BHARATHIDASAN UNIVERSITY,TIRUCHIRAPPALLI - 620 024.
CENTRE FOR DISTANCE AND ONLINE EDUCATION

ALLIED BOTANY

(For the candidates admitted from the academic year 2026-2027 onwards)

ALLIED COURSE I
PLANT DIVERSITY, ANATOMY, AND EMBRYOLOGY
(Theory)

COURSE OBJECTIVES:

- To relate major groups of plants and their Characteristics.
- To compare the structural and reproductive stages of major groups of plants with an appropriate type study.
- To categorize the life cycle patterns of major groups of plants.
- To analyze basic principles of anatomy of higher plants.
- To state basic principles of embryology

UNIT – I ALGAE, FUNGI AND LICHENS:

Structure, reproduction and life cycle of the following:

1. Algae: *Oscillatoria, Chlamydomonas, Caulerpa, Sargassum* and *Gracillaria*
2. Fungi: *Penicillium* and *Agaricus*
3. Lichens: Components and types, Structure and reproduction of *Usnea*.

UNIT – II BRYOPHYTES AND PTERIDOPHYTES:

Study of the Structure, reproduction and life cycle of the following:

1. Bryophytes: *Marchantia* and *Funaria*
2. *Pteridophyta*: *Lycopodium* and *Nephrolepis*

UNIT – III GYMNOSPERMS AND PALAEOBOTANY:

1. Gymnosperms: Structure, reproduction and life cycle of *Cycas* and *Gnetum*
2. Palaeobotany: Fossils, Types (compressions, impressions, petrifactions, coal balls)
3. Detailed study of morphology and reproduction in *Rhynia* and *Williamsonia*

UNIT – IV PLANT ANATOMY:

Anatomy: Tissues – Classification of plant tissues - Simple and Complex tissues Anatomy of Dicot and Monocot root, stem and leaf Normal Secondary thickenings: Dicot Stem and Monocot Stem.

UNIT – V PLANT EMBRYOLOGY:

1. Embryology: Mature anther, Microsporangium and male gametophyte.
2. Megasporangium- Types of ovule and Female gametophyte (Polygonum type),
3. Double fertilization, Types of endosperm, Structure and development of dicot embryo.

UNIT - VI CURRENT CONTOURS :(For continuous internal assessment only)

Current developments related to the Plant Diversity, Anatomy and Embryology during the semester concerned to be kept abreast of continuously and cumulatively through collection, discussion and evaluation from news and events over the world collected through multiple reliable informative sources – Research articles, review materials, print, Internet, Interaction, Social media, Webinars and so on.

REFERENCES:

1. Pandey, B.P. (2001). College Botany Vol. I: Algae, Fungi, Lichens, Bacteria, Viruses, Plant Pathology, Industrial Microbiology and Bryophyta. S. Chand & Company Ltd., New Delhi.
2. Sharma, PD (2003). The Fungi. Rastogi Publications, Meerut
3. Gangulee & Khar, 1980. College Botany Vol. I &II Tata McGraw Hill, New Delhi.
4. Vashishta, P.C, Sinha and Anilkumar (2010). Pteridophytes, S.Chand & company Ltd, New Delhi
5. Pandey, S.N., Misra, S.P and Trivedi, P.S. 1970. A text book of Botany (Vol II). Vikas Publishing House Pvt. Ltd. Delhi.
6. Pandey B,P., (2015), Plant Anatomy S. Chand Publ. New delhi.
7. Vashista P.C (1984). Plant Anatomy –Pradeep publication, Jalandhar
8. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms, 5th Edition, Vikas Publishing House. Delhi.
9. Pandey, AK (2000). Introduction to Embryology of Angiosperms 1st Edition: CBS; New Delhi.
10. Kirkaldy, J.E. (1963). The study of Fossils. Hutchinson Educational, London.
11. https://gurukpo.com/Content/B.Sc./Algae_Lichens_and Bryophyta.pdf
12. https://www.austincc.edu/ddingley/MLAB1331/LectureGuide/Mycology.pdf
13. https://bio.libertexts.otg/Bookshelves/Botany/Book%3A_Introduction_to_Botany_(Shipunov)/06%3A_Growing_Diversity_of_Plants/.02%3A_Pteridophyta_-the_Ferns
14. https://www1.biologie.uni-hamburg.de/b-online/palbot/teach/palbotteach.html
15. https://www.google.com/search?q=neela+bakore+reproduction+in+flowering+plants
16. http://virtualplant.ru.ac.za/Main/ANATOMY/prac5.htm

COURSE OUTCOMES:

- Illustrating the features of plant group.
- Get knowledge in plant groups and their features
- Categorize organizational characters and reproductive features of plant groups
- Examine life cycles of different plant groups
- Record understanding on the anatomy of plants
- Apply the fundamental knowledge on the embryology and its applications.

******

ALLIED PRACTICAL I
PLANT DIVERSITY, ANATOMY AND EMBRYOLOGY & TAXONOMY, PHYSIOLOGY, ECOLOGY AND BIOTECHNOLOGY
(Practical)

1. To demonstrate preparations of Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms (mentioned in the syllabus) and to describe and identify the same.
2. To construct micro preparations of the stem, root and leaf of dicot and monocot and to identify the same giving reasons.
3. To prepare suitable micro preparations and detailed microscopic analysis of Dicot Stem Monocot Stem.
4. To record the developmental stages of micro and megasporangia.
5. To analyse the different types of ovules and endosperms
6. To describe the plants in technical terms and to identify the family by the observed morphological characters of vegetative and floral parts.
7. To dissect the flower and to construct the floral diagram.
8. To critically comment the experimental set-ups in plant physiology.
9. To demonstrate the ecological groups of plants (morphological and anatomical adaptations)
10. To apply knowledge in tissue culture techniques (media preparation, callus induction, etc)
11. To employ the tools and techniques in genetic engineering.
12. To manage observation and record note book.

*****

ALLIED COURSE II
TAXONOMY, PHYSIOLOGY, ECOLOGY AND BIOTECHNOLOGY
(Theory)

COURSE OBJECTIVES:

- To state the basic system of classification and salient features of few families.
- To rate the economic significances of some angiosperm plants.
- To describe the physiological principles of plants.
- To operate the basic mechanism involved in biotechnology.
- To recall the basic principles of ecology.

UNIT – I TAXONOMY:

Outline of Bentham and Hooker's system of classification. Study of the following families and economic importance of plants included in the families - Annonaceae, Rutaceae, Fabaceae, Cucurbitaceae.

UNIT – II TAXONOMY:

Rubiaceae, Asclepiadaceae, Lamiaceae, Amaranthaceae, Liliaceae and Poaceae.

UNIT – III PHYSIOLOGY:

Absorption of water, Absorption of minerals, Photosynthesis - Light and dark reaction. Respiration: Aerobic-Glycolysis, kreb's Cycle, Electron Transport System, Anaerobic – fermentation. Growth hormones – Physiological effects and practical applications of Auxin, Gibberellins and cytokinins.

UNIT – IV ECOLOGY:

Basic concepts of Ecosystem Factors affecting Vegetation-Climatic, edaphic and biotic factors. Morphological and anatomical adaptations of - Xerophytes-Nerium and Casuarina. Hydrophytes-Hydrilla and Nymphaea. Mesophytes - Helianthus and Hibiscus.

UNIT – V PLANT BIOTECHNOLOGY:

Tissue culture techniques (Basic principles, Aseptic conditions, Media preparation, Callus induction) Genetic Engineering - Basic principles, tools, techniques and applications Transgenic plants - Bt – Cotton.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Current developments related to the Taxonomy, Physiology, Ecology and Biotechnology during the semester concerned to be kept abreast of continuously and cumulatively through collection, discussion and evaluation from news and events over the world collected through multiple reliable informative sources –

Research articles, review materials, print, Internet, Interaction, Social media, Webinars and so on.

REFERENCES:

1. Pandey, B.P. (1997). Taxonomy of Angiosperms, S. Chand & Co., New Delhi.
2. Sambamurthy A. S. S. 2005; Taxonomy of Angiosperms, I.K. International Pvt. Ltd, New Delhi.
3. 3.Plant Taxonomy (2008)– second Edition by O P Sharma,Mc Graw Hill educatio .
4. 4.Jain, VK (2007). Fundamentals of plant physiology, S. Chand &Compamy ltd, New Delhi.
5. 5.Verma,V (2008).Text book of plant Physiology, Ane's student edition ,New Delhi
6. Plant physiology and development by Lincoln Taiz, Eduardo Zeiger, Ian M. Møller, and Angus Murphy, published by Sinauer Associates
7. Sharma, P.D (2009). Ecology and Environment, Rastogi Publications.
8. Shukla, R.S. &P.S. Chandel (1991): Plant Ecology & Soil Science, S.Chand& Co., New Delhi.
9. Dubey, RC (2004) A text book of Biotechnology - 3rd Edition, S.Chand & Company Ltd, New Delhi.
10. Kumaresan, V, (2009). "Biotechnology", Saras Publications, Nagercoil.
11. http://webapp1.dlib.indiana.edu/inauthors/view?docId=VAC0868&doc.view=print
12. http://www.auburn.edu/academic/classes/biol/1030/rajamani/topic7%20BIOL1030NR.pdf
13. https://www.eeob.iastate.edu/classes/bio366/notes.html
14. https://www.bialigy.com/10-plant-physiology.html
15. https://www.ohio.edu/plantbio/staff/mccarthy/dendro/ecology.htm
16. https://www.agrimoon.com/principles-of-plant-biotechnology-icar-ecourse-pdf/
17. http://www.unice.fr/EB/USTH%202013/BP04_introduction_biotechnology_part_1.pdf

COURSE OUTCOMES:

On the successful completion of the course, the student will be able to:

- Interpret plants based on the features on and off the field.
- Contrast the characters of some dicot and monocot families.
- Measure the concepts of plant functions.
- Recognize an insight on Ecology of plants
- Appraise the fundamental knowledge on plant biotechnology and its applications.

*****