

# Department Of Botany

## South East Manipur College Komlathabi, Manipur

### COURSE OBJECTIVES AND LEARNING OUTCOMES OF NEP 2020 SYLLABUS

The B.Sc. Botany Honours course for NEP 2020 have distinct and visionary objectives vis-à-vis its proficient outcomes and modern technological applicability to enhance quality of life and overall natural environment by promulgating young ignited minds about the very basic structural and morphological characters to the level of molecular organisation and phenomenon for all diverse form of plants so as to enable them to understand deeply about the role of plants in this living world which make this earth vital and viable for all forms of life through the law of interdependence of ecosystem in which plants play major roles to mediate the natural linkage of environment and the living world thus forming the 'biosphere' to make life possible on this earth. Some very brief but a complete highlights of objectives and outcomes are given below.

#### COURSE OBJECTIVES

1. To gain knowledge of diversity, life forms, life cycles, morphology and importance of viruses, bacteria, fungi and to introduce students about the concepts and principles of plant pathology, causal organisms of plant diseases and their control.
2. To gain knowledge of diversity, life forms, life cycles, morphology and importance of algae, bryophytes, pteridophytes and gymnosperms along with proficiency in the experimental techniques of analysis of these plant groups.
3. To enable students to understand and appreciate the relevance of Microbes and Plants to environment and sustainable development.
4. To develop an understanding of Evolution of Plant forms and the consequent Biodiversity developed. These are instrumental in creating awareness on the threats to biodiversity and sensitize students towards the Conservation of Biodiversity for sustainable development.
5. To help the students to gain knowledge on the activities in which the giant molecules and miniscule structures that inhabit the cellular world of life are engaged. This will provide inside into the organization of cell, its features and regulation at different 4 levels. Through the study of biomolecules and cell organelles, they will be able to understand the various metabolic processes such as respiration, photosynthesis etc. which are important for life.
6. To introduce students to application of microbes and plants in Industrial application and Environmental remediation strategies.
7. To explore the natural genetic variation in plants and to understand how diverse factors (at the cellular level) contribute to the expression of genotypes and hence to phenotypic variation.
8. To provide insight of physiological and biochemical processes in the plant systems with emphasis on different pathways, regulation and integration of metabolic

processes with their role in crop productivity, and understanding of metabolic engineering.

9. To make the students familiar with economic importance of diverse plants that offer resources to human life and to emphasize the use of plants as food, medicine and for other utilities with huge economic value etc.

10. To give students knowledge on classical and modern plant biotechnology processes, role of biotechnology on global food security and commercial gains in biotechnology and agriculture, and also to familiarize with biotechnological tools

11. To understand biotechnological processes and its applicative value in pharmaceuticals, food industry, agriculture, ecology to modify plant responses and properties for global food security, human welfare and conservation of biodiversity.

12. Understanding of plant classification systematics, evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics and molecular biology of various plants groups.

13. Understanding of various analytical techniques of plant sciences, use of plants as industrial resources or as human livelihood support system and the use of transgenic technologies for basic and applied research in plants.

14. Understanding of various life forms of plants, morphology, anatomy, reproduction, genetics, microbiology, molecular biology, recombinant DNA technology, transgenic technology and use of bioinformatics tools and databases and in the application of statistics to biological data

15. To provide new information, enhance core competency and discovery/inquiry based learning of learners. A botany graduate would be competent in the field to undertake further discipline-specific studies, as well as to begin domain-related employment.

16. To make students aware of most basic domain-independent knowledge, including critical thinking and communication.

17. To enable the graduate to prepare for national and International competitive examinations for employment.

#### **COURSE OUTCOMES**

**1. Core competency:** Students will acquire core competency in the subject Botany, and in allied subject areas.

The student will be able to identify major groups of plants and compare the characteristics of lower (e.g. algae and fungi) and higher (angiosperms and gymnosperms) plants.

- Students will be able to use the evidence based comparative botany approach to explain the evolution of organism and understand the genetic diversity on the earth.
- The students will be able to explain various plant processes and functions, metabolism, concepts of gene, genome and how organism's function is influenced at the cell, tissue and organ level.
- Students will be able to understand adaptation, development and behaviour of different forms of life.
- The understanding of networked life on earth and tracing the energy pyramids

through nutrient flow is expected from the students.

- Students will be able to demonstrate the experimental techniques and methods of their area of specialization in Botany.

**2. Analytical ability:** The students will be able to demonstrate the knowledge in understanding research and addressing practical problems.

Application of various scientific methods to address different questions by formulating the hypothesis, data collection and critically analyze the data to decipher the degree to which their scientific work supports their hypothesis.

**3. Critical Thinking and problem solving ability:** An increased understanding of fundamental concepts and their applications of scientific principles is expected at the end of this course. Students will become critical thinker and acquire problem solving capabilities. • Digitally equipped: Students will acquire digital skills and integrate the fundamental concepts with modern tools.

**4. Ethical and Psychological strengthening:** Students will also strengthen their ethical and moral values and shall be able to deal with psychological weaknesses.

**5. Team Player:** Students will learn team workmanship in order to serve efficiently institutions, industry and society.

**6. Independent Learner:** Apart from the subject specific skills, generic skills, especially in botany, the program outcome would lead to gain knowledge and skills for further higher studies, competitive examinations and employment. Learning outcomes based curriculum would ensure equal academic standards across the country and broader picture of their competencies. The Bachelor program in Botany and Botany honours may be mono-disciplinary or multidisciplinary.

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12/4/24

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