SAURASHTRA UNIVERSITY
Accredited Grade ‘A’ by NAAC (CGPA 3.05)

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

For

Semester I & II (F.Y.B.Sc.)

BOTANY

SEMESTER – I


SEMESTER – II

Paper No. B – 201: Angiosperms, Tools and Techniques in Botany,
Biochemistry and Genetics

INFORCE FROM JUNE – 2016
FOREWORD

Renewing and updating of the curriculum is an essential part of any vibrant university academic system. Revising the curriculum should be a continuous 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 First year (i.e. semester I & II) 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)  (Dr. M. M. Jani)  (Dr. Mehul Rupani)  (Dr. G. C. Bhimani)
Other than Chairman  Chairman  Other than Dean  Dean
Botany, Board of Studies  Botany, Board of Studies  Faculty of Science  Faculty of Science
Saurashtra University  Saurashtra University  Saurashtra University  Saurashtra University
Rajkot  Rajkot  Rajkot  Rajkot
SAURASHTRA UNIVERSITY, RAJKOT

Syllabus of Semester – I & II (F.Y. B.Sc.) Botany

Effective from June 2016

This curriculum consists of two theory papers and two practical. Syllabus has been divided in to two semesters (i.e. semester – I and II). 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

<table>
<thead>
<tr>
<th>Paper no.</th>
<th>Title of the papers</th>
<th>Lectures</th>
<th>Theory Credit</th>
<th>Practical Credit</th>
<th>Total Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Plant Diversity</td>
<td>60</td>
<td>04</td>
<td>02</td>
<td>06</td>
</tr>
<tr>
<td>II</td>
<td>Angiosperms, Tools and Techniques in Botany, Biochemistry and Genetics</td>
<td>60</td>
<td>04</td>
<td>02</td>
<td>06</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Pattern of Internal Exam</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Assignments</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>MCQ Written Test</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Seminar/ presentation</td>
<td>10</td>
</tr>
<tr>
<td>OR</td>
<td>B</td>
<td>MCQ Written Test</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>MCQ Written Test</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>MCQ Written Test</td>
</tr>
</tbody>
</table>
### Semester I & II (First 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

<table>
<thead>
<tr>
<th>Semester</th>
<th>Theory</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Internal</td>
<td>External</td>
</tr>
<tr>
<td>I</td>
<td>15</td>
<td>35</td>
</tr>
<tr>
<td>II</td>
<td>15</td>
<td>35</td>
</tr>
</tbody>
</table>

Minimum requirements of plant material and Instruments for Botany Practical based on Paper B-101 and Paper B-201

- Use of one microscope 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 – I & II (F.Y. B.Sc.) Botany
Effective from June 2016

<table>
<thead>
<tr>
<th>No</th>
<th>Course</th>
<th>Sem .</th>
<th>Paper name</th>
<th>Paper No.</th>
<th>Credit</th>
<th>Year</th>
<th>Faculty</th>
<th>Subject</th>
<th>Level</th>
<th>Sem</th>
<th>Sem Paper NO.</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>UG</td>
<td>I</td>
<td>Plant Diversity</td>
<td>B - 101</td>
<td>06</td>
<td>16</td>
<td>03</td>
<td>03</td>
<td>01</td>
<td>01</td>
<td>01</td>
<td>00</td>
</tr>
<tr>
<td>02</td>
<td>UG</td>
<td>II</td>
<td>Angiosperms, Tools and Techniques in Botany, Biochemistry and Genetics</td>
<td>B - 201</td>
<td>06</td>
<td>16</td>
<td>03</td>
<td>03</td>
<td>01</td>
<td>02</td>
<td>02</td>
<td>00</td>
</tr>
</tbody>
</table>
Semester - I
Paper – B-101: Plant Diversity

Unit-1: Introductory Botany and Algae 0.8 Credit (12 Lectures)

1.1 Scope and objectives of Botany
1.2 Branches of Botany
1.3 Classification: Whittaker (Five Kingdom)
1.4 General characters, Smith’s classification and Algae in human welfare.
1.5 Life history of *Spyrogyra* (Chlorophyceae), *Sargassum* (Phaeophyceae) (Excluding development)

List of Reference Books:


Unit –2: Fungi 0.8 Credit (12 Lectures)

3.1 General characters, Alexopolus’ classification and fungi in human welfare.
3.2 Life history of *Mucor* (Zygomycotina), *Agaricus* (Bacidiomycotina) (Excluding development)
List of Reference Books:


Unit – 3: Bryophyte  

0.8 Credit  (12 Lectures)

4.1 General account and outline of classification of bryophytes by Rothmaller up to class

4.2 Life history of Riccia (Excluding development)

List of Reference Books:


Unit – 4: Pteridophyte  

0.8 Credit  (12 Lectures)

5.1 Origin, Evolution and Phylogeny of Land plants (General Account) with Geological time scale.

5.2 General accounts and outline of classification of Pteridophytes by G.M. Smith up to class

5.3 Life history of Nephrolepis  (Excluding development)
**List of Reference Books:**


**Unit – 5: Gymnosperm**

6.1 General characters, outline of classification by GM Smith and characters of gymnosperms classes

6.2 Life history of Cycus (Excluding development)

**List of Reference Books:**


Practical based on Paper B-101

1) Study of morphology, anatomy and reproductive structures in Spirogyra algae
2) Study of morphology, anatomy and reproductive structures in Sargassum algae
3) Study of morphology, anatomy and reproductive structures in Fungi : Mucor
4) Study of morphology, anatomy and reproductive structures in Fungi : Agaricus
5) Study of morphology, anatomy and reproductive structures in Riccia
6) Study of morphology, anatomy and reproductive structures in Nephrolepis
7) Study of morphology, anatomy and reproductive structures in Cycus
8) To study the Medicinal plants: Vitex negundo; Cassia fistula; Terminalia belerica; Emblica officinalis; Pongamia pinnata
9) Field study / Study Tour

List of Reference Books:

Semester II

Paper – B-201: Angiosperms, Tools and Techniques in Botany, Biochemistry and Genetics

Unit – 1: Vegetative Morphology 0.6 Credit (11 Lectures)

1.1 Habit, Habitat, Root and Stem (Excluding modification)

1.2 Leaf: Parts of leaf; phyllotaxis; types of leaves; venation.; stipules; leaf shapes; leaf margin; leaf base; leaf apex; venation.

Unit – 2: Reproductive Morphology 0.8 Credit (14 Lectures)

2.1 Inflorescences: Racemose and Cymose and special types – Cyathium, Verticillaste, Hypanthodium

2.2 Typical Flowers

2.2.1 Definition; bract; pedicel; symmetry; sexuality; hypogynous; epigynous; perigynous.

2.2.2 Calyx: function and types.

2.2.3 Corolla: function forms and aestivation.

2.2.4 Perianth

2.2.5 Androecium: Parts of a Stamen, Attachment

2.2.6 Gynoecium: Parts of carpels; function; placentation, Structure of stigma style and ovary

Types of fruit

2.2.7 Floral formula and Floral diagram

Unit – 3: Systematic Botany 0.5 Credit (10 Lectures)

3.1 Systems of classification – Bentham & Hooker with merits and demerits

3.2 Taxonomic studies of plants from each following angiosperm’s families

3.2.1 Malvaceae

3.2.2 Apocynaceae

3.2.3 Nyctaginaceae

3.2.4 Poaceae

List of Reference Books for Unit 1, 2 and 3


Unit – 4: Tools and Techniques in Botany 0.5 Credit (09 Lectures)

4.1 Principles and mechanisms of light and electron microscope
4.2 Principle and applications of paper chromatography techniques
4.3 Tissue culture (Basics, Media preparations, Applications, Brief introduction)
4.4 Principle and function of pH meter
4.5 Principles and function of colorimeter

List of Reference Books:


Unit – 5: Biochemistry and Genetics 1.6 Credit (16 Lectures)

5.1 Characters and classification (Reaction base and polarity base) of amino acids
5.2 β – Oxidation
5.3 Classification and action mechanisms of enzymes
5.5 Principles of Mendelian genetics
5.5 Structure of DNA
5.6 DNA replication
5.7 Protein synthesis

List of Reference Books:


Practical based on Paper B-201

1) Morphological studies of different plants parts – leaf
2) Morphological studies of different plants parts – Inflorescences
3) Morphological studies of different plants parts – Flowers (Calyx, Corolla, Perianth, Androcium, and Gynoecium).
4) Morphological studies of different plants parts – Fruits
5) Taxonomic study of Malvaceae family with its economical and medicinal values.
6) Taxonomic study of Apocynaceae family with its economical and medicinal values.
7) Taxonomic study of Nyctaginace family with its economical and medicinal values.
8) Enzyme activity of catalase, invertase, amylase
9) Study of plastids to examine pigment distribution in plants (e.g. Cassia, Lycopersicon, Capsicum).
10) To extract and separate chloroplast pigments by paper chromatographic technique
11) Visit of the research laboratories / Universities / Forest etc according to conveniences of colleges.

List of Reference Books:

Saurashtra University, Rajkot
Semester – I CBCS Subject: - Botany
Practical Examination
Practical Skeleton Based on Paper – B-101

Time: - 3 hours
Total Marks: - 35

Q – 1  Identify and classify the given specimen “A” and “B” with reasons------------------ (06)
       X                      Y
       A                      A
       B                      B

Q – 2  Identify and describe the specimen “C” and “D” with diagrams ------------------ (06)
       X                      Y
       C                      C
       D                      D

Q – 3  Identify and describe the specimen “E” and “F” ------------------------------ (06)
       X                      Y
       E                      E
       F                      F

Q – 4  Identify and describe the specimen “G” --------------------------------------- (04)
       X                      Y
       G                      G

Q – 5  Rotation H, I, J, K---------------------------------------------------------- (08)
       H –                    I –
       J –                    K –

Q - 6  Journal------------------------------------------------------------------------ (05)
Saurashtra University, Rajkot

Semester – II CBCS Subject: - Botany

Practical Examination

Practical Skeleton Based on Paper – B-201

Time: - 3 hours

Total Marks: - 35

Q – 1 Identify and classify the given families “A” and “B” by giving proper reasons, floral
Diagram and floral formula  {quote}----------------------------------------- (06)
X
A
B
Y
A
B

Q – 2 Identify and describe the specimen “C” and “D” (Morphology base) {quote}------------ (06)
X
C
D
Y
C
D

Q – 3 Submission of study report of the field visit {quote}--------------------------------------- (04)

Q – 4 Perform the enzyme activity of given enzyme sample {quote}----------------------------- (08)
OR
Separation of plant extract by paper chromatography {quote}----------------------------- (08)

Q – 5 Rotation E, F, G {quote}--------------------------------------------------------------- (06)

Q – 6 Journal {quote}---------------------------------------------------------------------------- (05)