SAURASHTRA UNIVERSITY

Accredited Grade 'A' by NAAC (CGPA 3.05)

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: Fundamental and Advance Botany

INFORCE FROM JUNE – 2020

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. This syllabus/curriculum designed by following members of Saurashtra University; held at 14-09-2019, Syndicate hall, Saurashtra University.

No.	Name	Designation
1	**Dr Mehul Rupani**	**Dean of Science faculty, Saurashtra University**
2	**Dr Vrunda Thaker**	**Member, Study Board of Botany, Saurashtra University**
3	**Dr R D Raviya**	**Member, Study Board of Botany, Saurashtra University**
4	**Dr Anila Patel**	**Member, Co-committee of Botany**
5	**Dr Ilza Mor**	**Member, Co-committee of Botany**
6	**Dr Jignasha Joshi**	**Member, Co-committee of Botany**
7	**Dr Rutva Dave**	**Member, Co-committee of Botany**
8	**Dr Manisha Sharma**	**Member, Co-committee of Botany**
9	**Dr Parth Bhatt**	**Member, Co-committee of Botany**

SAURASHTRA UNIVERSITY, RAJKOT

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

Effective from June 2020

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
I	Plant Diversity – 2	60	04	02	06
II	Fundamental & Advance Botany	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 latest formula provided by Higher Education Department, Government of Gujarat.

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

SKELETON OF QUESTION PAPER FOR THEORY PAPERS

(EXTERNAL EXAMS)

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

Total Scheme of evaluation

Semester	Theory			Practical		
	Internal	External	Total	Internal	External	Total
III	30	70	100	15	35	50
IV	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
- 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 2020

No	Course	Sem.	Paper name	Paper No.	Credit	Unique Code No of Paper						
						Year	Faculty	Subject	Level	Sem	Paper NO.	Option
01	UG	III	**Plant Diversity - 2**	B - 301	06	20	03	03	01	03	01	00
02	UG	IV	**Fundamental & Advance Botany**	B - 401	06	20	03	03	01	04	02	00

New Theory Syllabus (CBCS) for Semester - III

In forced from June – 2020

BOTANY PAPER – 301

(PLANT DIVERSITY – 2)

UNIT – I: ALGAE

I.1 Cell structure of Eukaryotic algae.

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 Cell structure of fungi.

II.2 Life history of the following genus (Excluding development)

(Classification according to Ainsworth)

(a) *Aspergillus* (b) *Saccharomyces* with haploid-diplontic life cycle

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 organ development)

(a) *Anthoceros* (b) *Funaria*

III.3 Economic importance of Bryophytes

UNIT – IV: PTERIDOPHYTA

IV.1 Life history of the following genus (Excluding organ development)

(a) *Adiantum*

IV.2 Types of stele and stellar evolution.

IV.3 Economic importance of Pteridophyta

UNIT – V: GYMNOSPERM AND ANGIOSPERMS

V.1 Life cycle of *Pinus* (Excluding organ development)

V.2 Classification of the following plants families as per Bentham & Hooker's system including examples of economic importance

(A) Dicotyledons

(1) Combretaceae (2) Verbenaceae (3) Euphorbiaceae

(B) Monocotyledons

(1) Commelinaceae

Semester – 3 (S.Y.B.Sc.) – BOTANY

PRACTICAL: P - 301

(Based on paper – 301)

1. Study of morphology, anatomy and reproductive structures in *Nostoc*
2. Study of morphology, anatomy and reproductive structures in *Batrachospermum*
3. Study of morphology, anatomy and reproductive structures in *Aspergillus*
4. Study of morphology, anatomy and reproductive structures in *Saccharomyces*
5. Study of morphology, anatomy and reproductive structures in *Anthoceros*
6. Study of morphology, anatomy and reproductive structures in *Funaria*
7. Study of morphology, anatomy and reproductive structures in *Adiantum*
8. Study of morphology, anatomy and reproductive structures in *Pinus*
9. Taxonomic study of Combretaceae family
10. Taxonomic study of Verbenaceae family
11. Taxonomic study of Euphorbiaceae family
12. Taxonomic study of Commelinaceae family
13. To study of steles by permanent
14. Field study / tour

New Theory Syllabus (CBCS) for Semester - IV

In forced from June – 2020

BOTANY PAPER – 401

(Fundamental & Advance Botany)

UNIT – I PLANT ANATOMY

I.1 Types of Simple tissue: Parenchyma, Collenchyma & Sclerenchyma

I.2 Types of Complex tissue: Xylem & Phloem

I.3 Anatomical studies of Monocot plant: Root, stem and leaf

I.4 Anatomical studies of Dicot plant: Root, stem and leaf

UNIT – II PLANT EMBRYOLOGY

II.1 Structure and germination of pollen grain

II.2 Types of Pollination

II.3 Structure and types of Ovule

II.4 Double Fertilization

UNIT – III PLANT PHYSIOLOGY AND ECOLOGY

III.1 Diffusion, Osmosis and Imbibition

III.2 Physiology of seed dormancy and dormancy breaking treatments

III.3. Soil composition and soil profile

III.4 Soil erosion and conservation

UNIT – IV BASIC TECHNIQUES IN BOTANY

IV.1 Herbarium: Tools and Technique

IV.2 Nursery technique: Grafting (Whip & Cleft) and Layering (Simple & Air)

IV.3 Kitchen gardening: Sowing/rising of seeds and seedlings,
Study of cultivation of different vegetables (Chilly, Tomato & fenugreek)

UNIT – V ADVANCE TECHNIQUES IN BOTANY

V.1 Hydroponics: Introduction, techniques and media

V.2 Intellectual Property Rights (IPR): Patent, Geographical Indication, Trademarks and Copyrights

V.3 Remote sensing as a tool for vegetational analysis

Semester -4 (S.Y.B.Sc.) – BOTANY

PRACTICAL: P – 401

(Based on paper – 401)

1. Study of different simple tissue system of plants through permanent slides
2. Study xylem components by maceration
3. Anatomical study of monocot plant: Root, stem and leaf
4. Anatomical study of dicot plant: Root, stem and leaf
5. Germination of pollen grain
6. Study of different types of ovule through permanent slides
7. Demonstration/Perform experiments: Diffusion, Osmosis and Imbibition
8. To study selected soil properties by spot test:

    (a) pH (b) Carbonate (c) Nitrate

9. Preparation of classical and e-Herbarium
10. To demonstrate different nursery technique through chart
11. Cultivation of vegetables (Chilly, Tomato & fenugreek) through kitchen garden techniques with using house hold things
12. To demonstrate/perform Hydroponics techniques
13. Field study / tour

S.Y.B.Sc. – BOTANY

SEMESTER – III PRACTICAL SKELETON

(BASED ON PAPER – 301)

TIME: - 3 HOURS **TOTAL MARKS:-35**

Q – 1 Identify & describe with labelled diagram **specimen A & B** **[06]**

Q – 2 Identify & describe **specimen C & D** **[06]**

Q – 3 Identified & draw labelled diagrams of **specimen E** **[03]**

Q – 4 Identify & describe the family & Show it to examiner **specimen F** **[05]**

Q – 5 Expose & show the preparation of **specimen G** to the examiner **[04]**

Q – 6 Rotation: Identify & Describe **specimen H, I, J** **[06]**

Q – 7 Certified Journal **[05]**

S.Y.B.Sc. BOTANY

SEMISTER – IV PRACTICAL SKELETON

(BASED ON PAPER – 401)

TIME: - 3 HOURS **TOTAL MARKS:-35**

Q – 1 Perform the experiment & show the results / show preparation to the examiner of **specimen A** **[06]**

Q – 2 Perform the experiment & show the results / show preparation of the **specimen B** to the examiner **[06]**

Q – 3 Perform the experiment & show the results / preparation of **specimen C** to the examiner **[06]**

Q – 4 Rotation: Identify & Describe **specimen D, E, F** **[09]**

Q – 5 (a) Viva-Voce **[03]**

(b) Certified journal **[05]**

List of Reference Books:

1. Bendre, A. M. and Ashok Kumar, (2009) A Text book of Practical Botany Vol. I & II. Rastogi Publications, Meerut. 9th edition.
2. Sundara Rajan, S., (1996). Introductory Taxonomy of Angiosperms. Himalaya Publishing House, Bombay/Delhi/Nagpur. 1st edition.
3. Datta, S. C. (1988). Systematic botany. Wiley eastern limited- New Delhi.4th edition.
4. Pandey, B.P. (1999). Taxonomy of Angiosperms. For university student. S. Chand and Com. Ltd, New Delhi 1st edition reprints.
5. Kumavesan Annie. (2010.) Taxonomy of Angiosprems. Saras publication, Nagercoil, Tamilnadu. 3rd edition.
6. Sutariya, R. N. (1958). A text book of Systematic Botany. Khadayata Book Depot, Ahmedabad. 2nd edition.
7. Singh, V. and Jain, D. K. (1996). Taxonomy of Angiosperms. Rastogi Publications, Meerut, India. 2nd edition.
8. Rana, S. V. S. (2009). Biotechniques Theory & Practice. Rastogi Publications, Meerut. 2nd edition.
9. Gupta, P. K. (2007). Genetics, cytology and evolution .Rastogi Publications, Meerut, New Delhi. 1st edition.
10. Gupta, P.K. (2007). Genetics-classical to modern Rastogi Publication-Meerut. 1st edition.
11. Gupta, P.K. (2007). Genetics Rastogi Publication-Meerut. 3rd edition.
12. Arumugam, N., Meyyan, R.P., Kumarsen, V., Sundaralingam, R. (2014) Genetics, Bio-metrics and Bioinformatics. Saras publication, Nagercoil, Tamilnadu. 1st edition.
13. Anne. Regaed. , Kumaresan, V., Arumugam, N. (2014) Algae. Saras publication, Kattar P.O. Nagercoil, Tamilnadu. 1st edition.
14. Gupta, P.K. (2010). Cell and molecular biology. Rastogi publications - Meerut 3rd edition.
15. Kochae, P. L. (1970). Genetics and Evolution. S. Nagin & Co., Delhi. 6th edition.
16. Bendre, A. M. and Ashok Kumar, (2009) A Text book of Practical Botany Vol. I & II. Rastogi Publications, Meerut. 9th edition.