

KOLHAN UNIVERSITY, CHAIBASA JHARKHAND



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

**UNIVERSITY DEPARTMENT OF BOTANY
KOLHAN UNIVERSITY, CHAIBASA
WEST SINGHBHUM, JHARKHAND – 833202**

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

2. Dr. Salomi 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

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Assistant Professor
Department of Botany
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5. Dr. Dara Singh Gupta

Assistant Professor
University Deptt. of Botany
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(Dr. Krishna Pyare)
Chairman & Head,
University Deptt. of Botany
Kolhan University, Chaibasa

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Sem	Code	Papers	Credits (Th +P)
I	MJ-1	Major Paper -1 Microbiology & Phycology	3+1
	MN-1A	Minor Paper- 1 Plant Ecology and Taxonomy	3+1

- **For End Semester Examination (ESE 60 Marks , 3 Hrs Exam) :**

There will be **two** group of question. **Group A is compulsory** which will **contain** three questions. **Question No. 1 will be very short answer types** consisting of five questions of 1 mark each. **Question No. 2 & 3 will be short answer type** of 5 marks each. **Group B will contain descriptive type** five questions of fifteen marks (15) each, out of which any three are to answer.

- **For End Semester Examination (ESE 75 Marks , 3 Hrs Exam) :**

There will be **two** group of question. **Group A is compulsory** which will contain three questions. **Question No. 1 will be very short answer type** consisting of five questions of 1 mark each. **Question No. 2 & 3 will be short answer type** of 5 marks each. **Group B will contain descriptive type** six questions of fifteen marks (15) each, out of which any four are to answer.

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

Microbiology and Phycology

Course Outcomes: ---

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

1. General characteristics, structure and replication of Viruses.
2. Examine the general characteristics of bacteria and their cell reproduction/ Recombination.
3. To understand detail information of different classes of Algae like Cyanophyta, Chlorophyta, Xanthophyta, Phaeophyta and Rhodophyta.
4. Commercial cultivation and their economic importance of algae.

Full Mark - 60

Time: - 3 Hrs

Unit I: Viruses and Bacteria

15 Hrs

General characteristics; classification (Baltimore), structure and replication of DNA virus (T4 phage), lytic and lysogenic cycle; RNA virus (TMV), General characteristics of bacteria, Cell structure; Reproduction and recombination (conjugation, transformation and transduction).

Unit II: Algae, Cyanophyta and Xanthophyta

15 Hrs

Characteristic features of Algae & its Classification (by Fritsch), Ranges of thallus organization in Cyanophyta and Xanthophyta. Cell structure and Reproduction of *Spirulina*, *Nostoc* & *Voucheria*.

Unit III: Chlorophyta and Phaeophyta and Rhodophyta

15 Hrs

General characteristics features of Chlorophyta, Pheaophyta and Rhodophyta; Occurrence & Range of thallus organization of Chlorophyta, Pheaophyta and Rhodophyta. Structure and Reproduction in *Volvox*, *Oedogonium*, *Chara*, *Ectocarpus* and *Polysiphonia*. Commercial cultivation and economic importance of green algae, red algae and brown algae.

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. Lee, R.E. (2008). Phycology, Cambridge University Press, Cambridge. 4th edition.
2. Wiley, J.M, Sherwood, L.M. and Woolverton, C.J. (2013). Prescott's Microbiology. 9th Edition. McGraw Hill International.
3. Vashishta B.R., Sinha A.K. and Singh V. P. (2008). Botany for Degree Students. Algae. S Chand and Co, New Delhi.
4. Sharma T.A., Dubey, R.C. And Maheshwari, D.K. (1999). A Text Book of Microbiology. S Chand and Co, New Delhi.
5. Sahoo, D. (2000). Farming the ocean: seaweeds cultivation and utilization. Aravali International, New Delhi.
6. Campbell, N.A., Reece, J.B., Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky P.V. and Jackson, R.B. (2008). Biology, 8th edition. Pearson Benjamin Cummings, USA..
7. Pelczar, M.J. (2001). Microbiology, 5th edition, Tata McGraw-Hill Co, New Delhi

Semester – I

Paper Title – Botany Practical – MJ-I Lab

Credits – 01

Full Marks – 25

Pass Marks - 10

Microbiology

1. Electron micrographs/Models of viruses – T4 and TMV, Line drawings/ Photographs of Lytic and Lysogenic Cycle.
2. Types of Bacteria from temporary/permanent slides/photographs. Water bloom. Electron Micrographs or charts of bacteria, binary fission, endospore, conjugation.
3. Gram-staining of root nodule and curd.

Phycology

1. Microscopic observation of vegetative and reproductive structures of Nostoc, *Volvox*, *Oedogonium*, *Chara*, *Vaucheria*, *Ectocarpus*, and *Polysiphonia*.

Experiments – 15 Marks

Viva Voice – 05 Mark

Practical Records – 05 Mark

SEMESTER - I
Paper Title – Minor Paper – I (MN-I A)
CREDIT-04 [THEORY- 03 + PRACTICAL- 01]
PLANT ECOLOGY AND TAXONOMY

Course Outcomes: ---

At the end of the course the students will be able to;

1. Comprehend the basic concepts of plant ecology, taxonomy and botanical
2. nomenclature
3. Analyze the characteristics of different plant communities.
4. Examine the structure and functions of eco-system.
5. Evaluate the significance of herbarium
6. Analyze the implications of biometrics, numerical taxonomy and cladistics.

Full Mark - 60

Time: - 3 Hrs

Unit I: --- Introduction, Factors, Communities and Ecosystem

15 Hrs

Soil: Origin, formation, composition, soil profile. Water:--States of water in the environment
Adaptation of hydrophytes and xerophytes. Succession: processes and types. Structure, trophic
organization; energy flow; food chains and food web. Ecological pyramids. Gross and net
productivity. Biogeochemical cycles of carbon and nitrogen.

Unit II: --- Phyto geography, Introduction to Plant Taxonomy

20 Hrs

Biogeographical zones and Endemism. Plant Taxonomy: -- Description, Identification,
Nomenclature and Classification. Importance of Herbarium, important herbaria and botanical
gardens of the world and India. Ranks, categories and taxonomic groups, Principles and rules of
International Code of Nomenclature (ICN), binominal system, Typification, author citation, valid
publication, rejection of names, principle of priority and its limitations.

Unit III: --- Classification, Biometrics, Numerical Taxonomy and Cladistics

10 Hrs

Types of classification-artificial, natural and phylogenetic. Bentham and Hooker (upto series),
Takhtajan (upto superorder). Characters; variations; OTUs, character weighting and coding;
cluster analysis; phenograms.

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. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4 edition. Hall, U.S.A.
2. Sharma, P.D. (2010). Ecology and Environment. Rastogi Publications, Meerut, India.
3. Singh, J.S., Singh, S.P. and Gupta, S. (2006). Ecology Environment and Resource Conservation. Anamaya Publications, New Delhi, India.
4. Ambasht R. S. and Ambasht P. K. (1999) Environment and Pollution. C. B. S. Publishers & Distributers, New Delhi.
5. Dash, M. C. (2007). Fundamentals of Ecology. Tata Mc Graw Hill Publishing Company Limited.
6. Verma, P.S. and Agrawal, V. K. (2010). Environmental Biology. S. Chand and Company Ltd., New Delhi.
7. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.
8. Singh, G. (2012). Plant Systematics: Theory and Practice. 3rd edition. Oxford & IBH Pvt. Ltd., NewDelhi.
9. Sambamurty A.V.S.S. (2005). Taxonomy of Angiosperms. I. K. International Pvt. Ltd., New Delhi. 10. Singh M. P. & Abbas S. G. Essentials of Plant Taxonomy and Ecology. Daya Publishing House, New Delhi.
11. Singh, V., Pande, P. C. & Jain, D. K. (2008). Taxonomy and Economic Botany. Rastogi Publications, Meerut.
12. Pandey, B. P. (2009). A Textbook of Botany Angiosperms. . S. Chand and Company Ltd., New Delhi.

Semester – I
Paper Title – Botany Practical – MN-I Lab
Credits – 01

Full Marks – 25

Pass Marks - 10

1. Determination of pH and analysis of two soil samples for carbonates chlorides, nitrates, a. sulphates, organic matter and base deficiency by rapid field test.
2. Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.
3. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each).
4. (b) Study of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite a. (*Orobancha*), Epiphytes.
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method (species to be listed)
6. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law
7. Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification): Brassicaceae – *Brassica*; Asteraceae – *Ageratum*, *Eclipta* and *Tridax*; Solanaceae -*Solanum nigrum*, ; Lamiaceae - *Ocimum*; Liliaceae - *Lilium* and *Allium*.
8. Mounting of a properly dried and pressed specimen of any wild plants with herbarium label

Experiments – 15 Marks

Viva Voice – 05 Mark

Practical Records – 05 Marks