

## ALLIED COURSES

<b>SEMESTER - I PART - III</b>	<b>22UBOTA01: ALLIED BOTANY PAPER – I : PLANT DIVERSITY, ANATOMY, EMBRYOLOGY (OFFERED TO B.SC. ZOOLOGY/ CHEMISTRY/ MICROBIOLOGY)</b>	<b>CREDITS: 4 HOURS: 60</b>
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### COURSE OBJECTIVES:

1. To understand the major groups of plants and their characteristics.
2. To render the structural and reproductive stages of major groups of plants with appropriate type study.
3. To impart the knowledge on the life cycle patterns of major groups of plants.
4. To Gain knowledge about anatomy of stem, root and leaf and their secondary growth.
5. To Grasp the idea of double fertilization, types of endosperms, and dicot embryo development.

### UNIT – I : Algae and Fungi : (15 hours)

Structure, reproduction and life cycle of the following : Algae: *Chlamydomonas*, *Sargassum* and *Gracillaria*; Fungi : *Penicillium* and *Agaricus*.

### UNIT – II : Bryophytes and Pteridophytes : (15 hours)

Study of the Structure, reproduction and life cycle of the following :  
Bryophytes : *Marchantia* and *Funaria* ; Pteridophyta: *Lycopodium* and *Adiantum*.

### UNIT - III : Gymnosperms and Palaeobotany : (10 hours)

Gymnosperms: Structure, reproduction and life cycle of *Pinus* ; Palaeobotany : Fossils, Types (compressions, impressions, petrifications, coal ball Detailed study of morphology and reproduction in *Rhynia*

### UNIT – IV : Plant Anatomy : (10 hours)

Anatomy: Tissues – Classification of plant tissues - Simple and Complex tissues; Anatomy of Dicot and Monocot root, stem and leaf , Secondary growth in Dicot stem and root.

### UNIT – V : Plant Embryology : (10 hours)

Embryology: Mature anther

Megasporangium- Types of Ovule and Female gametophyte (Polygonum type), Double fertilization, Types of endosperm, Structure and development of dicot embryo.

### Text Books:

1. Pandey, B.P. (2001). College Botany Vol. I: Algae, Fungi, Lichens, Bacteria,
2. Viruses, Plant Pathology, Industrial Microbiology and Bryophyta. S. Chand & Company Ltd., New Delhi.
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. Kirkaldy, J.E. (1963). The study of Fossils. Hutchinson Educational, London.
6. Pandey, S.N., Misra, S.P and Trivedi, P.S. 1970. A text book of Botany (Vol II).Vikas Publishing House Pvt. Ltd. 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.

**Course Outcomes :**

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

1. Get knowledge in plant groups and their features
2. Understand the organizational characters and reproductive features of plant groups
3. Identify and have a sound knowledge of the life cycles of different plant groups
4. Possess high understanding on the anatomy of plants
5. Familiar with fundamental knowledge on embryology and its applications.

**OUTCOME MAPPING**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO1</b>	2	3	1	1	2
<b>CO2</b>	2	3	2	2	3
<b>CO3</b>	2	1	3	2	2
<b>CO4</b>	1	3	3	2	1
<b>CO5</b>	2	2	3	3	3

<b>SEMESTER – I &amp; II PART - III</b>	<b>22UBOTAP1: ALLIED BOTANY PRACTICAL I : COVERING ALLIED BOTANY PAPERS I AND II (OFFERED TO B.Sc. ZOOLOGY/ CHEMISTRY/ MICROBIOLOGY)</b>	<b>CREDITS: 3 HOURS: 90</b>
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1. To make suitable micro preparations of Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms (mentioned in the theory syllabus) and to describe and identify the same.
2. To make suitable micro preparations and detailed microscopic analysis of Dicot and Monocot Stem, root and leaf and to identify the same giving reasons.
3. To study the normal secondary thickening in dicot stem and root.
4. To study the internal structure of a mature anther.
5. To study the different types of ovules and endosperms.
6. To describe in technical terms, plants belonging to any of the families prescribed and to identify the family.
7. To dissect a flower, construct floral diagram and write floral formula.
8. Demonstration experiments 1. Ganong's Light screen 2. Ganong's respiroscope.
9. To identify Spotters- Morphology of flowering plants, Taxonomy, Plant Physiology, Plant Biotechnology and Ecology.
10. To maintain observation and record note book.

#### OUTCOME MAPPING

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO1</b>	2	3	1	1	2
<b>CO2</b>	3	3	2	2	3
<b>CO3</b>	2	1	3	2	1
<b>CO4</b>	2	3	3	2	2
<b>CO5</b>	2	2	3	3	3

<b>SEMESTER - II PART-III</b>	<b>22UBOTA02: ALLIED BOTANY PAPER II: MORPHOLOGY, TAXONOMY, PHYSIOLOGY, ECOLOGY AND BIOTECHNOLOGY (OFFERED TO B.Sc. ZOOLOGY/ CHEMISTRY/ MICROBIOLOGY)</b>	<b>CREDITS: 4 HOURS: 60</b>
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**COURSE OBJECTIVES:**

1. To understand external features of plants
2. To familiarize range of characters and economic importance of some families.
3. To know structure of mature anther and types of ovules.
4. To understand physiology mechanisms of plant.
5. To acquire knowledge of ecosystem and environmental pollution..

**UNIT - I : Morphology of flowering plants (10 hours)**

Plant and its parts. Structure and function of root and stem. Leaf and its parts. Inflorescence - Racemose, Cymose, Classification of fruits.

**UNIT – II : Taxonomy (15 hours)**

General outline of Bentham and Hooker's system of classification. Study of the range of characters and plants of economic importance in the following families: Cucurbitaceae, Apocynaceae, Euphorbiaceae and Liliaceae.

**UNIT – III : Plant Physiology (15 hours)**

Absorption of water, photosynthesis - light reaction - Calvin cycle; respiration - Glycolysis - Krebs cycle - electron transport system. Growth hormones - auxins and cytokinins and their applications.

**UNIT – IV : Ecology (10 hours)**

Ecosystem - fresh water ecosystem. Structure and components. Ecological groups of plants : Hydrophytes – *Nymphaea*, Xerophytes – *Nerium*, Mesophytes- *Mangifera* .

**UNIT – V : Plant Biotechnology (10 hours)**

Plant Tissue culture techniques - Basic Principles- aseptic conditions, media preparation, callus induction,. Genetic engineering- Basic principles, tools, techniques and applications, transgenic plants- Bt- brinjal.

**Text Books**

1. Lawrence.G.H.M. 1985. An Introduction to Plant Taxonomy, Central Book Depot, Allahabad.
2. Jain, VK. 2006. Fundamentals of Plant Physiology, S. Chand and Company Ltd.
3. Rajni Gupta. 2012. Plant Taxonomy: Past, Present and Future. Vedams (P) Ltd. New Delhi.
4. Jain, V.K. 2006. Fundamentals of Plant Physiology, S.Chand and Company Ltd., New Delhi.
5. Verma, S.K. 2006. A Textbook of Plant Physiology, S.K.Chand& Co., New Delhi.

**COURSE OUTCOMES :**

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

1. Identify and describe external features of plants
2. Understand range of characters and economic importance of some families.
3. Explain structure of mature anther and types of ovules.
4. Understand functioning of the plant.
5. Analyse functioning of ecosystems and plant adaptations

**OUTCOME MAPPING**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO1</b>	2	3	1	3	2
<b>CO2</b>	2	3	2	2	3
<b>CO3</b>	2	1	3	2	1
<b>CO4</b>	2	3	3	2	3
<b>CO5</b>	2	1	3	1	3