D.K.GOVT.COLLEGE FOR WOMEN

(AUTONOMOUS), NELLORE

BOARD OF STUDIES

2019-2020

BOTANY

D K (A) GOVT. DEGREE COLLEGE, NELLORE

I B.Sc - SEMESTER- I: BOTANY THEORY SYLLABUS, ~~2018-19~~ 2018-19.

PAPER- I : MICROBIAL DIVERSITY, ALGAE AND FUNGI & PHYTOPATHOLOGY

Total hours of teaching 60hrs @ 4 hrs per week

UNIT- I: MICROBIAL WORLD - (12hrs)

1.Discovery of microorganisms, **Brief account of** origin of life, spontaneous, biogenesis, Pasteur experiments, g theory of disease.
2.Classification of microorganisms – R.H. Whittaker's five kingdom concept, Carl Woese's- Domain system
3. Brief account of special groups of bacteria- Archaebacteria, Mycoplasma,Actinomycetes

(12hrs)

UNIT- II VIRUSES&: BACTERIA

1. Viruses- Discovery, general account, structure, replication. **Viroids and Prions.**
2.Bacteria, General characteristics, cell structure and nutrition,,Reproduction-
Economic importance of Bacteria.

(12hrs)

UNIT- III: PHYTOPATHOLOGY

1. Symptomology& Disease control
2. Plant diseases caused by viruses– Study of Tobacco Mosaic, Bhendi Vein clearing.
3. Plant diseases caused byBacteria,Citrus canker.
4. Plant diseases caused by Fungi – Tikka disease of Groundnut, Red rot of sugarcane.

(12hrs)

UNIT IV: ALGAE

1. General account - thallus organization
2. Fritsch classification of Algae (up to classes only) and economic importance.
3. Structure, reproduction and life history of *Oedogonium, and Ectocarpus*
4. Cyano bacteria , General account and economic imporatance

(12hrs)

UNIT –V: FUNGI

1. General characteristics and outlines of classification (Ainsworth), Economic Importance of Fungi
2. Structure, reproduction and life history ofAlbugo and *Puccinia* ..
3. Lichens-Structure and economic importance

Suggested activity: Seminar, Quiz, debate, collection of diseased plant parts –studying symptoms and identification of pathogen, collection and study of fresh and marine Algae available in local area.

D.K.Govt. College for Women (A), Nellore
I B. Sc - SEMESTER- II: BOTANY THEORY SYLLABUS,2018-19.
Paper –II : Diversity of Archaegoniates &Plant Anatomy
Total hours of teaching 60hrs @ 4 hrs per week

UNIT – I: BRYOPHYTES **(12hrs)**

1. Bryophytes: General characters, Classification (up to classes)
2. Structure, reproduction and Life history of *Marchantia*, and *Funaria.*
3. Evolution of Sporophyte in Bryophytes.

UNIT - II: PTERIDOPHYTES **(12hrs)**

1. Pteridophytes: General characters, classification (up to Classes)
2. Structure, reproduction and life history of *Lycopodium,* and *Marsilea.*
3. Heterospory and seed habit.
4. Evolution of stele in Pteridophytes.

UNIT – III: GYMNOSPERMS **(12hrs)**

1. Gymnosperms: General characters, classification (up to classes)
2. Morphology, anatomy, reproduction and life history of *Pinus and Gnetum*
3. Economic importance with reference to wood, essential oils and drugs

UNIT –I V: Tissues and Tissue systems **(12hrs)** 1.

Meristems - Root and Shoot apical meristems and their histological organization.
2. Tissues – Meristematic and permanent tissues (simple, complex, secretory)
3. Tissue systems–Epidermal, ground and vascular.

UNIT – V. Secondary growth **(12hrs)**

1. Anomalous secondary growth in *Achyranthes, Boerhaavia* and *Dracaena.*
2. Study of local timbers of economic importance-Teak, Rosewood, Red sanders and Arjun (Tella maddi).

Suggested activity: Collection of *Marsilea* sporocarp, *Pinus* needles, male and female conestudy of *Pinus* pollen grains, collection of locally available economically useful timbers.

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II B. Sc - SEMESTER –III: BOTANY THEORY, 2018-19.

Paper-III : Plant Taxonomy and Embryology)

Total hours of teaching 60hrs @ 4 hrs per week

UNIT – I: INTRODUCTION TO PLANT TAXONOMY (10hrs)

1.Fundamental components of taxonomy : Identification, Nomenclature(ICBN)Types of classification, Author citation, Valid Publication.
2. Taxonomic resources: Herbarium- functions& importance of Herbaria.
3. Botanical Gardens, Flora, Keys- single access and multi-access.

UNIT – II: CLASSIFICATION (10 hrs)

1. Bentham & Hooker's system of classification- merits and demerits.
2. Current concepts in taxonomy – Chemo taxonomy , Numerical taxonomy.
3. Phylogeny – origin and evolution (APG classification).

UNIT –III: SYSTEMATIC TAXONOMY-1 (14 hrs)

Systematic study and economic importance of the following families:
Annonaceae , Brassicaceae , Curcurbitaceae, Apiaceae and Asteraceae.

UNIT –IV: SYSTEMATIC TAXONOMY-2 (14 hrs)

Systematic study and economic importance of the following families:

Asclepiadaceae, Lamiaceae, Euphorbiaceae , Arecaceae and Poaceae

UNIT – V: EMBRYOLOGY (12hrs)

1. Anther structure, microsporogenesis and development of male gametophyte.
2. Ovule structure and types; Megasporogenesis, development & Structure of Embryo sac.[Monosporic Embryosac]
3. Pollination and Fertilization (out lines) Endosperm , . Structure of Dicot and Monocot embryos, Polyembryony.

Suggested activity:

1. Collection of locally available plants of medicinal importance
2. observing pollen grains in Honey.
3. Aero palynology-collection of pollen from air using glycerin strips in different seasons.
4. Field trips for collection of local plants.

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II B.Sc. BOTANY, SEMESTER- IV,2018-19.

THEORY SYLLABUS

PAPER –IV: Plant Physiology and Metabolism

Total hours of teaching 60hrs @ 4 hrs per week

UNIT – I Plant – Water relations (10 hrs)

1. Physical properties of water, and its Importance ,
. Diffusion, Imbibition and Osmosis; concept & components of Water Potential.and
2 Mechanism of Ascent of Sap.
3. Transpiration –Definition, types of Transpiration, structure and opening and closing mechanism of Stomata.

UNIT –II: Mineral nutrition & Enzymes (12 hrs)

1. Mineral Nutrition. Mineral Ion uptake (Active and Passive transport).
2. Nitrogen metabolism- biological nitrogen fixation in *Rhizobium*, outlines of protein synthesis (transcription and translation).
3. Enzymes: General characteristics, mechanism of Enzyme action and factors regulating Enzyme action.

UNIT –III: PHOTOSYNTHESIS (14 hrs)

1. Photosynthesis: Photosynthetic pigments, Photosynthetic Light Phase ,Photophosphorylation
2 Dark Phase.Carbon Assimilation Pathways: C_3, C_4, and CAM
3. Translocation of Organic Solutes: Munchs Mass Flow Hypothesis.

. UNIT – IV: RESPIRATION & PLANT METABOLISM (12 hrs)

1. Aerobic Respiration: Glycolysis, , TCA cycle, Electron Transport System.
2. Anaerobic Respiration

UNIT –V: GROWTH AND DEVELOPMENT (12hrs)

1. Physiological effects of phytohormones - Auxins, Gibberellins, Cytokinins, ABA, Ethylene and Brassinosteroids.
2. Physiology of flowering Plants –Photoperiodism, Phytochrome , Vernalization.

Suggested activity: Seminars, Quiz, Debate, Question and Answer sessions, observing animations of protein biosynthesis in you tube

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III B. Sc - SEMESTER-V:BOTANY THEORY SYLLABUS.2018-19

PAPER-VI: PLANT ECOLOGY& PHYTOGEOGRAPHY

Total hours of teaching 60 hrs @ 3 hrs per week

UNIT – I. Elements of Ecology **(12 hrs)**

1. Ecology: definition, branches and significance of ecology.

2Abiotic Factors: Light, Temperature, : Origin, formation and soil profile only.

3. Biotic Factor: Interactions between plants and animals.

UNIT– II. Ecosystem Ecology **(12 hrs)**

1. Ecosystem: Concept and components, energy flow, Food chain, Food web, Ecological pyramids.
2. Productivity of ecosystem-Primary, Secondary and Net productivity.
3. Biogeochemical cycles- Carbon, Nitrogen and Phosphorous.

UNIT – III Population &Community Ecology **(12 hrs)**

1. Population -definition, characteristics and importance, outlines –ecotypes.
2. Plant communities- characters of a community, outlines – Frequency, density, cover, life forms, competition.

UNIT – IV Phytogeography **(12 hrs)**

1. Principles of Phytogeography, Distribution (wides, endemic, discontinuous species)
2. Phytogeographic regions of India.
3. Endemism – types and causes

UNIT- V: Plant Biodiversity and its importance **(12 hrs)**

1. Definition, levels of biodiversity-genetic, species and ecosystem.
2. Biodiversity hotspots- Criteria, Biodiversity hotspots of India.
3. Loss of biodiversity – causes and conservation (*In-situ* and *ex-situ* methods).
4. Seed banks - conservation of genetic resources and their importance

Suggested activity :Collection of different soils, studying their texture, observing polluted water bodies, student study projects, debates on man's activity on ecosystem and biodiversity conservation methods, visiting a nearest natural vegetation area. Visit to NGO, working in the field of biodiversity and report writing; to study Honey Bees and plants yielding honey.

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III B.Sc.: BOTANY SYLLABUS SEMESTER- VI, 2018-19

Paper VIII, CLUSTER ELECTIVE, Cluster-A,

Paper VIII-A-1: PLANT DIVERSITY AND HUMAN WELFARE

Total hours of teaching 60hrs @ 3hrs per week

Unit- I: Plant diversity and its scope: **(12hrs)**

i. Genetic diversity, Species diversity, Plant diversity at the ecosystem level

Agro biodiversity and cultivated plant taxa, wild taxa.

ii. Values and uses of biodiversity: Ethical and aesthetic values,

iii. Methodologies for valuation, Uses of plants.

Unit -II: Loss of biodiversity: (12hrs)

i. Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity,

Loss of agro biodiversity, projected scenario for biodiversity loss

ii. Management of plant biodiversity: Organizations associated with biodiversity management-Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Biodiversity legislatio and conservations, Biodiversity information management and communication.

Unit-III: Contemporary practices in resource management: **(12hrs)**

i. Environmental Impact Assessment (EIA), Geographical Information System GIS, Participatory resource appraisal, Ecological footprint with emphasis on carbon footprint, Resource accounting;

ii. Solid and liquid waste management

Unit -IV: Conservation of biodiversity **(12hrs)**

i. Conservation of genetic diversity, species diversity and ecosystem diversity, *In situ* and *ex situ* conservation,

ii. Social approaches to conservation, Biodiversity awareness programmes, Sustainable development.

Unit- V: Role of plants in relation to Human Welfare **(12hrs)**

i. Importance of forestry, their utilization and commercial aspects-

a) Avenue trees, b) ornamental plants of India. c) Alcoholic beverages through ages.

ii. Fruits and nuts: Important fruit crops their commercial importance.
Wood, fiber and their uses.

Suggested Readings:

1. Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

Suggested activities:

Study of flora and its diversity in the college campus or local area,enumerating wild and exotic species(*Parthenium*,Water hyacinth etc.)

Project work on any one of the International organizations striving for preservation of biodiversity, study of conservation efforts of local people, and civic bodies, study of locally available fruits in different seasons, enumerating the avenue plantations and their diversity in your town/city