

BOTANY

Course Outcome

Semester I

Course: MJC-I (T): Phycology and Microbiology

Course Outcomes:

1. Classify the plant kingdom
2. Describe the diversity, structure and importance of viruses and bacteria
3. Describe the general account of mycoplasma
4. Explain the thallus organization, economic importance and the life cycle of various algae

Semester II

Course: MJC-2 (T): Biomolecules and Cell Biology

Course Outcomes:

1. Describe the structure, properties and functions of biomolecules
2. Explain the classification, properties and functions of enzymes
3. Describe cell wall, cell membrane, and the structure and functions of cellular organelles
4. Explain the eukaryotic cell cycle, mitosis, and meiosis

Semester III

Course 1: MJC-3 (T): Mycology and Phytopathology

Course Outcomes:

1. Understand thallus organization, nutrition, economic importance, and life cycle of fungi
2. Understand terms, scope, and importance of plant pathology
3. Describe etiology, symptoms, and control measures of plant diseases
4. Understand associations such as lichens and mycorrhizae

Course 2: MJC-4 (T): Archegoniate

Course Outcomes:

1. Understand morphology, diversity, and evolution of bryophytes, pteridophytes, and gymnosperms
2. Compare life cycles of these plant groups
3. Understand their economic importance
4. Appreciate the importance of studying fossils

Semester IV

Course 1: MJC-5 (T): Morphology and Anatomy

Course Outcomes:

1. Know morphological characters of plants
2. Understand tissue systems and normal/anomalous secondary growth
3. Learn structural adaptations in different environments
4. Describe the structure and function of periderm

Course 2: MJC-6 (T): Economic Botany

Course Outcomes:

1. Identify economically important plants
2. Understand their distribution patterns
3. Acquire skill in medicinal plant identification
4. Learn about cultivation and uses

Course 3: MJC-7 (T): Genetics

Course Outcomes:

1. Understand Mendelian laws and their variations
2. Understand chromosomal abnormalities and genetic disorders
3. Understand mutations and their significance
4. Understand sex determination and inheritance



Semester V

Course 1: MJC-8 (T): Molecular Biology

Course Outcomes:

1. Understand structure and role of DNA and RNA
2. Learn transcription and translation mechanisms
3. Understand gene regulation
4. Understand modern biological techniques

Course 2: MJC-9 (T): Plant Ecology and Phytogeography

Course Outcomes:

1. Understand plant communities and adaptations
2. Learn about soil properties and pollution
3. Understand biodiversity conservation
4. Understand phytogeography and ecological concerns



Semester VI

Course 1: MJC-10 (T): Plant Systematics

Course Outcomes: *Classification, taxonomy, and identification skills*

Course 2: MJC-11 (T): Reproductive Biology of Angiosperms

Course Outcomes: *(Not explicitly listed; typically includes floral biology, pollination mechanisms, etc.)*

Course 3: MJC-12 (T): Plant Physiology

Course Outcomes: *(Not explicitly listed; typically includes physiological processes like photosynthesis, respiration, etc.)*

Semester VII

Course: MJC-13 to MJC-15

Courses include: Plant Metabolism, Research Methodology, Recombinant DNA Technology & Plant Biotechnology

Course Outcomes:

- Advanced understanding of metabolism and molecular biology
- Research design and scientific writing
- Techniques in biotechnology and genetic engineering

Semester VIII

Course: MJC-16 & Research Project

Course Outcomes:

- Gain practical and theoretical knowledge in **Horticultural Practices and Post-Harvest Management**
- Ability to conduct and present **independent research**

Programme Outcome (PO) for B.Sc. (Hons.) in Botany

The **Bachelor of Science (Hons.) in Botany** program aims to develop foundational to advanced knowledge in plant sciences with an emphasis on biological diversity, structure, functions, ecology, evolution, biotechnology, and economic importance of plants. On successful completion of the program, students will be able to:

PO1: Fundamental Knowledge

Acquire a strong conceptual foundation in core areas of Botany including microbiology, phycology, mycology, plant anatomy, systematics, ecology, physiology, genetics, and molecular biology.

PO2: Analytical and Laboratory Skills

Develop proficiency in laboratory techniques for plant identification, microscopy, physiology, genetics, and biotechnology, along with the ability to interpret experimental data critically.

PO3: Scientific Inquiry and Research

Understand the principles of scientific investigation and gain experience in formulating hypotheses, designing experiments, and presenting research through a capstone dissertation or project.

PO4: Application of Knowledge

Apply botanical knowledge in areas such as agriculture, horticulture, environmental management, plant pathology, biodiversity conservation, and sustainable development.

PO5: Environmental and Ecological Awareness

Evaluate ecological processes, environmental issues, and the impact of human activities on biodiversity and ecosystems with a scientific and ethical approach.

PO6: Biotechnology and Innovation

Gain insights into molecular tools and biotechnological applications in plant sciences, preparing students for industrial, academic, or entrepreneurial ventures.

PO7: Communication and Scientific Literacy

Develop the ability to effectively communicate biological concepts, experimental results, and scientific information in written, oral, and visual formats.

PO8: Ethics, Responsibility, and Teamwork

Inculcate values of scientific integrity, professional ethics, and the ability to work independently as well as collaboratively in diverse teams.

PO9: Career and Entrepreneurship Readiness

Prepare for employment in education, research, environmental consultancy, agriculture, horticulture, biotechnology, and allied sectors or for pursuing higher studies like M.Sc., B.Ed., or competitive exams.

PO10: Lifelong Learning

Cultivate an inquisitive attitude for lifelong learning and staying updated with scientific advancements and global environmental challenges.

Crosscutting Issues in the Botany Curriculum

The B.Sc. (Hons.) in Botany program integrates several **crosscutting themes** into its curriculum to ensure holistic development of students. These themes promote responsible citizenship, ethical conduct, environmental consciousness, and social sensitivity, aligning education with real-world challenges and societal needs.

□ 1. Professional Ethics

Integrated Through:

- **Research Methodology (Semester VII):** Students learn about ethical considerations in scientific research including data integrity, plagiarism, and citation ethics.
- **Genetics & Molecular Biology (Semester IV & V):** Ethical issues related to genetic engineering, cloning, GMOs are discussed.
- **Dissertation/Research Project (Semester VIII):** Reinforces academic honesty, transparency, and responsible conduct in research.

Outcomes:

- Cultivates integrity, responsibility, and respect for scientific contributions.
- Promotes adherence to bioethical standards in research and biotechnology.



2. Gender Sensitivity

Integrated Through:

- **Reproductive Biology of Angiosperms (Semester VI):** Discussion of reproductive mechanisms that indirectly introduces concepts of biological diversity, including sexual and asexual reproduction.
- **Seminar & Group Projects (Multiple Semesters):** Mixed-gender collaborative work fosters mutual respect, inclusion, and equality.

Outcomes:

- Encourages equitable participation in academic settings.
- Sensitizes students to gender roles and biases, promoting inclusiveness in science and society.



3. Human Values

Integrated Through:

- **Value-Added Courses & Extension Activities (NCC/NSS/NGO Involvement):** Embedded in multiple semesters as part of skill enhancement and community engagement.
- **Plant Ecology and Biodiversity (Semester V):** Emphasizes the interdependence of human and natural systems, nurturing empathy and a sense of responsibility.

Outcomes:

- Fosters compassion, cooperation, respect, and civic responsibility.
- Promotes an attitude of service, cultural appreciation, and ethical decision-making.

4. Environment and Sustainability

Integrated Through:

- **Environmental Science (AEC-2, Semester II):** Dedicated course focusing on environmental issues, conservation, pollution, and sustainability strategies.
- **Plant Ecology and Phytogeography (Semester V):** Discusses climate change, biogeochemical cycles, conservation strategies, and phytogeographical patterns.
- **Economic Botany and Horticulture (Semesters IV & VIII):** Promotes sustainable agricultural and post-harvest practices.

Outcomes:

- Enhances environmental awareness and action-oriented knowledge.
- Equips students to contribute meaningfully to sustainable development and biodiversity conservation.

Conclusion

By weaving these crosscutting themes across semesters, the curriculum nurtures **socially responsible, ethically sound, and environmentally aware graduates** who are not only competent botanists but also **informed global citizens**.