Dr. A.P.J. Abdul Kalam University, Indore

SEMESTER – 1

COURSE	Subject Title	Subject Code
B.Sc. (Major)	Botany-I	BSBY-101T

Course Learning Outcomes (CLO)

By the end of this course the student should have:

- Understood the significance and role of botany.
- Learnt the basic aspects of applied botany.
- Gained knowledge about employment opportunities in the field of botany.
- Gained knowledge about start-up opportunities in the field of botany.
- Learnt about opportunities of social services.
- Gain knowledge about best health practices.

Content

Unit - I

Introduction, objectives and importance of Applied botany

History and evolution of botany

Relation of plants to man and relation with other services

Various disciplines of botany and their applications to human welfare

Unit - II

Definition and types of pollution and pollutants

Phytoremediation: Air, water, soil, noise and thermal pollutants (Any 5 plants with botanical name, family) and their role in pollution control.

Bioremediation: definition and types

Unit - III

Ancient agricultural practices.

Modern agriculture practices: Polyhouse, Drip irrigation, hydroponics, computer-based agriculture ,terrace farming.

Organic farming: Introduction, objective and brief technique.

Horticulture: Definition and role in human welfare

Forestry: Definition, branches and role in human

Silviculture: Definition and management practices

Unit - IV

Role of Botany in Rural development

Ethnobotany: Introduction and importance

Ethnomedicine: Definition and examples. (Local name, Botanical name, family and importance of Neem, Aloe, Clove, Ginger, Tulsi, Turmeric, Giloy, Emblica, Ashwagandha, Arandi)

Ethno-fibres: Definition and examples (Local name, Botanical name, family and importance of Jute Coconut, elephant grass, cotton)

Ethno-food crops: Definition and examples (Local name, Botanical name, family and importance of Garadu, Singada, Kutaki, Sama, Kodo, Bathua, Sehjan, Jowar, Makka, Bajra, Jau)

Unit - V

Plant tissue culture: Definition, types and Importance.

DNA Recombinant technique: Introduction, tools and importance.

Role of recombination in present era

Bioin**formatics:** Definition, concept and tools

Introduction of bioinformatics software: Basic idea of BLAST and FASTA Importance of bioinformatics.

Practical

1. Identification of ethnomedicinal plants

2. Preparation of soil health card of any agricultural field.

3. Study of vermin compost and composting of kitchen waste.

4. Use of BLAST and FASTA

5. Prepare the list of important air, water and soil pollutants of local areas.

6. Plant tissue culture technique: sterilization, inoculation, culture media, acclimatization and hardening,

7. Preparation of list of ethnomedicinal, food, fibre

8. Tools of recombinant DNA technology Restriction, enzymes, plasmid vectors; other enzymes.

9. Study of global warming, acid rain and water quality (pH and Conductivity),

10. Study of local plants grown around agricultural field.

11. *Case and field study can be designed accordingly.

Dr. A.P.J. Abdul Kalam University, Indore

SEMESTER – I

COURSE	Subject Title	Subject Code
B.Sc. (Minor)	Basic Botany	BSBY102T

Course Learning outcomes (CLO)

- This course will help the student to understand the diversity of plants and evolutionary process in plant kingdoms.
- It gives accounts of plant adaptations from aquatic condition to colonize terrestrial habitat.
- The changes in morphological, anatomical and reproductive structures that propel plant evolution can be investigated.
- The economic importance and significance of plants in nature will be understood.
- They will be acquainted with locally prevalent microbial diseases of plants and humans

Content

Unit - I

History of Botany and Indian Contributions.

Morphological Characteristics of lower and higher plants(Angiosperms).

Types of leaves, Inflorescence, Flowers and Fruits,

Structure of Plant cell and cell organelles, Prokaryotic and Eukaryotic Cells, types of Cell division.

Microscope structure and function of light microscope (magnification and resolving power),

Various types of Microscopes: Bright field, Phase Contrast, SEM and TEM.

Unit - II

1. Algae

General characteristics

Range of thallus organization, reproduction.

1.3Types of life-cycles in algae

1.4 Role of algae in nature and its economic importance.

2 Bryophytes:

General characteristics, Ecology.

Range of thallus organization, morphology, anatomy(internal and external features) and reproduction of any one Bryophyte.

Economic importance of Bryophytes

Unit - 3

1 Pteridophytes

General characteristics and morphology.

Stelar organization and reproduction.

Heterospory and seed habit.

Economical importance

2.**Gymnosperms**

General description and their distribution.

Economical importance of Gymnosperms.

3. Paleobotany

Indian contribution in Paleobotany.

Brief knowledge of Fossils and Geological time scale.

Unit - 4

1 Fungi

General characteristics and cell wall composition.

Mode of nutrition

Types of reproduction

Economic importance

Parasexuality and Mycorrhiza

2.**Lichens:** Brief knowledge and their significance.

Unit - 5

Microbes

Brief outline of various types of Microbes

Archaebacteria, Eubacteria, Cyanobacteria, Mycoplasma. Actinomycetes and Virus.

Beneficial and harmful roles.

Practicals

1. Study of various types of leaves, inflorescence, Flowers and fruits.

2. Understanding various parts of Microscope (simple and compound microscope)

3. Study of plant cells (e.g. Onion etc.)

4. Study of permanent slides of Mitosis and meiosis

5. Study of Electron Micrographs of Cell and organelles from Internet, You-Tube.

6. Identification of various algae from specimens, slides and temporary mounts of water from nearby areas like. Nostoc, Oscillatoria, Volvox, Spirogyra, Oedogonium, Chara, and specimens and pictographs of marine algae like Ectocarpus, Sargassum. Polysiphonia

7. Study and identification of some Bryophytes like Riccia Marchantia, Anthoceros, Funuria and Field visit.

8. Study of some fossils (specimens and slides)

9. Study of some Pteridophytes likeLycopodium. Sellaginella, Equisetum. Marselia and study of any one ferm

10. Section cutting of Pteridophytes and Gymnosperms: Stem, root and leaves

11. Specimen study of Pteridophytes and Gymnosperms Cones

12. Study of fugal structures and preparation of temporary mounts of Mucor, Rhizopus. Asperigillus, Yeast, Pencillium, Alternaria, Albugo, Helimenthosporium.

13. Permanent slides of Puccinia on host.

14. Study of various fungal plant diseases

15. Observation of symptoms of virus and bacteria on plants.

16. Gram staining techniques