

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



Shri Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE, KOLHAPUR
(AN EMPOWERED AUTONOMOUS INSTITUTE)

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

NEP- 3.0

**Curriculum, Teaching and
Evaluation Structure**

(as per NEP-2020 Guidelines)

for

B.Sc.-I Botany
Semester-I & II
(Implemented from academic year 2026-27 onwards)



Shri Swami Vivekanand Shikshan Sanstha's
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DEPARTMENT OF BOTANY

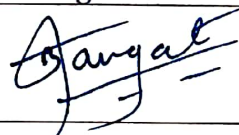
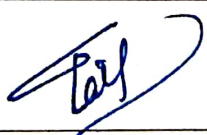
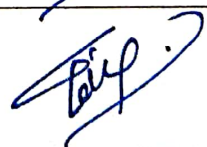
**Curriculum, Teaching and
Evaluation Structure**
(as per NEP-2020 Guidelines)

NEP- 3.0

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

(Implemented from academic year **2026-27** onwards)

Verified by

Sr. No.	Name	Designation	Signature
1	Dr. B. T. Dangat	BoS Chairman	
2	Prof. (Dr.) A. S. Kumbhar	Dean	
3	Prof. (Dr.) C. B. Patil	NEP Nodal Officer	
4	Prof. (Dr.) C. B. Patil	Principal	

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: Demonstrate comprehensive knowledge of plant diversity, taxonomy, morphology, anatomy, physiology, genetics, ecology, biotechnology, and evolution to understand the structure, function, and significance of plants.

PSO2: Apply scientific principles, laboratory techniques, field-based methods, and modern biological tools for plant identification, biodiversity assessment, experimental investigation, and data interpretation.

PSO3: Analyze biological problems using critical thinking, interdisciplinary knowledge, quantitative skills, and scientific literature to propose sustainable and evidence-based solutions.

PSO4: Promote conservation and sustainable utilization of plant resources by understanding environmental issues, biodiversity conservation strategies, climate change impacts, and ecological restoration practices.

PSO5: Develop professional competencies, ethical values, communication skills, entrepreneurship, and lifelong learning abilities for higher education, research, agriculture, biotechnology, environmental management, and allied life science careers.

Vivekanand College, Kolhapur
(An Empowered Autonomous Institute)

Department of Botany

NEP-3.0

Departmental Teaching and Evaluation scheme
(2026-27 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
				Hours/week		Theory		Practical		Total	
				TH	PR	SEE	CIE	SEE	CIE	Marks	
Semester-I											
1	DSC-I	3DSC03BOT11	Basic in Botany	2	-	30	20			50	2
2	DSC-II	3DSC03BOT12	Plant Morphology	2	-	30	20			50	2
3	IKS-I	3IKS03GEC11	Indian Knowledge System	2	-	30	20	-	-	50	2
4	DSCBOT-PR-I	3DSC03BOT19	DSC Botany Lab-1	-	4	-	-	30	20	50	2
5	OE BOT-PR-I	3OEC03LFS11	Life Science - I (Herbal Cosmetics - I)	-	4	-	-	30	20	50	2
Semester –I Total				6	8	90	60	60	40	250	10
Semester-II											
1	DSC -III	3DSC03BOT21	Reproductive Botany	2	-	30	20			50	2
2	DSC -IV	3DSC03BOT22	Diversity and conservation of Plants	2	-	30	20			50	2
3	DSC BOT-PR-II	3DSC03BOT29	DSC Botany Lab-2	-	4	-	-	30	20	50	2
4	OE BOT-PR-II	3OEC03LFS21	Life Science - II (Herbal Cosmetics - II)	-	4	-	-	30	20	50	2
Semester –II Total				4	8	60	40	60	40	200	8

Abbreviations: TH-Theory, PR-Practical, SEE- Semester End Examination,
CIE-Continuous Internal Examination

Note: Minimum passing for 20 marks Internal evaluation = 08 marks

Minimum passing for 30 marks Theory paper/Practical = 12 marks

Separate passing for each Head - SEE, CIE (Theory and Practicals)



Semester-I



B.Sc.Part–I Semester-I BOTANY

DSC-I: 3DSC03BOT11: Basic in Botany

Credits:02

Theory:30hrs.

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, McGrawHill, Publishing Co. New Delhi. (1992)
- Smith G. M., Cryptogamic Botany Vol. II. Bryophytes and Pteridophytes, Tata McGrawHill, 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: 3DSC03BOT12: 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 an insight into 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 McGrawHill, 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: 3IKS03GEC11: Indian Knowledge System

Credits: 2

Theory: 30hrs.

Marks- 50

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

- CO1: Explain the principles and practices of traditional Indian agricultural systems, including indigenous irrigation methods and seed preservation technique.
- CO2: Demonstrate and evaluate traditional agricultural practices that promote sustainable crop production, soil health and environmental conservation.
- CO3: Analyze indigenous ecological knowledge, including traditional weather forecasting and ecological indicators, for understanding climate and seasonal variations.
- CO4: Assess the significance of conservation strategies, community based forest Management and environmental ethics in achieving sustainable natural resource management.

Unit-1: Indian Knowledge Systems: History and Education Heritage (10Lectures.)

- a. Introduction: What is Indian Knowledge, Importance, Role of IKS in education.
- b. Introduction to the timeline of India: Prehistory (Paleolithic age, Mesolithic age, Neolithic age), Proto-history (Chalcolithic period Megalithic period), Historical period
- c. Introduction to Ancient Indian Education System: Commencement of education, Centre of education, Students life, Qualities of teacher, The learning of Vedas, Vocational education, Teaching-Learning process, Female education, Universities in Ancient Indian- Takshila, Nalanda, Valabhi, Vikramshila, Kanchi, Navadpida.

Unit-2: Indian Scientific Legacy (10Lectures.)

- Introduction: What is Indian Knowledge, Importance, Role of IKS in education.
- a. Overview of Indian Medicine – Ayurveda: History, Charaksanhita, Theory of Three Doshas, Modern Applications.
 - b. Overview of Indian Astronomy and Mathematics:
 1. Astronomy: Introduction, 27 Nakshatras, Astronomical instruments.
 2. Mathematics: Introduction, Algebra-Permutations, Combinations, Arithmetic
 - c. Overview of Ancient Indian Chemistry:

Chemistry: Pottery, Plastering technique, Cosmetics and perfumes, Fermentation, Colour pigments.

Unit-3: Traditional Agriculture

(04 Lectures.)

- a. Ancient Indian agricultural systems
- b. Indigenous irrigation methods
- c. Traditional seed preservation techniques
- d. Traditional agricultural and cultural practices

Unit-4: Conservation and Environmental Ethics

(06 Lectures.)

- a. *In situ* conservation
- b. *Ex situ* conservation
- c. Community forest management
- d. Indigenous ecological indicators
- e. Traditional weather forecasting

Reference books:

- *The Traditional Indian Agriculture*, C. Swaminathan and M. R. Nandhakumar, Daya publishing house, New Delhi.
- *Traditional Water Management Systems in India* Gyani Lal Badam and Vijay Paranjpye, Aryan Books International, New Delhi.
- *Environmental Ethics*, John Benson, Routledge, United Kingdom.
- *Ecology, Wild Life Conservation and Management*, Tapashi Gupta, EBH Publisher, Guwahati.



B.Sc.Part-I Semester-I BOTANY

DSC BOT- PR-I : 3DSC03BOT29: DSC BOTANYLAB - 1

Credits: 02

Practical: 60hrs.

Marks-50

(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 : 3OEC03LFS11: Life Science - I (Herbal Cosmetics - I)

Credits: 02

Practical: 60hrs.

Marks-50

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

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: 3DSC03BOT21: Reproductive Botany

Credits:02

Theory:30hrs.

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 microsporangogenesis, 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 (*Allium* sp.) 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: (7 Lectures.)

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–ISemester-II BOTANY

DSC-IV: 3DSC03BOT22: Diversity and Conservation of Plants

Credits:02

Theory:30hrs.

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 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 : 3DSC03BOT29: DSC BOTANYLAB - 2

Credits: 02

Practical: 60hrs.

Marks-50

(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.
- 16) Study tour.



B.Sc.Part–ISemester-II BOTANY

OEC LFS- PR-II : 3OEC3LFS21: 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.	
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Ques. paper code	
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VIVEKANAND COLLEGE, KOLHAPUR
(AN EMPOWERED AUTONOMOUS INSTITUTE)
B.Sc. Part- I (Botany) (Semester-I) Examination.....
Course Code and Name:3DSC03BOT11: Basic in Botany

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

Time: 2 hours
Marks: 30

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):

[4]

- i) Xyzabcdefghijklmnp -----
A) ----- B) ----- C) ----- D) -----
- ii) Xyzabcdefghijklmnp -----
A) ----- B) ----- C) ----- D) -----
- iii) Xyzabcdefghijklmnp -----
A) ----- B) ----- C) ----- D) -----
- iv) Xyzabcdefghijklmnp -----
A) ----- B) ----- C) ----- D) -----

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

[14]

- i) Xyzabcdefghijklmnp.
- ii) Xyzabcdefghijklmnp.
- iii) Xyzabcdefghijklmnp.

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

[12]

- i) Xyzabcdefghijklmnp.
- ii) Xyzabcdefghijklmnp.
- iii) Xyzabcdefghijklmnp.
- iv) Xyzabcdefghijklmnp.
- v) Xyzabcdefghijklmnp.



i) Evaluation Pattern for Theory Course:

Level	Semester	Activities per Semester	Marks
4.5	I & II	1) Home Assignment	10
		2) Midterm test	10
		Total Marks	20
5.0	III & IV	1) Seminar/Quiz/Open Book Exam	10
		2) Midterm test	10
		Total Marks	20
5.5	V & VI	1) Case study/Problem solving/Book review/Group Discussion/Poster Presentation/Seminar	10
		2) Midterm test	10
		Total Marks	20

ii) Evaluation Pattern for practical Course:

Course Name	CIE -Practical			SEE -Practical			
	Experimental work	Oral	Total Marks	Experimental work	Oral	Journal assessment	Total Marks
Major	15	05	20	20	05	05	30
OE	15	05	20	20	05	05	30

Note: CIE Practical Examination shall be conducted at midterm(after completion of 50% experiments)



Equivalence of Courses:
B.Sc. Part I (Semester I and II)

Semester	Course in NEP 2.0			Course in NEP3.0		
	Course code	Course Name	Credits	Course code	Course Name	Credits
I	2DSC03BOT11	Basic in Botany	2	3DSC03BOT11	Basic in Botany	2
	2DSC03BOT12	Plant Morphology	2	3DSC03BOT12	Plant Morphology	2
	2DSC03BOT19	DSC Botany Lab-1	2	3DSC03BOT19	DSC Botany Lab-1	2
	2OEC03LFS11	Life Science - I (Herbal Cosmetics - I)	2	3OEC03LFS11	Life Science - I (Herbal Cosmetics - I)	2
II	2DSC03BOT21	Reproductive Botany	2	3DSC03BOT21	Reproductive Botany	2
	2DSC03BOT22	Diversity and conservation of Plants	2	3DSC03BOT22	Diversity and conservation of Plants	2
	2DSC03BOT29	DSC Botany Lab-2	2	3DSC03BOT29	DSC Botany Lab-2	2
	2OEC03LFS21	Life Science - II (Herbal Cosmetics - II)	2	3OEC03LFS21	Life Science - II (Herbal Cosmetics - II)	2

