TURA GOVERNMENT COLLEGE, TURA
DEPARTMENT OF BOTANY

Allotment of Topics of Syllabus : Odd - Semester

1. **Shri Rajiv K Marak, Associate Professor.**

Semester – 1: Paper – 1:

Unit – 3:

1. Classification of bryophytes according to Proskauer.
2. Origin and range of gametophyte structure in bryophytes.
3. Reproduction in bryophytes

Semester – 3: Paper – 3:

Unit 4

1. Floristic regions of India.
2. Continuous and discontinuous plant distribution in India: Factors and theories.
3. Centre of origin of plants (Primary and Secondary centres).
4. Barriers to plant migration.

Semester – 5: Paper – 5:

Unit 4:

1. Structure and classification of carbohydrates, amino acids and proteins. Levels of protein Structure - primary, secondary and tertiary.
2. Enzymes - Classification, structure and mechanism of action (characteristics of enzyme Active sites, kinetics of enzyme catalysis, Vitamins as co-enzymes).

Paper - 5: Practical: (Plant Physiology and Biochemistry)

1. Study of transpiration rate in dorsiventral leaves by Blackman's apparatus.
2. Determination of water potential by plasmolytic and gravimetric method.
3. Study of the effect of light on oxygen evolution during photosynthesis by Winkler's Method.
4. Preparation of standard curves for estimation of the following
   a) Starch by I_2KI method.
   b) Amino acid by Ninhydrin reagent.
5. Separation of amino acids by paper chromatography
6. Effect of substrate concentration on amylase activity.

2. Smt. Noda Merrie R Marak, Senior Lecturer.

Semester – 1 : Paper - 1: (Theory) (Algae, Bryophyte and Pteridophyte)

Unit 3

1. Evolution of sporophyte and gametophyte in bryophyte.

2. Life cycles of Anthoceros, Marchantia and Sphagnum.

Practical: Paper - 1 (Algae, Bryophyte and Pteridophyte)

1. Study of vegetative and reproductive parts with the help of temporary preparation of all types of genera prescribed in Paper - 1.
2. Dissection, sectioning, drawing, description and identification of the specimens covered in the preparations.

Semester – 3 : Paper – 3 (Theory)

(Angiosperm taxonomy, Economic Botany, Ethnobotany and Phytogeography)

Unit 2

1. Distinguishing features and economic importance of the following dicotyledonous families: Ranunculaceae , Fabaceae, Asteraceae, Solanaceae, Verbenaceae

Semester – 5: Paper – 5 (Theory) (Plant Physiology and Biochemistry)

Unit 2

1. Respiration: Glycolysis, Kreb's cycle, Electron transport chain.

Paper - 6: (Theory) (Ecology and Conservation Biology)

Unit 4

1. Air, water and soil pollution sources, effects and abatement.
2. Global environmental problems: Causes , consequences and remedial measures of ozone layer depletion , climate change and global warming (greenhouse effect) ,desertification

3. Smt. Shabaree Yasmeen A Sangma, Senior Lecturer

Semester – I: Paper – 1 (Theory)

Unit 4:

1. Heterospory
2. Seed habit.
3. Life Cycles of *Lycopodium*
4. Life Cycles of *Selaginella.*
5. Economic and ecological importance of pteridophytes.

Semester – III : Paper - 3 (Theory)

Unit 3:

1. Ethnobotany and its significance; study of some ethnobotanical plants of north Eastern India having medicinal and food values.
2. Cultivation and processing of tea and rubber.

Paper - 3: Practical

(Angiosperm Taxonomy, Economic Botany, Ethnobotany and Phytogeography)

1. Taxonomic studies of angiosperm plants belonging to both dicot and monocot families mentioned in paper 3. Flower dissection, drawing and description in technical language, and identification up to Genera.
2. Qualitative detection of starch, protein, fat and cellulose in plant materials by chemical tests.
3. Spotting: Economically important plants or plant products prescribed in paper 3.
4. Techniques for preparation of herbarium sheets of flowering plants and submission of at least 5 herbarium sheets.
5. Study of 5 plants having ethnobotanical importance.
6. One local fieldtrip of botanical relevance.

Paper - 5: Theory

Unit 2:

1. Biological Nitrogen fixation.

Paper - 6: Theory

Unit 4:

1. Plant Diversity and Conservation: Magnitude of vascular plant diversity in India,
2. Plant conservation measures – in-situ (Biosphere Reserve, National Parks, Wild life Sanctuary, World Heritage Site and Community Conserved Area)
3. Ex-situ (Botanical Garden, Seed Bank, Gene Bank and Cryopreservation).

4. **Manman A Sangma, Lecturer**
Semester – 1: Paper - 1 (Theory)

Unit 2

1. Origin and evolution of sex in algae
2. Pigmentation in algae
3. Economic importance of algae

Paper - 1 : Practical

1. Study of vegetative and reproductive parts with the help of temporary slide preparations of all types of genera prescribed in Paper - 1 (Theory).
2. Dissection, sectioning, drawing, description and identification of the specimens covered in the preparations.

Semester - 3
Paper - 3: Theory
Unit - 3

1. Study of economically important plants – cereals, pulses, oil-yielding, spices, condiments, fibres, ornamentals and aromatic (Scientific names, families and parts used of at least three plants under each category).

Semester – 5
Paper - 5: Theory
Unit - 3

1. Photoperiodism and Vernalization.
2. Physiological effects of auxins, gibberellins, ABA and cytokinins.
3. Seed dormancy and its regulation.
4. Physiology of senescence.

Paper - 6: Theory

Unit - 3

1. Functional attributes of ecosystem: Flow of energy (Box and Pipe Model), Ecological Pyramids, Primary Production (types and distribution), Food Chain and Food web.
2. Biogeochemical cycles: Hydrological cycles, Gaseous cycle (Carbon) and Sedimentary Cycle (Phosphorus).

Paper - 6: Practical

1. Determination of pH of soil samples of various sites using pH meter.
2. Determination of moisture content of two different soil samples using gravimetric method.
3. Determination of soil organic matter content of different soil samples by Walkley and Black's rapid titration method.

4. Determination of requisite size and requisite number of quadrats for the study of a plant community.
5. Determination of frequency, density, abundance, and basal area by quadrat method and IVI.
6. Study of morphological and anatomical features of xerophytes, hydrophytes, and epiphytes.
7. Study of spatial and temporal variations in climatic factors – light, temperature and relative humidity.

5. Shri Debasish R. Marak, Lecturer

Semester- I
Paper 1: Theory

(Algae, Bryophytes and Pteridophytes)

Unit 4

1. Classification of Pteridophytes by Smith.
2. Evolution of stele in Pteridophytes and telome concept

Paper 1: Practical

1. Study of vegetative and reproductive parts with the help of temporary preparation of all types of genera prescribed in paper 1
2. Dissection, sectioning, drawing, description and identification of the specimen covered in the preparation.

Semester - 3
Paper 3: Theory

(Angiosperm taxonomy, Economic Botany, Ethnobotany)

Unit 1

1. Major system of classification- artificial, natural and phylogenetic
2. Bentham and Hooker's and Hutchinson's system of classification
3. I.C.N – Principles of Botanical Nomenclature, Type method and typification, and rules and limitation of Priority.

Semester - 5
Paper 6: Theory

(Ecology and Conservation Biology)

Unit 2

1. Population ecology: Attributes of Plant population, mortality, natality, survivorship curves and population growth.
2. Population interaction: Types of Interaction, symbiosis, parasitism, commensalism, proto-cooperation and competition.

3. Community ecology: community structure- qualitative and quantitative attributes of community; hydrosere and xerosere

Paper 6: Practical

(Ecology and Conservation Biology)

1. Determination of soil pH soil samples of various sites using pH meter.
2. Determination of moisture content of two different soil samples using gravimetric method.
3. Determination of soil organic matter content of different soil samples by Walkley and Blacks rapid titration method.
4. Determination of requisite size and requisite number of quadrats for the study of a plant community.
5. Determination of frequency, density, abundance and basal area by quadrat method and IVI.
6. Study of morphological and anatomical features of xerophytes, hydrophytes and epiphytes.
7. Study of spatial and temporal variation in climatic factors- light, temperature and relative humidity.

6. Shri Aloster Nongrum, Assistant Professor.

Semester – 1: Paper 1: Theory

(Algae, Bryophytes and Pteridophytes)

Unit 1

1. Classification of Algae according to Fritsch and Lee
2. Range of vegetative and reproductive structures of Chlorophyceae, Bacillariophyceae

Unit 2

1. Life cycles of Chara, Oedogonium, Centric diatoms

Semester - 3: Paper - 3: Theory

(Angiosperm taxonomy, Economic Botany, Ethnobotany and Phytogeography)

Unit 2

1. Distinguishing features and economic importance of the following dicotyledonous families: Lamiaceae
2. Distinguishing features and economic importance of the following monocotyledonous families: Liliaceae, Zingiberaceae, Orchidaceae and Poaceae

Paper 3: Practical

(Angiosperm taxonomy, Economic Botany, Ethnobotany and Phytogeography)

1. Taxonomic studies of angiosperm plants belonging to both dicot and monocot families mentioned in Paper 3. Flower dissection, drawing and description in technical language, and identification up to Genera.
2. Qualitative detection of starch, protein, fat and cellulose in plant materials by chemical tests.
3. Spotting: Economically important plants or plant products prescribed in Paper 3.
4. Techniques for preparation of herbarium sheets of flowering plants and submission of at least 5 herbarium sheets.
5. Study of 5 plants having ethnobotanical importance.
6. One local field trip of botanical relevance.

Semester – 5: Paper - 5: Theory (Plant Physiology and Biochemistry)

Unit 1

1. Water potential and its significance
2. Translocation of minerals; active and passive transport
3. Mineral nutrition (micro and macro nutrients, criteria of essentiality- properties and deficiency symptoms)

Unit 2

1. Photosynthesis: structure of chloroplast, photosynthetic pigments, PSI and PSII, mechanism of C3, C4 and CAM pathways, photosynthetic electron transport chain, and effect of environmental factors on photosynthesis

Unit 4

3. Laws of Thermodynamics.

Paper - 5: Practical: (Plant Physiology and Biochemistry)

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2. Determination of water potential by plasmolytic and gravimetric method.
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   a) Starch by I_2KI method.
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5. Separation of amino acids by paper chromatography
6. Effect of substrate concentration on amylase activity.

7. Smt. Stilchi M Sangma, Lecturer.

Semester – 1: Paper – 1 (Theory) (Algae, Bryophytes and Pteridophytes)

Unit 1

1. Range of Vegetative and Reproductive structures of Phaeophyceae
2. Range of Vegetative and reproductive structures of Rhodophyceae
3. Life cycle types in green algae
4. Life cycle of *Ectocarpus* and *Polysiphonia*

Semester – 3: Paper - 3: Theory

(Angiosperm Taxonomy, Economic Botany, Ethnobotany and Phytogeography)

Unit - 3

1. Characteristics, cultivation and uses of aromatic and medicinal plants (*Citronella* and *Rauwolfia*).
2. Characteristics, cultivation and uses of timber yielding plants (Teak and Sal)

Semester – 5: Paper - 6 (Theory) (Ecology and Conservation Biology)

Unit – 1

1. Ecological Factors: Climatic, light, temperature, precipitation and fire).
2. Edaphic (soil formation process, soil types, soil texture, soil profile, soil reaction and soil organic matter).
3. Physiographic (slope and aspect of mountain) and Biotic (anthropogenic and non - anthropogenic)
4. Factors Ecological adaptations: hydrophytic, xerophytic, epiphytic and halophytic adaptations.
5. Ecological levels of organization: population, community, ecosystem, landscape, biome and biosphere.

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