per batch)

PRACTICAL – I

- 1) Study of Microscope and its parts.
- 2) Study of *Nostoc*.
- 3) Study of *Mucor*.
- 4) Study of Moss.
- 5) Study of *Pteris*.
- 6) Study of *Cycas*.
- 7) Study of *Hibiscus*.
- 8) Study of different types of tissue – Simple and Complex.
- 9) Study of types of seed –Dicot and Monocot.
- 10) Study of root and its modification.
- 11) Study of stem and its modification.
- 12) Study of leaf and its modification.
- 13) Study of inflorescence- Racemose, Cymose, Special and its types.
- 14) Study of typical flower.
- 15) Study of different types of fruit.



B. Sc. Part – I Semester -I BOTANY

OEC LFS- PR-I : 2OEC03LFS11: Life Science - I (Herbal Cosmetics - I)

Practical: Four lectures of 60 minutes per week per batch

Marks: 25 (Credits 02)

PRACTICAL – I

1 to 3) Study of cosmetics and skin care plant with reference to botanical name, family, source, botanical description and its uses.

Aloe vera, Neem, Turmeric, Chamomile, Coconut oil, Jajoba oil, Beet and Bixa.

4 to 5) Preparation cum demonstration of herbal creams.

6 to 7) Preparation cum demonstration of shampoo/ herbal shampoo.

8 to 9) Preparation cum demonstration of lotions.

10 to 11) Preparation cum demonstration of aloe vera gel.

12 to 13) Preparation cum demonstration of hair packs.

14 to 15) Preparation cum demonstration of hair oils.

16 to 17) Preparation cum demonstration of face packs/ creams.

18) Preparation cum demonstration of herbal lipsticks.



Semester -II



B. Sc. Part – I Semester -II BOTANY

DSC-III: 2DSC03BOT21: Reproductive Botany

Credits: 02

Theory: 30 hrs.

Marks-50

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

CO1: Understand reproduction of plants.

CO2: Impart basic knowledge of pollination and fertilization in plants.

CO3: Understand the development of reproductive parts.

CO4: Get and insight into be the fruit and seed development.

Unit-1: Study of Microsporogenesis: (8 Lectures.)

Study of microsporangium, Study of anther. (Structure and dehiscence),

Study of microsporogenesis, Study of pollen grain, Study of male gametophyte development.

Unit-2: Study of Megasporogenesis: (8 Lectures.)

Study of types of ovule, Study of megasporogenesis, Study of typical embryo sac.

Study of types of embryo sac : Monosporic (*Polygonum* type), Bisporic (*Alliumsp.*) and Tetrasporic (*Peperomia* type).

Unit-3 : Pollination and Fertilization: (7 Lectures.)

Introduction and definition, Types of pollination (self, cross and its sub types)

Agents of pollination , Double fertilization : Definition and mechanism.

Unit-4: Endosperm and Embryo: (7Lectures.)

Introduction, Development of endosperm, Types of endosperm, Embryogeny.

Structure of dicot and monocot embryo, Seed formation, Polyembryony.

Reference Books:

- Pandey B. P. A Textbook of Botany , Angiosperms, S. Chand Publications , New Delhi. (1998)
- Naik V. N., Taxonomy of Angiosperms., Tata McGraw Hill, New York. (1994)
- V. Raghavan., Embryogenesis in Angiosperms: A Development and Experimental Study, Cambridge University Press New York. USA. (1986)
- K.R Sporne, The Morphology of Angiosperms., B.I. Publication, Bombay.(1977)



B. Sc. Part – I Semester -II BOTANY

DSC-IV: 2DSC03BOT22: Diversity and Conservation of Plants

Credits: 02

Theory: 30 hrs.

Marks-50

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

CO1: Understand outline of different classification system.

CO2: Classify the groups and the different the taxonomic forms.

CO3: Generate interest among the students about plant conservation.

CO4: Make the student aware about the extent of the total biodiversity and the importance of their Conservation.

Unit-1: Study of classification systems: (12 Lectures)

Introduction and definition, Ranks of classification.

Study of five kingdom classification system (R. H. Whittaker).

Study of general characters of each kingdom.

Unit-2: Domains of Life: (3 Lectures)

Study of three domains of life – Archaea, Bacteria and Eukarya.

(Study of general character of each).

Unit-3: Plant Diversity: (7 Lectures)

Introduction and definition, Types of diversity, Importance of diversity.

Threats of diversity, Magnitude of diversity.

Unit-4: Conservation of Plant Diversity: (6 Lectures)

Introduction and definition, Types of conservation. (*In situ* / *Ex situ*)

Necessity of conservation.

Reference books:

- Sing V., Pande P. C. and Jian D. K. , A text book of Botany- Angiosperms (2007).
- Singh G. Plant Systematics, Theory and Practice, Oxford and IBH Pvt. Ltd., New Delhi. (2012)
- Jackson R. B., Biology, 8th Edition, San Francisco, California, Pearson Benjamin Cummings.(2012)
- V.H. Heywood, D.M. Moore, Current Concepts in Plant Taxonomy, Academic Press, London. (1984).



B. Sc. Part – I Semester -II BOTANY

DSC BOT- PR-II : 2DSC03BOT29: DSC BOTANY LAB - 2

Credits: 02

Practical: 60hrs.

Marks-25

(Practical: Four lectures of 60 minutes per week per batch)

PRACTICAL – II

- 1) Study of typical anther and its types.
- 2) Study of different types of ovule.
- 3) Study the structure of pollen grains.
- 4 to 5) Study of pollen viability and germination.
- 6) Study of seed germination.
- 7 to 8) Study of pollen morphology of the following plants – *Hibiscus*, *Vinca*, *Ixora* by microscopic observation.
- 9) Study of kingdom monera with suitable example.
- 10) Study of kingdom protista with suitable example.
- 11) Study of different types of Bacteria.
- 12 to 13) Assessment of diversity, abundance and frequency of plant species by quadrat method.
- 14) Study of typical dicot and monocot embryo.
- 15) Study of dicot and monocot endosperm.



B. Sc. Part – I Semester -II BOTANY

OEC LFS- PR-II : 2OEC3LFS21: Life Science - II (Herbal Cosmetics - II)

Credits: 02

Practical: 60hrs.

Marks-25

(Practical: Four lectures of 60 minutes per week per batch)

PRACTICAL – II

- 1 to 2) Preparation of mehndi.
- 3 to 4) Study of extraction and application of natural dyes.
- 5 to 6) Study of preparation of organic soaps.
- 7 to 8) Study of preparation of dhoop and agarbati.
- 9 to 10) Study of preparation of beverages.
- 11 to 12) DIY (Do It Yourself) - Best from Waste.
- 13) Study of preparation of wheat grass juice.
- 14 to 16) Study of preparation of ayurvedic juices.
- 17) Submission - Dhoop and Agarbati/ Organic soap/ Dye.



Question Paper Format:

| | |
|----------|--|
| Seat No. | |
|----------|--|

| | |
|------------------|--|
| Ques. paper code | |
|------------------|--|

**VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)**

B.Sc. Part- I (Botany) (Semester-I) Examination.....

Course Code and Name: 2DSC03BOT11: Basic in Botany

Day:

Time: 2 hours

Date: --/--/----

Marks : 40

Instructions:

- 1) All the questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Draw neat labeled diagrams wherever necessary.

Q. 1. Select correct alternative (One mark each):

[8]

- i) Xyzabcdefghijklmnop -----
a) ----- b) ----- c) ----- d) -----
- ii) Xyzabcdefghijklmnop -----
a) ----- b) ----- c) ----- d) -----
- iii) Xyzabcdefghijklmnop -----
a) ----- b) ----- c) ----- d) -----
- iv) Xyzabcdefghijklmnop -----
a) ----- b) ----- c) ----- d) -----
- v) Xyzabcdefghijklmnop -----
a) ----- b) ----- c) ----- d) -----
- vi) Xyzabcdefghijklmnop -----
a) ----- b) ----- c) ----- d) -----
- vii) Xyzabcdefghijklmnop -----
a) ----- b) ----- c) ----- d) -----
- viii) Xyzabcdefghijklmnop -----
a) ----- b) ----- c) ----- d) -----

Q.2. Attempt any TWO (Eight marks each):

[16]

- i) Xyzabcdefghijklmnop.
- ii) Xyzabcdefghijklmnop.
- iii) Xyzabcdefghijklmnop.



Q.3. Attempt any FOUR (Four marks each):

[16]

- i) Xyzabcdefg hijklmnop.
- ii) Xyzabcdefg hijklmnop.
- iii) Xyzabcdefg hijklmnop.
- iv) Xyzabcdefg hijklmnop.
- v) Xyzabcdefg hijklmnop.
- vi) Xyzabcdefg hijklmnop.

Equivalence of Courses:

B.Sc. Part I (Semester I and II)

| Semester | Old Course | | | Course in NEP Phase-II | | |
|----------|-----------------------|--|---------|------------------------|--------------------------------------|---------|
| | Course code | Course Name | Credits | Course code | Course Name | Credits |
| I | DSC-1007A1 | Biodiversity in Microbes, Algae and Fungi | 2 | 2DSC03BOT11 | Basic in Botany | 2 |
| | DSC-1007A2 | Bryophytes, Pteridophytes and Gymnosperms (Archegoniate) | 2 | 2DSC03BOT12 | Plant Morphology | 2 |
| II | DSC-1007B1 | Plant Ecology | 2 | 2DSC03BOT21 | Reproductive Botany | 2 |
| | DSC-1007B2 | Plant Taxonomy | 2 | 2DSC03BOT22 | Diversity and conservation of Plants | 2 |
| | DSC-1007A & DSC-1007B | Botany Lab(I) | 4 | 2DSC03BOT19 | DSC Botany Lab-1 | 2 |
| | | | | 2DSC03BOT29 | DSC Botany Lab-2 | 2 |

