B.Sc Life science I (Botany)

Lesson plan 2023-24

Sanjay kumar

Unit		Month
I	Bacteria: Structure, nutrition, reproduction and economic importance. Viruses: General account of Viruse including structure of TMV and Bacteriophages. Algae: General characters, Introductory classification; economic importance; and life cycle (excluding development) of *Nostoc* (Cyanophyceae).*Volvox*, (Chlorophyceae), *Vaucheria* (Xanthophyceae), *Ectocarpus* (Phaeophyceae) and *Polysiphonia* (Rhodophyceae). Fungi: General characters, Introductory classification; economic importance; and life-history of *Phytophthora* (Mastigomycotina), *Penicillium* (Ascomycotina), *Puccinia* (Basidiomycotina), *Colletotrichum* (Deuteromycotina).	AUGUST
II	General account of Lichens, types, ecological and economic importance. Bryophyta: Bryophytes: General characteristics, classification upto classes (Smith, 1935), alternation of generations, structure and reproduction (excluding development) of Marchantia (Hepaticopsida), Anthoceros (Anthocerotopsida), Funaria (Bryopsida), ecological and economic importance of bryophytes.	SEPTEMBER
III	Pteridophyta: General characters, classification upto classes (A. R. Smith, 2006), structure and reproduction (excluding development) of Rhynia (Psilopsida): Structure and	OCTOBER

	reproduction (excluding development) of Selaginella (Lycopsida), Equisetum (Sphenopsida) and Pteris (Pteropsida). heterospory and seed habit, stelar evolution; Ecological andeconomic importance.	
IV	**Gymnosperms:** General characteristics, classification up to classes (Smith 1955), morphology, anatomy and reproduction of *Cycas*, *Pinus*, *Ephedra* (developmental details not to be included); Distribution and economic importance; General account of paleobotany and Geological time scale.	NOVEMBER & DECEMBER

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SEMESTER-III

UNIT- I (JULY-AUGUST)

General characters and diversity of Gymnosperms (seed plants without fruits). Pilger and Melchior's (1954) system of classification.

Geological Time Table; Evolution of Seed Habit.

Palaeobotany-Fossils and Fossilization (Processes involved, types of Fossils and Importance of Fossils; Reconstruction of the following fossil plants:

Lyginopteris

Williamsonia

Cycadeoidea (=Bennettites).

UNIT- II (SEPT-OCTOBER)

Morphology and anatomy of root, stem leaf/leaflet and reproductive parts including mode of reproduction, life-cycle and economic importance of the following:

Cycas

Pinus

Ephedra

General characters of Angiosperms including primitive angiosperms (Amentiferae, Ranales, Magnoliales).

PAPER –II PLANT ANATOMY (NOV-DEC)

UNIT-I

Diversity in plant forms-annuals, biennials and perennials. Tissues-meristematic and permanent (simple and complex).

The Shoot system-shoot apical meristem and its histological organizations (monocot and dicot stem); Cambium-structure and functions.

Secondary growth in dicot stem; characteristics of growth rings; sap wood and heart wood, periderm; Anomalous secondary growth *(Dracaena, Boerhaavia* and *Achyranthes)*

UNIT-II

Leaf-Types of leaves (simple and compound); phyllotaxy.

Epidermis-uniseriate and multiseriate, epidermal appendages and their morphological types.

Anatomy of typical Monocot and Dicot leaf and cell inclusions in leaves; leaf abscission.

Stomatal apparatus and their morphological types.

Root system- the root apical meristem; the histological organization (monocot and dicot root). Secondary growth in dicot root.

Structural modifications in roots- storage *(Beta)*, Respiratory *(Rhizophora)*, Epihytic *(Vanda)*.

B.Sc. III (BOTANY)

LESSON PLAN 2023-2024
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SEMESTER –V

UNIT-I (JULY-AUGUST)

Plant-water Relations**: Importance of water to plant life; physical properties of water; Imbibition, Diffusion, Osmosis and Plasmolysis; absorption and transport of water; transpiration-types, physiology of stomata, factors affecting transpiration, importance of transpiration.**

Mineral Nutrition: **Essential macro and micro elements and their role; mineral uptake; deficiency symptoms.**

Transport of Organic Substances: Mechanism of phloem transport; source-sink relationship; factors affecting translocation.

UNIT-II (SEPT-OCT)

Photosynthesis: **Significance; historical aspects; photosynthetic pigments; action spectra and enhancement effects; concept of two photosystems; Z-scheme; photo-phosphorylation; Calvin cycle; C4 pathway; CAM plants; photorespiration.**

Respiration: **ATP–the biological energy currency; aerobic and anaerobic respiration; Krebs cycle; electron transport mechanism (chemi-osmotic theory); redox - potential; oxidative phosphorylation; pentose phosphate pathway.**

Seed dormancy; plant movements; the concept of photoperiodism; physiology of flowering; florigen concept; physiology of senescence; fruit ripening.

PAPER – II Ecology (NOV-DEC)

UNIT-I

Introduction to Ecology: Definition; scope and importance; levels of organization.

Environment: **Introduction; environmental factors- climatic (water, humidity, wind, light, temperature), edaphic (soil profile, physico-chemical properties), topographic and biotic factors (species interaction).**

Adaptations of plants to water stress and salinity (morphological and anatomical features of hydrophytes, xerophytes and halophytes).

Population Ecology: **Basic concept; characteristics; biotic potential, growth curves; ecotypes and ecads.**

UNIT-II

Community Ecology: **Concepts; characteristics (qualitative and quantitative-analytical and synthetic); methods of analysis; ecological succession.**

Ecosystem: **Structure (components) and functions (trophic levels, food chains, food webs, ecological pyramids and energy flow)**

Biogeochemical Cycles: carbon and nitrogen; hydrological (water) cycle.

Phyto-geography: **Phyto-geographical regions of India; vegetation types of India (forests).**

Environmental Pollution: Sources, types and control of air and water pollution.

Global Change: **Greenhouse effect and greenhouse gases; impacts of global warming; carbon trading.**