SAURASHTRA UNIVERSITY- RAJKOT (Guj.)

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

For

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

BOTANY

SEMESTER – I

Paper No. B – 101: Plant Diversity

SEMESTER – II

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

INFORCE FROM JUNE – 2019

Conceptual Framework of the Syllabus of Botany-Semester I & II

Sr. No	Level UG or PG	Semester	Course Group Core Elective -1 Elective -2etc	Course (Paper) Title	Paper No.	Credit (Theory - 4 and practical -2)	Internal Marks for Theory	External Marks for Theory	Internal Marks for Practical	External Marks for Practical	Total Marks	Course (Paper) Unique Code
1	UG	1	1	Cryptogamic Botany	B-101	06	30	70	15	35	150	
2	UG	2	1	Angiosperms , Biochemistry, Genetics and Techniques	B- 201	06	30	70	15	35	150	

Total Scheme of evaluation

Semester No.	Theory Mark					Practical Mark				
	Internal Theory Mark	Internal Theory Passing Mark (40%)	External Theory Mark	External Theory Passing Mark (40%)	Total Theory Mark	Internal practical Mark	Internal practical Passing Mark (40%)	External practical Mark	External practical Passing Mark (40%)	Total Marks of practical
I	**30**	**12**	**70**	**28**	**100**	**15**	**6**	**35**	**14**	**50**
II	**30**	**12**	**70**	**28**	**100**	**15**	**6**	**35**	**14**	**50**

Semester I& II (First Year B.Sc.)

SKELETON OF QUESTION PAPER FOR THEORY PAPERS (EXTERNAL EXAMS)

Question 1A ,1B,1C and 1D From Unit -1 (14 Marks)		
Q – 1 (A)	Objective type four 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 2A ,2B, 2C and 2D From Unit -2 (14 Marks)		
Q – 2 (A)	Objective type four 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 3A , 3B, 3C and 3D From Unit -3 (14 Marks)		
Q – 3 (A)	Objective type four 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 4A , 4B, 4C and 4D From Unit -4 (14 Marks)		
Q – 4 (A)	Objective type four 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 5A , 5B, 5C and 5D From Unit -5 (14 Marks)		
Q – 5 (A)	Objective type four 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 – 5 (D)	Write a note on (Any 1 out of 2)	5 Marks
	Total Marks	**70 Marks**
Total Time Of Paper : 2½ HOURS		

Semester - I

Paper – B-101: Plant Diversity

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

1.1 Branches of Botany

1.2 Classification: Whittaker (Five Kingdom)

1.3 General characters, Smith's classification and Algae in human welfare.

1.4 Life history of *Spirogyra* (Chlorophyceae), *Sargassum* (Phaeophyceae) (Excluding development)

List of Reference Books:

1) *Smith, G. M. (1955). Cryptogamic Botany Vol. I Algae and Fungi. Tata McGraw hill Publishing Company Ltd., New Delhi. 2nd edition.*

2) *Singh, V., Pande, P. C., Jain, D. K.. (2014). A Text Book of Botany. Rastogi Publications, Meerut, New Delhi. 5th revised edition.*

3) *Singh, V., Pande, P. C., and Jain. D. K. (2015). A Text book of botany. Rastogi publications, Meerut, New Delhi. 4th edition.*

4) *Vashishta, B.R. (1987). Botany for degree students - Algae. S. Chand and company (Pvt.) Ltd Ram Nagar-New Delhi. 7th edition.*

5) *Anne. Regaed. , Kumaresan, V., Arumugam, N. (2014) Algae. Saras publication, Kattar P.O. Nagercoil, Tamilnadu. 1st edition.*

6) Gangulee, H. C., Das, K. S., Dutta, C. (2005). College Botany Volume – 1. New Central Book Agency, India 1st edition.

Unit –2: Fungi 0.8 Credit (12 Lectures)

2.1 General characters, Alexopolus' classification and fungi in human welfare.

2.2 Life history of *Mucor* (Zygomycotina), *Agaricus* (Bacidiomycotina) (Excluding development)

List of Reference Books:

1) *Smith, G. M. (1955). Cryptogamic Botany Vol. I Algae and Fungi. Tata McGrawhill Publishing Company Ltd., New Delhi. 2nd edition.*

2) *Singh, V., Pande, P. C., Jain, D. K... (2014). A Text Book of Botany. Rastogi Publications, Meerut, New Delhi. 5th revised edition.*

3) *Singh, V., Pande, P. C., and Jain. D. K. (2015). A Text book of botany. Rastogi publications, Meerut, New Delhi. 4th edition.*

4) *Vashishta, B.R., Sinha, A.K. (2002). Botany for degree students. Fungi- S.Chand.*

5) *Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.*

Unit – 3: Bryophyte 0.8 Credit (12 Lectures)

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

3.2 Life history of *Riccia* (Excluding development)

List of Reference Books:

1) *Smith, G. M. (1955). Cryptogamic Botany Vol. I Bryophytes and Pteridophytes. Tata McGraw hill Publishing Company Ltd., New Delhi. 2nd edition.*

2) *Singh, V., Pande, P. C., Jain, D. K... (2014). A Text Book of Botany. Rastogi Publication, Meerut, New Delhi. 5th revised edition.*

3) *Singh, V., Pande, P. C., and Jain. D. K. (2015). A Text book of botany. Rastogi publication, Meerut, New Delhi. 4th edition.*

4) Parihar, N.S. (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.

Unit – 4: Pteridophyte 0.8 Credit (12 Lectures)

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

4.2 Life history of *Nephrolepis* (Excluding development)

List of Reference Books:

1) *Smith, G. M. (1955). Cryptogamic Botany Vol. I Bryophytes and Pteridophytes. Tata McGraw hill Publishing Company Ltd., New Delhi. 2nd edition.*

2) *Singh, V., Pande, P. C., Jain, D. K... (2014). A Text Book of Botany. Rastogi Publications, Meerut, New Delhi. 5th revised edition.*

3) *Singh, V., Pande, P. C., and Jain. D. K. (2015). A Text book of botany. Rastogi publications, Meerut, New Delhi. 4th edition.*

4) Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India.

5) Parihar, N.S. (1991). An introduction to Embryophyta. Vol. I. Pteridophyta. Central Book Depot, Allahabad.

Unit – 5: Gymnosperm 0.8 Credit (12 Lectures)

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

5.2 Life history of *Cycas* (Excluding development)

List of Reference Books:

1) Singh, V., Pande, P. C., Jain, D. K... (2014). A Text Book of Botany. Rastogi Publications, Meerut, New Delhi. 5th revised edition.

2) Singh, V., Pande, P. C., and Jain. D. K. (2015). A Text book of Botany. Rastogi publications, meerut, New Delhi. 4th edition.

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 *Cycas*
8) To study the Medicinal plants: *Vitex negundo; Cassia fistula; Terminalia belerica; Emblica officinalis; Pongamia pinnata*
9) Field study

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.

Semester II

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

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

1.1 Habit, Habitat of plants
1.2 Root and Stem (Excluding modification)

1.3 Parts of leaf; phyllotaxis; types of leaves; venation.

1.4 Leaf shapes; leaf margin; leaf apex.

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

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 Rosaceae

3.2.2 Apocynaceae

3.2.3 Amaryllidaceae

List of Reference Books for Unit 1, 2 and 3

1) *Sundara Rajan, S., (1996). Introductory Taxonomy of Angiosperms. Himalaya Publishing House, Bombay/Delhi/Nagpur. 1st edition.*

2) *Datta, S. C. (1988). Systematic botany. Wiley eastern limited- New Delhi.4th edition.*

3) *Pandey, B.P. (1999). Taxonomy of Angiosperms. For university student. S. Chand and Com. Ltd, New Delhi 1st edition reprints.*

4) *Kumavesan Annie. (2010.) Taxonomy of Angiosprems. Saras publication, Nagercoil, Tamilnadu. 3rd edition.*

5) *Sutariya, R. N. (1958). A text book of Systematic Botany. Khadayata Book Depot, Ahmedabad. 2nd edition.*

6) *Singh, V. and Jain, D. K. (1996). Taxonomy of Angiosperms. Rastogi Publications, Meerut, India. 2nd edition.*

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

4.1 Principle and applications of paper chromatography techniques

4.2 Tissue culture (Applications, Brief introduction)

4.3 Principle and function of pH meter

4.4 Principles and function of Spectrophotometer

List of Reference Books:

1) Rana, S. V. S. (2009). Biotechniques Theory & Practice. Rastogi Publications, Meerut. 2nd edition.

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 Classification and action mechanisms of enzymes

5.3 Principles of Mendelian genetics

5.4 Structure of DNA

5.5 DNA replication

5.6 Protein synthesis

List of Reference Books:

1) *Gupta, P. K. (2007). Genetics, cytology and evolution .Rastogi Publications, Meerut, New Delhi. 1st edition.*

2) *Gupta, P.K. (2007). Genetics-classical to modern Rastogi Publication-Meerut. 1st edition.*

3) *Gupta, P.K. (2007). Genetics Rastogi Publication-Meerut. 3rd edition.*

4) *Arumugam, N., Meyyan, R.P., Kumarsen, V., Sundaralingam, R. (2014) Genetics, Bio- metrics and Bioinformatics. Saras publication, Nagercoil, Tamilnadu. 1st edition.*

5) *Anne. Regaed. , Kumaresan, V., Arumugam, N. (2014) Algae. Saras publication, Kattar P.O. Nagercoil, Tamilnadu. 1st edition.*

6) *Gupta, P.K. (2010). Cell and molecular biology. Rastogi publications - Meerut 3rd edition.*

7) *Kochae, P. L. (1970). Genetics and Evolution. S. Nagin & Co., Delhi. 6th edition.*

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)
4) Morphological studies of different plants parts – Flowers (Androcium, and Gynoecium).
5) Taxonomic study of Rosaceae family with its economical and medicinal values.
6) Taxonomic study of Apocynaceae family with its economical and medicinal values.
7) Taxonomic study of Amaryllidaceae family with its economical and medicinal values.
8) Enzyme activity of catalase, invertase, amylase
9) To extract and separate chloroplast pigments by paper chromatographic technique
10) Visit of the research laboratories / Universities / Forest etc according to conveniences of colleges.

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.*

SAURASHTRA UNIVERSITY RAJKOT

Semester – I CBCS, Subject: - Botany
Practical Examination

Practical Skeleton Based on Paper: B-101

Time: - 3 hours **Date: ----------** **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 **Date: ----------** **Total Marks: - 35**

Q – 1 Identify and classify the given families "A" and "B" by giving proper reasons, floral Diagram and floral formula ---------- (06)

X	**Y**
A –	*A* –
B –	*B*–

Q – 2 Identify and describe the specimen "C" and "D" (Morphology base) ---------- (06)

X	**Y**
C–	*C*–
D –	*D* –

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

Q – 4 Perform the enzyme activity of given enzyme sample ---------- (08)

OR

Separation of plant extract by paper chromatography ---------- (08)

Q – 5 Rotation ***E, F. G*** ---------- (06)

Q – 6 Journal ---------- (05)