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***Kachchh University***

Mundra Road

**BHUJ : 370 001**

 SYLLABUS ( CBCS )

**B. Sc. Semester V**

Botany

Code : USCEBO-507, USCEBO-508, USCEBO-509

With effect from June 2016

**KSKV Kachchh University, Bhuj - Kachchh**

T.Y. B.Sc. (Botany) Syllabus as CBCS System

**Semester V** (w.e.f. June 2016)

Name of the Paper : **Plant Diversity**

Paper No. : USCEBO-507

**Plant Diversity: Study of lower plants**

**Unit-1 Algae: Life History; Structure & Reproduction (Excluding development) [15 Marks]**

* 1. Cyanophyta: Oscillatoria
	2. Chlorophyta: Chara
	3. Phaeophyta: Sargassum
	4. Rhodophyta: Polysiphonia

**Unit-2 Fungi: Life History; Structure & Reproduction (Excluding development) [15 Marks]**

 2.1 Mastigomycotina: Phytopthora

 2.2 Ascomycotina: Aspergillus

 2.3 Basidiomycotina: Ustilago

**Unit-3 Bryophytes: Life History; Structure & Reproduction (Excluding development) [15 Marks]**

3.1 Hepaticopsida: Pellia

3.2 Anthocerotopsida: Notothyllus

3.3 Bryopsida: Sphagnum

**Unit-4 Pteridophytes: Life History; Structure & Reproduction (Excluding development) [ 15 Marks]**

 4.1 Lycopsida: Isoetes

 4.2 Pteropsida: Marselia

 4.3 Types of Stele

 4.4 Fossil: Definition, Types and Formation

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T.Y. B.Sc. (Botany) Syllabus as CBCS System

**Semester V** (w.e.f. June 2016)

Name of the Paper : **Plant Diversity (PRACTICAL)**

Code: USCEBO-507

**Study through Class work material and Permanent slide.**

1. Study the External feature and structure of thallus, Reproductive Organs of Oscillatoria
2. Study the External feature and structure of thallus, Reproductive Organs of Chara
3. Study the External feature and structure of thallus, Reproductive Organs of Sargassum
4. Study the External feature and structure of thallus, Reproductive Organs of Polysiphonia
5. Study the External feature and structure of thallus, Reproductive Organs of Phytopthora
6. Study the External feature and structure of thallus, Reproductive Organs of Aspergillus
7. Study the External feature and structure of thallus, Reproductive Organs of Ustilago
8. Study the External feature and structure of thallus, Reproductive Bodies of Pellia
9. Study the External feature and structure of thallus, Reproductive Bodies of Notothyllus
10. Study the External feature and structure of thallus, Reproductive Bodies of Sphagnum
11. Study the External feature and structure of thallus, Reproductive Bodies of Isoetes
12. Study the External feature and structure of thallus, Reproductive Bodies of Marselia
13. Types of Stele through permanent slides
14. Types of Fossils through Specimens

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T.Y. B.Sc. (Botany), CBCS System

**Semester V** (w.e.f. June 2016) **Botany: USCEBO - 507**

**Internal Practical Exam**

Total Marks: 20 Time:- 6 Hours

**Session-I**

**Total Marks: 10 Time: 3 Hours**

Ex.1 Identify and Describe Specimen **A** 2

Ex.2 Identify and Expose & show it to the examiner reproductive organ from Specimen **B** 3

Ex.3 Identify and classify giving reasons Specimen **C** 2

Ex.4 Expose, prepare a slide & Show it to the Examiner Specimen **D** 3

**Session-II**

**Total Marks: 10 Time: 3 Hours**

Ex.5 Idetify and Describe Specimen **E** 2

Ex.6 Identify and Describe the specimens 4 Specimen-1

 Specimen-2

Ex.7 Viva voce/ Submission 2

Ex.8 Journal 2

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T.Y. B.Sc. (Botany), CBCS System

**Semester V** (w.e.f. June 2016) **Botany: USCEBO - 507**

**Internal Practical Exam**

Total Marks: 30 Time:- 6 Hours

**Session-I**

**Total Marks: 10 Time: 3 Hours**

Ex.1 Identify and Describe Specimen **A** 3

Ex.2 Identify and Expose & show it to the examiner reproductive organ from Specimen **B** 5

Ex.3 Identify and classify giving reasons Specimen **C**  3

Ex.4 Expose, prepare a slide & Show it to the Examiner Specimen **D**  4

**Session-II**

**Total Marks: 10 Time: 3 Hours**

Ex.5 Identify and Describe Specimen **E** 4

Ex.6 Identify and Describe the specimens 6 Specimen-1

 Specimen-2

Ex.7 Viva voce/ Submission 3

Ex.8 Journal 2

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T.Y. B.Sc. (Botany) Syllabus as CBCS System

**Semester V** (w.e.f. June 2016)

Name of the Paper : **Systematic Botany, Angiosperms, Embryology and Anatomy**

Paper No. : USCEBO-508

**Unit-1 Systematic Botany [15 Marks]**

* 1. Principles of taxonomy, Classification, Merits & Demerits of System of classification of Bentham & Hooker, Engler & Prantle
	2. ICBN
		1. Typification
		2. Priority
		3. Effective & valid Publication
	3. Herbarium Techniques: Plant collection and preparation of herbarium
	4. Herbaria of INDIA
	5. Role of Herbaria and Botanical gardens

**Unit-2 Angiosperms [15 Marks]**

 2.1 Classification with reasons up to Family as per Bentham and Hooker’s classification (1862-1880) of following families;

2.1.1 Dicotyledons:

Polypetalae: Annonaceae, Capparidaceae, Rhamnaceae

 Gamopetalae: Asteraceae, Bignoniaceae, Lamiaceae

 Apetalae: Polygonaceae

 2.1.2 Monocotyledons: Commelinaceae, Cyperaceae

**Unit-3 Embryology [15 Marks]**

3.1 Palinology

 3.1.1 Definition

 3.1.2 Application of Palynology in Taxonomy, coal, oil Exploration and forensic

science

3.2 Endosperms: Types and functions

3.3 Embryo development in Dicotyledons: - Crusifer type

3.4 Embryo development in Monocotyledons: - Sagittaria, Sagittifolia type

3.5 Polyembryony: Defination, classification, causes, importance

3.6 Apomixis, Apospory, parthenogenesis

**Unit-4 Anatomy [15 Marks]**

 4.1 Root development: Lateral root, root hairs

 4.2 Root-Stem transition: Definition and Types

 4.3 Anomalous Secondary growth

 4.3.1 Abnormal behavior of cambium: Achyranthes

 4.3.2 Accessory cambium: Bougainvillea, Carrot

 4.4 Microtomy & Methods of Slide preparation

4.4.1 Collection of material, Fixation, Preservation

4.4.2 dehydration, infiltration, embedding and block making

4.4.3 Sectioning with microtome

4.4.4 Stains, Staining and Mounting

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T.Y. B.Sc. (Botany) Syllabus as CBCS System

**Semester V** (w.e.f. June 2016)

Name of the Paper : **Systematic Botany, Angiosperms, Embryology and Anatomy (PRACTICAL)**

Code: USCEBO-508

1. Preparation of Herbarium
2. Study of Taxonomy as per syllabus (Families)
3. To dissect out globular embryo
4. To dissect out heart shape embryo
5. To remove mature dicot embryo
6. L.s. of maize grain showing monocot embryo
7. L.s. of ovule showing nuclear /cellular/ helobial endosperm
8. Demonstration of Microtomy & Methods of Slide preparation
9. Study of anomalous secondary growth in Achyranthus
10. Study of anomalous secondary growth in Bougainvillea
11. Study of anomalous secondary growth in Carrot
12. Submission
13. Visit/ Excursion
14. Journal

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T.Y. B.Sc. (Botany), CBCS System

**Semester V** (w.e.f. June 2016) **Botany: USCEBO - 508**

**Internal Practical Exam**

Total Marks: 20 Time:- 6 Hours

**Session-I**

**Total Marks: 10 Time: 3 Hours**

Ex.1 Identify and Classify giving reasons Specimen **A** (No diagrams) 2

Ex.2 Identify and Classify & Describe morphological characteristics of Specimen B (All diagrams) 2

Ex.3 Expose and mount Embryo from Specimen C 3

Ex.4 Expose & prepare your slide & Show to the Examiner Specimen D 3

**Session-II**

**Total Marks: 10 Time: 3 Hours**

Ex.5 Prepare slide from given Specimen E , Double Stain it and show it to examiner 3

Ex.6 Identify and Describe the specimens 3 Specimen-1

 Specimen-2

Ex.7 Viva voce/ Submission 2

Ex.8 Journal 2

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T.Y. B.Sc. (Botany), CBCS System

**Semester V** (w.e.f. June 2016) **Botany: USCEBO - 508**

**External Practical Exam**

Total Marks: 30 Time:- 6 Hours

**Session-I**

**Total Marks: 15 Time: 3 Hours**

Ex.1 Identify and Classify giving reasons Specimen **A** (No diagrams) 3

Ex.2 Identify and Classify & Describe morphological characteristics of Specimen B (All diagrams) 3

Ex.3 Expose and mount Embryo from Specimen C 4

Ex.4 Expose & prepare your slide & Show to the Examiner Specimen D 4

**Session-II**

**Total Marks: 15 Time: 3 Hours**

Ex.5 Prepare slide from given Specimen E , Double Stain it and show it to examiner 6

Ex.6 Identify and Describe the specimens 4 Specimen-1

 Specimen-2

Ex.7 Viva voce/ Submission 3

Ex.8 Journal 3

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T.Y. B.Sc. (Botany) Syllabus as CBCS System

**Semester V** (w.e.f. June 2016)

Name of the Paper : **Plant Physiology, Biochemistry, Genetics & Mol. biology and Biotechnology & Industrial Botany**

Paper No.: USCEBO-509

**Unit-1 Plant Physiology [15 Marks]**

* 1. Dormancy:
		1. Causes of dormancy
		2. Methods of breaking dormancy
	2. Germination
		1. Different phases
		2. Factors affecting
	3. Growth
		1. Role of PGRs (Auxin, Gibberellins, Cytokinin, Abscisic acids and Ethylene)
	4. Respiration
		1. PPP – Pentose Phosphate Pathway
		2. RQ and Factors affecting

**Unit-2 Biochemistry [15 Marks]**

2.1 Primary & secondary Metabolites, Introduction to Alkaloids, Terpenoids and Phenolics

2.2 Lipid metabolism: Saturated and Unsaturated fatty acids, Synthesis, Alpha & Beta- oxidation

 2.3 Amino acid & Protein metabolism:

2.3.1 Amino acids: Structure, Classification of Amino acids, Protein and Non-protein amino acids

2.3.2 Peptide boned & polypeptides, Classification of Proteins on the basis of Structure

**Unit-3 Genetics & Molecular biology [15 Marks]**

3.1 Gene Expression: Transcription & Translation

3.2 Genetic Variation & Cytogenetics

 3.2.1 Chromosomal mutation: Types

 3.2.2 Gene Mutation: Types, Spontaneous and Induced

3.2.4 Regulation of Gene Expression: Prokaryotes: - Lac & Tryptophan operon and

in Eukaryotes

 3.3 DNA finger printing & its importance

 3.4 DNA damage & repair

**Unit-4 Biotechnology & Industrial Botany [15 Marks]**

 4.1 Genetic Engineering

 4.1.1 r-DNA technology

 4.2.2 Vectors for gene delivery, methods of gene delivery

4.2.3 Development of transgenic Plant-Bt cotton

4.2 PTC- Plant Tissue Culture: General account, Cellular differentiation and Totipotency, Organogenesis and Embryogenesis.

4.3 Industrial Botany

 4.3.1 Antibiotics 4.3.4 Herbal Drug Technology

 4.3.2 Bio-pesticides 4.3.5 Medical Mushrooms

 4.3.3 Bio-fertilizers

**Sem V Botany USCEBO-509 Practical**

1. To test germinability of seeds with tetrazolium
2. To demonstrate Geotropism by Clinostat
3. Measurement of Growth using Auxanometer
4. To study the effect of Gibberalic acid on plant growth
5. To determine the value of RQ of different respiratory substrates
6. To test the presence of Protein
7. Separation of Amino acids in a mixture by Paper Chromatography
8. Study through Chart/ Photograph: Chromosomal Mutation
9. Study through Chart/ Photograph: Gene Mutation
10. Study through Chart/ Photograph: Lac & Tryptophan operon
11. Study through Chart/ Photograph: r-DNA technology
12. Study through Chart/ Photograph: Development of Transgenic Plant: Bt Cotton
13. Study through Chart/ Photograph: Concepts of PTC - Embryogenesis
14. Study through Chart/ Photograph: Industrial Botany
15. Preparation of Crude Bio-pesticide (any one) & Herbal Drug (any one)
16. Excursion/ Project work-report
17. Journal

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T.Y. B.Sc. (Botany), CBCS System

**Semester V** (w.e.f. June 2016) **Botany: USCEBO - 509**

**Internal Practical Exam**

Total Marks: 20 Time:- 6 Hours

**Session-I**

**Total Marks: 10 Time: 3 Hours**

Ex.1 Perform the physiological experiment assigned to you. Tabulate your observations and

Calculate. Show your experiments and records to the Examiner 3

Ex.2 Perform the experiments as per slip and show your results to the Examiner 3

Ex.3 Solve the genetic problem as per the slip 2

Ex.4 Solve the genetic problem as per the slip 2

**Session-II**

**Total Marks: 10 Time: 3 Hours**

Ex.5 Identify and Describe 3

Ex.6 Identify and describe the specimens/ Chart 3 Specimen-1

 Specimen-2

Ex.7 Viva voce/ Project Submission 2

Ex.8 Journal 2

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T.Y. B.Sc. (Botany), CBCS System

**Semester V** (w.e.f. June 2016) **Botany: USCEBO - 509**

**External Practical Exam**

Total Marks: 30 Time:- 6 Hours

**Session-I**

**Total Marks: 10 Time: 3 Hours**

Ex.1 Perform the physiological experiment assigned to you. Tabulate your observations and

Calculate. Show your experiments and records to the Examiner 5

Ex.2 Perform the experiments as per slip and show your results to the Examiner 5

Ex.3 Solve the genetic problem as per the slip 3

Ex.4 Solve the genetic problem as per the slip 3

**Session-II**

**Total Marks: 10 Time: 3 Hours**

Ex.5 Identify and Describe 5

Ex.6 Identify and describe the specimens/ Chart 4 Specimen-1

 Specimen-2

Ex.7 Viva voce/ Project Submission 3

Ex.8 Journal 2