SEMESTER 1

Generic Elective (GE- 1)

Biodiversity (Microbes, Algae, Fungi and Archegoniate)

(Credits: Theory-4, Practical-2) F.M.-75

QUESTION PATTERN: In all **eight (08)** questions of equal value (15 marks each) will be set, out of which a student shall have to answer FIVE questions. Group-A, Question No. 1 will be compulsory and should ask for a self-explanatory well labelled diagram on any topic from the syllabus. Group-B, Question No.s 2, 3 and 4 will be short answer questions out of which a student shall answer any TWO. Group-C, Question No.s 5, 6, 7 and 8 will be long answer questions of which a student shall answer any TWO.

Lectures: 60

Unit 1: Microbes (10 lectures)
Viruses –General structure, TMV; Economic importance
Bacteria –General characteristics and cell structure; Economic importance.

Unit 2: Algae (12 lectures)
General characteristics; Morphology and life-cycles of the following: *Nostoc*, *Volvox*, *Oedogonium, Batrachospermum*. Economic importance of algae.

Unit 3: Fungi (12 lectures)
General characteristics, life cycle of *Albugo, Peziza, Agaricus, Alternaria*
Symbiotic Associations-Lichens

Unit 5: Bryophytes (10 lectures)
General characteristics, morphology, reproduction of *Marchantia, Anthoceros and Sphagnum*

Unit 6: Pteridophytes (8 lectures)
General characteristics, morphology and reproduction of *Selaginella* and *Pteris*.(Developmental details not to be included).Heterospory and seed habit, stelar evolution.

U nit 4: Gymnosperms (6 lectures)
General characteristics; morphology, and reproduction of *Pinus*(Developmental details not to be included).

SEMESTER II

Generic Elective (GE-2)

Plant Ecology and Taxonomy

(Credits: Theory-4, Practical-2) F.M.- 75

QUESTION PATTERN: In all **eight (08)** questions of equal value (15 marks each) will be set, out of which a student shall have to answer FIVE questions. Group-A, Question No. 1 will be compulsory and should ask for a self-explanatory well labelled diagram on any topic from the syllabus. Group-B, Question No.s 2, 3 and 4 will be short answer questions out of which a student shall answer any TWO. Group-C, Question No.s 5, 6, 7 and 8 will be long answer questions of which a student shall answer any TWO.

Unit 1: Introduction to Ecology **(2 lectures)**

Unit 2: Ecological factors **(10 lectures)**
Soil: Origin, formation, composition, soil profile. Water: States of water in the environment, precipitation types. Light and temperature: Variation Optimal and limiting factors; Shelford law of tolerance. Adaptation of hydrophytes and xerophytes

Unit 3: Plant communities **(12 lectures)**
Characters; Succession; Processes and types

Unit 4: Ecosystem **(10 lectures)**
Structure; energy flow trophic organisation; Food chains and food webs, Ecological pyramids;
Biogeochemical cycling; Cycling of carbon, nitrogen.

Unit 5: Pollution
Air & Water – Cause & Control.

U nit 6 Introduction to plant taxonomy **(2 lectures)**
Identification, Classification, Nomenclature.

Unit 9 Taxonomic hierarchy (outline) **(2 lectures)**
Ranks, categories and taxonomic groups

U nit 10 Botanical nomenclature **(6 lectures)**
Principles and rules of IUCN

Unit 11 Classification **(6 lectures)**
Types of classification-artificial, natural and phylogenetic. Bentham and Hooker (upto series),Hutchinson (upto orders).

Unit 12 Angiospermic Families (10 lectures)
Catharanthaceae, Acanthaceae, Amaranthaceae, Lamiaceae, Cyperaceae

SEMESTER III

Generic Elective (GE- 3)

Plant Anatomy and Embryology

(Credits: Theory-4, Practical-2) F.M.- 75

QUESTION PATTERN: In all **eight (08)** questions of equal value (15 marks each) will be set, out of which a student shall have to answer FIVE questions. Group-A, Question No. 1 will be compulsory and should ask for a self-explanatory well labelled diagram on any topic from the syllabus. Group-B, Question No.s 2, 3 and 4 will be short answer questions out of which a student shall answer any TWO. Group-C, Question No.s 5, 6, 7 and 8 will be long answer questions of which a student shall answer any TWO.

Lectures: 60

Unit 1: Meristematic tissues (8 lectures)
Apical, Intercalary and Lateral Meristems; simple and complex tissues

Unit 2: Secondary Growth (8 lectures)
Vascular cambium – structure and function, seasonal activity. Normal and Abnormal growth

Unit 3: Anomalous secondary growth
Boerhavia, Dracaena and Tinospora

Unit 4: Structural organization of flower (8 lectures)
Structure of anther and pollen; Structure and types of ovules; Types of embryo sacs, organization

Unit 5: Fertilization (8 lectures)
Double fertilization

Unit 7: Embryo and endosperm (8 lectures)
Endosperm types, structure and functions; Dicot and monocot embryo; Embryo endosperm Relationship

SEMESTER IV

Generic Elective (GE- 4)

Plant Physiology, Cytogenetics and Biotechnology

(Credits: Theory-4, Practical-2) F.M.- 75

QUESTION PATTERN: In all **eight (08)** questions of equal value (15 marks each) will be set, out of which a student shall have to answer FIVE questions. Group-A, Question No. 1 will be compulsory and should ask for a self-explanatory well labelled diagram on any topic from the syllabus. Group-B, Question No.s 2, 3 and 4 will be short answer questions out of which a student shall answer any TWO. Group-C, Question No.s 5, 6, 7 and 8 will be long answer questions of which a student shall answer any TWO.

Lectures: 60

UNIT – 1 - 25

1. Transpiration - Mechanism & significance
2. Ascent of Sap – Root Pressure transpiration pull, theory
3. Photosynthesis – Photophosphorylation, C_3, C4 Cycle
4. Respiration – Glycolysis, TCA Cycle.
5. Growth Hormone – Auxins, Gibberellins

UNIT – 2 - 25

1. Structure of Cytoplasmic Cell Organelles – Mitochondria, Chloroplast, Ribosome
2. Cell Division – Mitosis, Meiosis,
3. Principles of inheritance, Mendel's Law
4. Complimentary Genes & Epistasis
5. Gene – Mutation & Polyploidy

UNIT – 3 - 5

Plant Tissue Culture – History, Requirement, Technique & Application