



Re-Accredited
Grade A by NAAC

SAURASHTRA UNIVERSITY

Syllabus on the bases of Choice Based Credit System (CBCS)

For

Semester III & IV (S.Y.B.Sc.)

BOTANY

SEMESTER – III

Paper No. B – 301: Plant Diversity – 2

SEMESTER – IV

Paper No. B – 401: Study of Plants with reference to Anatomy, Embryology, Physiology, Ecology and Application.

INFORCE FROM JUNE – 2017



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FOREWORD

Renewing and updating of the curriculum is an essential part of any vibrant university academic system. Revising the curriculum should be continues process to provide an updated education to the students at large. To meet the need and requirement of the society and in order to enhance the quality and standards of education, updating and restructuring of the curriculum must continue as a perpetual process. As a part of duty of study board, we the member of botany study board designed the new curriculum for Second year (i.e. semester III & IV) botany students. For designing of the curriculum we followed the UGC guideline for model curriculum. The exercise would not have been possible without the support of our respected faculties of botany. We hope that the results will fulfill expectations of the society.

(Dr. R. D. Raviya)

*Other than Chairman
Botany, Board of Studies
Saurashtra University
Rajkot*

(Dr. M. M. Jani)

*Chairman
Botany, Board of Studies
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(Dr. Mehul Rupani)

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(Dr. G. C. Bhimani)

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SAURASHTRA UNIVERSITY, RAJKOT

Syllabus of Semester – III & IV (S.Y. B.Sc.) Botany

Effective from June 2017

This curriculum consists of two theory papers and two practical. Syllabus has been divided in to two semesters (i.e. semester – III and IV). Students have to study one paper in each semester and two practical based on theory papers. The course is to be completed by assigning six periods for each theory and six periods for each practical per week. Practical periods are inclusive of field study.

GENERAL DETAILS OF TEACHING HOURS AND COURSE CREDIT

Paper no.	Title of the papers	Lectures	Theory Credit	Practical Credit	Total Credit
B – 301	Plant Diversity – 2	60	04	02	06
B – 401	Study of Plants with reference to Anatomy, Embryology, Physiology, Ecology and Application.	60	04	02	06

Pattern of Examination:

Students will have to attend theory and practical both during the semester and at the end of semester, University exams will be conducted. Examination contains 70% external and 30% internal marks. A student's performance during every practical session is assessed and marks for a maximum of 15 is recorded. External practical evaluation will carry 35 marks, so total 50 marks for each practical per paper examination will be counted. Internal assessment for theory can be following any one as mention below.

Sr. No.	Pattern of Internal Exam	Marks
A	Assignments	10
	MCQ Written Test	10
	Seminar/ presentation	10
OR		
B	MCQ Written Test	30
OR		
C	Assignments	10
	MCQ Written Test	20
OR		
D	Seminar/ presentation	10
	MCQ Written Test	20

Semester III & IV (Second Year B.Sc.)

SKELETON OF QUESTION PAPER FOR THEORY PAPERS (EXTERNAL EXAMS)

<i>QUESTION 1 – UNIT 1</i>		
<i>Q – 1 (A)</i>	<i>Objective type questions</i>	<i>4 Marks</i>
<i>Q – 1 (B)</i>	<i>Answer in brief (Any 1 out of 2)</i>	<i>2 Marks</i>
<i>Q – 1 (C)</i>	<i>Answer in detail (Any 1 out of 2)</i>	<i>3 Marks</i>
<i>Q – 1 (D)</i>	<i>Write a note on (Any 1 out of 2)</i>	<i>5 Marks</i>
<i>QUESTION 2 – UNIT 2</i>		
<i>Q – 2 (A)</i>	<i>Objective type questions</i>	<i>4 Marks</i>
<i>Q – 2 (B)</i>	<i>Answer in brief (Any 1 out of 2)</i>	<i>2 Marks</i>
<i>Q – 2 (C)</i>	<i>Answer in detail (Any 1 out of 2)</i>	<i>3 Marks</i>
<i>Q – 2 (D)</i>	<i>Write a note on (Any 1 out of 2)</i>	<i>5 Marks</i>
<i>QUESTION 3 – UNIT 3</i>		
<i>Q – 3 (A)</i>	<i>Objective type questions</i>	<i>4 Marks</i>
<i>Q – 3 (B)</i>	<i>Answer in brief (Any 1 out of 2)</i>	<i>2 Marks</i>
<i>Q – 3 (C)</i>	<i>Answer in detail (Any 1 out of 2)</i>	<i>3 Marks</i>
<i>Q – 3 (D)</i>	<i>Write a note on (Any 1 out of 2)</i>	<i>5 Marks</i>
<i>QUESTION 4 – UNIT 4</i>		
<i>Q – 4 (A)</i>	<i>Objective type questions</i>	<i>4 Marks</i>
<i>Q – 4 (B)</i>	<i>Answer in brief (Any 1 out of 2)</i>	<i>2 Marks</i>
<i>Q – 4 (C)</i>	<i>Answer in detail (Any 1 out of 2)</i>	<i>3 Marks</i>
<i>Q – 4 (D)</i>	<i>Write a note on (Any 1 out of 2)</i>	<i>5 Marks</i>
<i>QUESTION 5 – UNIT 5</i>		
<i>Q – 5 (A)</i>	<i>Objective type questions</i>	<i>4 Marks</i>
<i>Q – 5 (B)</i>	<i>Answer in brief (Any 1 out of 2)</i>	<i>2 Marks</i>
<i>Q – 5 (C)</i>	<i>Answer in detail (Any 1 out of 2)</i>	<i>3 Marks</i>
<i>Q 1 (D)</i>	<i>Write a note on (Any 1 out of 2)</i>	<i>5 Marks</i>
TOTAL MARKS : 70 TOTAL TIME : 2½ HOURS		

Total Scheme of evaluation

Semester	Theory			Practical		
	Internal	External	Total	Internal	External	Total
I	30	70	100	15	35	50
II	30	70	100	15	35	50

Minimum requirements of plant material and Instruments for Botany Practical based on Paper B - 301 and Paper B - 401

- Use of one micro scope for two students in practical batch
- Fresh plant material as well preserve material as per syllabus
- Different types of stain for slide preparation
- Charts for life cycles
- Original plant / Photographs / charts for Medicinal plants.
- Different types of stain for slide preparation
- Paper chromatography chamber and their equipment's & Chemicals
- Twig of plant and charts for Families

SAURASHTRA UNIVERSITY, RAJKOT

Faculty of Science

Course structure and Unique Code

Syllabus of Semester – III & IV (S.Y. B.Sc.) Botany

Effective from June 2017

<i>No</i>	<i>Course</i>	<i>Sem.</i>	<i>Paper name</i>	<i>Paper No.</i>	<i>Credit</i>	<i>Unique Code No of Paper</i>						
						<i>Year</i>	<i>Faculty</i>	<i>Subject</i>	<i>Level</i>	<i>Sem</i>	<i>Paper NO.</i>	<i>Option</i>
01	UG	III	<i>Plant Diversity – 2</i>	B-301	06	17	03	03	01	03	01	00
02	UG	IV	<i>Study of Plants with reference to Anatomy, Embryology, Physiology, Ecology and Application.</i>	B-401	06	17	03	03	01	04	02	00

New Theory Syllabus (CBCS) for Semester - III

In forced from June – 2017

BOTANY PAPER – 301

(PLANT DIVERSITY – 2)

UNIT – I : ALGAE

- I.1 Ultra structure of Eukaryotic algal cell.
- I.2 Ranges of Thallus Structure.
- I.3 Life history of the following genus (Excluding development)
(a) *Nostoc* (b) *Batrachospermum*
- I.4 Algae causing biological disturbances.

UNIT – II : FUNGI

- II.1 Ultra structure of fungal cell.
- II.2 Life history of the following genus (Excluding development)
(Classification according to Ainsworth)
(a) *Aspergillus* (b) *Saccharomyces*
- II.3 Industrial applications of above mention species.

UNIT – III : BRYOPHYTA

- III.1 Vegetative reproduction in Bryophytes.
- III.2 Life history of the following genus (Excluding development)
(a) *Marchantia* (b) *Funaria*
- III.3 Economic importance of Bryophytes.

UNIT – IV : PTERIDOPHYTA

- IV.1 Life history of the following genus (Excluding development)
(a) *Sellaginella* (b) *Adiantum*
- IV.2 Heterospory and seed habitat.
- IV.3 Types of stele and stellar evolution.
- IV.4 Telome Theory.

UNIT – V: GYMNOSPERM AND ANGIOSPERMS

V.1 Embryogeny and life history of *Pinus*.

V.2 Study of following plants families with 2 – 3 plants belonging to the families with reference to classification system of Bentham & Hooker's

(A) Dicotyledons

(1) Fabaceae

(2) Apiaceae

(3) Combretaceae

(4) Euphorbiaceae

(5) Verbenaceae

(6) Acanthaceae

(B) Monocotyledons

(1) Commelinaceae

(2) Amaryllidaceae

Semester – 3 (S.Y.B.Sc.) – BOTANY

PRACTICAL: P - 301

(Based on paper – 301-P)

1. Study of algal genera with reference to the types mentioned in theory
2. Study of fungal genera with reference to the types mentioned in theory
3. Study of Bryophytes genera with reference to the types mentioned in theory
4. Study of Pteridophytes genera with reference to the types mentioned in theory
5. Study of Gymnosperms genera with reference to the types mentioned in theory
6. Families are to be studied with the help of available plants as per theory.

❖ A twig of plant with flower / inflorescences

❖ Whole flower (various plants)

❖ L.S. of flower

❖ T.S. of flower

❖ Floral formula

❖ Floral diagram

❖ Botanical names

7. Study of various steles by section cutting.

New Theory Syllabus (CBCS) for Semester - IV
In forced from June – 2017
BOTANY PAPER – 401
(Study of Plants with reference to Anatomy, Embryology, Physiology,
Ecology and Application)

UNIT – I PLANT ANATOMY

- I.1 Anatomical studies of monocot and Dicot plants (Root, stem and leaf)
- I.2 Secondary growth in monocotyledons and dicotyledonos (Stem)
- I.3 Anomalous secondary growth in *Bignonia* and *Dracaen*.

UNIT – II PLANT EMBRYOLOGY

- II.1 Megasporogenesis
- II.2 Types of embryo sac
- II.3 Development of malegametophytes
- II.4 Double Fertilization.

UNIT – III PLANT PHYSIOLOGY

- III.1 Absorption of minerals
- III.2 Translocation of organic solutes.
- III.3 Diffusion, Imbibitions and Osmosis.
- III.4 Vernalization.
- III.5 Physiology of Seed dormancy.

UNIT – IV ECOLOGY

- IV.1 Edaphic factors – Soil: Composition, Origin & development, Soil profile
- IV.2 Soil erosion
- IV.3 Soil conservation
- IV.4 Remote sensing as a tool for vegetational analysis.

UNIT – V APPLIED BOTANY

- V.1 Artificial Seeds.
- V.2 Herbarium - Tool and technique
- V.3 Polyploidy in plants
- V.4 Pure line and mass selection
- V.5 Maternal Influence on inheritance
 - V.5.1 Cytoplasmic inheritance in Yeast
 - V.5.2 Cytoplasmic inheritance in *Mirabilis jalapa*

Semester -4 (S.Y.B.Sc.) – BOTANY

PRACTICAL: P – 401

(Based on paper – 401-P)

1. Study of different simple tissue systems of plants through section cutting.
2. To study of xylem component by maceration technique.
3. Anatomical studies of Secondary growth in Stem.
4. Study of anomalous secondary growth in *Bignonia* and *Dracaena*.
5. Germination of pollen grain
6. Mounting of embryo (Dicot/Monocot).
7. To study L.S. of Maize grain.
8. Imbibitions experiment.
9. Thistle funnel experiment for Osmosis.
10. Conduction of water through Xylem.
11. To demonstrate water holding capacity.
12. Test for the presence of carbonate, nitrate and pH of the soil.
13. Study tour – Farm / Research laboratory / Institutes / University for current trends in applied botany

A list of reference books

1. A text book of Algae A.V.S.S.Sambamurty
2. Algae B.R.Vashishta
3. Algae G.L.Chopra
4. The fungi B.P.Pandey
5. Introduction to fungi Dayal & Raizada
6. Bryophytes B.R.Vashishta
7. Cryptogamic Botany Vol. – I & Vol. – II G.M.Smith
8. Pteridophyta : New look O.P.Sharma
9. Pteridophytes P.C.Vashishta
10. Gymnosperms O.P.Sharma
11. A textbook of Systematic Botany R.N.Sutaria
12. An introduction to taxonomy of angiosperms Shukla P. & S.P.Sharma
13. Taxonomy of angiosperms B.P.Pandey
14. Taxonomy of angiosperms V.H.Naik
15. The Embryology of Angiosperms Bhojwani & Bhatnagar
16. A text book of Botany Singh, Pande & Jain
17. A textbook of ecology Vashishta & Gill
18. A textbook of Practical Botany Vol.–I & Vol.–II Bendra & Kumar
19. Anatomy and embryology Singh, Pandey & Jain
20. College Botany Vol. – I & Vol. – II B.P.Pandey
21. Ecology and Environment P.D.Sharma
22. Ecology and Soil Science Shukla & Sharma
23. Ecology and sustainable development S.Ramkrishnan
24. Embryology P.Maheshwary
25. Fundamentals of Ecology E.P.Odum
26. Plant Anatomy B.P.Pandey
27. Plant Anatomy P.J.Chandurkar
28. Plant Physiology P.L.Kocchar
29. Plant Physiology Pandey & Sinha
30. Plant Physiology Salisbury & Ross
31. Plant Physiology V.K.Jain
32. Plant Physiology V.Verma