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**KOLHAN UNIVERSITY, CHAIBASA  
JHARKHAND**



**Revised Curriculum and Credit Frame Work  
for SEM - II  
As per FYUGP, NEP-2020  
(U.G. Botany- 2022 Onwards)**

**UNIVERSITY DEPARTMENT OF BOTANY  
KOLHAN UNIVERSITY, CHAIBASA  
WEST SINGHBHUM, JHARKHAND - 833201**

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03/06/2023

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03/06/2023

University Deptt. of Botany  
Kolhan University Chaibasa  
Jharkhand

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**UNIVERSITY DEPARTMENT OF BOTANY**  
**Kolhan University, Chaibasa**

**Four-Year Under Graduate Programme (FYUGP)**

As per Provisions of NEP-2020 to be implemented from Academic Year 2022-23

**COMPOSITIONS OF BOARD OF STUDIES**

1. Dr. Krishna Pyare  
Head, University Deptt. of Botany  
Kolhan University, Chaibasa

*Dr. Krishna Pyare*  
03/06/2023

2. Dr. Salomy Kujur  
Assistant Professor  
University Deptt. of Botany  
Jamshedpur Women's University, JSR

3. Mrs. Pushpa Salo Linda  
Assistant Professor  
Department of Botany  
Jamshedpur Worker's College, JSR

*Dr. Salomy Kujur*  
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4. Dr. Vishnu Shankar Sinha  
Assistant Professor  
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Tata College, Chaibasa

5. Dr. Dara Singh Gupta  
Assistant Professor  
University Deptt. of Botany  
Kolhan University, Chaibasa

*Dr. Dara Singh Gupta*  
03/06/2023

*Dr. Krishna Pyare*  
03/06/2023  
(Dr. Krishna Pyare)  
Chairman & Head, Head  
University Deptt. of Botany, University Deptt. of Botany  
Kolhan University, Chaibasa, Kolhan University, Chaibasa  
Jharkhand

## SEMESTER - II

Paper Title – Major Paper 2 (MJ-2)  
CREDIT-04 [THEORY- 03 + PRACTICAL- 01]

### Mycology & Phytopathology

#### Course Outcomes: ---

On completion of this course, the students will be able to;

1. Identify true fungi and demonstrate the principles and application of plant pathology in the control of plant disease.
2. Develop an understanding of microbes, fungi and lichens and appreciate their adaptive strategies.
3. Identify the common plant diseases according to geographical locations and device control measures .
4. Understand the economic and pathological importance of fungi, bacteria , and viruses .

Full Mark - 60

Time: - 3 Hrs

#### Unit I: Introduction to fungi and classification

10 lectures

Introduction – General characters, ecology and significance ,range of thallus organization ,nutrition ,reproduction and classification ( Alexopolus). Economic Importance of fungi.

#### Unit II: True Fungi

10 lectures

General characteristics; ecology significance and Life cycle of *Rhizopus* , *peziza* , *puccinia* , & *Cercospora*.

#### Unit III: Symbiotic associations

10 lectures

Lichen – Occurrence; General characteristics; Growth forms and range of thallus organization; Economic importance of Lichen; Mycorrhiza- Ectomycorrhiza, Endomycorrhiza and their significance.

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## Unit IV: Phytopathology

15 lectures

Terms and concepts; General symptoms; Geographical distribution of diseases; Etiology; Symptomology; Host-Pathogen relationships; Disease cycle and environmental relation; prevention and control of plant diseases, and role of quarantine. Bacterial diseases – Citrus canker and angular leaf spot of cotton. Viral diseases – Tobacco Mosaic viruses, vein clearing. Fungal diseases – Early blight of potato, Black stem rust of wheat, White rust of crucifers.

**Sessional Internal Assessment (SIA) Full Marks -15 Marks**

**A –Internal Written Examination – 10 Marks ( 1 Hrs.)**

**B - Overall performance including regularity – 05 Marks**

### Suggested Readings:-

1. Agrios, G.N. (1997). Plant Pathology, 4th edition, Academic Press, U.K.
2. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology. 4th edition. John Wiley & Sons (Asia) Singapore.
3. Webster, J. and Weber, R. (2007). Introduction to Fungi. 3rd edition. Cambridge University Press, Cambridge.
4. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi and Their Allies, Macmillan Publishers India Ltd. 5. Sharma, P.D. (2011). Plant Pathology, Rastogi Publication, Meerut, India.

**Paper Title – Major Paper 3 (MJ-3)**

**CREDIT-04 [THEORY- 03 + PRACTICAL- 01]**

**Bryophytes & Pteridophytes**

### Course outcomes :---

On completion of this course, the students will be able to:

1. Demonstrate an understanding of Bryophytes and Pteridophytes (Archegoniate).
2. Develop critical understanding on morphology, anatomy and reproduction of Bryophytes and Pteridophytes .

3. Understanding of plant evolution and their transition to land habitat.
4. Demonstrate proficiency in the experimental techniques and methods of appropriate analysis of Bryophytes and Pteridophytes.

**Full Mark - 60**

**Time: - 3 Hrs**

### **Unit I: Bryophytes**

**20 lectures**

General characteristics; Adaptations to land habit; Classification (up to family); Range of thallus organization. Morphology, anatomy, reproduction and evolutionary trends in Riccia, Marchantia, Anthoceros, Sphagnum and Funaria; Progressive sterilization of Bryophytes. ecological and economic importance with special reference to Sphagnum.

### **Unit II: Pteridophytes**

**25 lectures**

General characteristics; Classification (up to family); General account of early land plants. Morphology, anatomy and reproduction of Psilotum, Selaginella, Equisetum and Pteris (Developmental details not to be included). Apogamy and apospory, heterospory and seed habit, telome theory, stellar evolution; Common ferns of India, Ecological and economic importance.

**Sessional Internal Assessment (SIA) Full Marks -15 Marks**

**A –Internal Written Examination – 10 Marks ( 1 Hrs.)**

**B - Overall performance including regularity – 05 Marks**

### **Suggested Readings:-**

1. Vashistha, P.C., Sinha, A.K., Kumar, A. (2010). Pteridophyta. S. Chand. Delhi, India.
2. Parihar, N.S. (1991). An introduction to Embryophyta: Vol. I. Bryophyta. Central Book Depot, Allahabad.
3. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology. Tata McGraw Hill, New Delhi.
4. Vanderpoorten, A. and Goffinet, B. (2009). Introduction to Bryophytes. Cambridge University Press, Cambridge.

**Semester – II**

**Paper Title – Botany Practical Based on – MJ-2 and MJ-3**  
**Credits – 02**

**Time- 3 Hrs**

**Full Marks – 50**

**Pass Marks - 20**

**Group- “A” Based on MJ-2**

Introduction to the world of fungi (Unicellular, coenocytic/septate mycelium, ascocarps & basidiocarps).

1. *Rhizopus*: study of asexual stage from temporary mounts and sexual structures through permanent slides.
2. *Aspergillus* and *Penicillium*: study of asexual stage from temporary mounts. Study of Sexual stage from permanent slides/photographs.
3. *Peziza*: sectioning through ascocarp.
4. *Alternaria*: Specimens/photographs and temporary mounts.
5. *Puccinia*: Herbarium specimens of Black Stem Rust of Wheat and infected Barberry leaves; sections/ mounts of spores on wheat and permanent slides of both the hosts.
6. *Agaricus*: Specimens of button stage and full grown mushroom; sectioning of gills of *Agaricus*, fairy rings and bioluminescent mushrooms to be shown.
7. *Albugo*: Study of symptoms of plants infected with *Albugo*; asexual phase study through section/temporary mounts and sexual structures through permanent slides.
8. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose) on different substrates. Study of thallus and reproductive structures (soredia and apothecium) through permanent slides. Mycorrhizae: ectomycorrhiza and endomycorrhiza (Photographs).
9. Phytopathology: Herbarium specimens of bacterial diseases; Citrus Canker; Angular leaf spot of cotton, Viral diseases: TMV, Vein clearing, Fungal diseases: Early blight of potato, Black stem rust of wheat and White rust of crucifers.

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03/06/2023  
Head

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## Group – “ B’ Based on MJ-3

1. *Riccia* – Morphology and Anatomy of thallus.
2. *Marchantia*- Morphology and Anatomy of thallus, whole mount of rhizoids and Scales, vertical section of thallus through Gemma cup (all temporary slides), vertical section of Antheridiophore, Archegoniophore, longitudinal section of Sporophyte (all permanent slides).
3. *Anthoceros*- Morphology of thallus, dissection of sporophyte (to show stomata, spores, pseudoelaters, columella) (temporary slide), vertical section of thallus (permanent slide).
4. *Sphagnum*- Morphology of plant, whole mount of leaf (permanent slide only)
5. *Funaria*- Morphology, whole mount of leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, longitudinal section of capsule; whole mount of protonema.
6. *Psilotum*- Study of specimen, transverse section of synangium (permanent slide).
7. *Selaginella*- Morphology, whole mount of leaf with ligule, transverse section of stem, whole mount of strobilus, whole mount of microsporophyll and megasporophyll (temporary slides), longitudinal section of strobilus (permanent slide).
8. *Equisetum*- Morphology, transverse section of internode, longitudinal section of strobilus, whole mount of sporangiophore, whole mount of spores (temporary slide), transverse section of rhizome (permanent slide).
9. *Pteris*- Morphology, transverse section of rachis, transverse section of sporophyll through sorous, whole mount of sporangium, whole mount of spores (temporary slides), transverse section of rhizome, whole mount of prothallus with sex organs and young sporophyte (permanent slide).

**Experiments – 30 Marks**

**Viva Voice –10 Mark**

**Practical Records – 10 Mark**