

MATA GUJRI MAHILA MAHAVIDYALAYA (AUTONOMOUS), JABALPUR

PROGRAM EDUCATIONAL OBJECTIVES (PEOS), PROGRAM OUTCOMES (POS) & PROGRAM SPECIFIC OUTCOMES (PSOS)

Department of Botany

M.Sc in Botany

Vision

To be a centre of excellence for plant and microbial sciences in order to explore and conserve them for the sustainable development.

Mission

To generate knowledge by providing a student centered and professional oriented higher education to produce postgraduates and researchers in various fields of plant sciences capable of providing fruitful solutions to industrial, health, agricultural and environmental challenges.

Program Objectives

PO1.Critical Thinking: The curriculum is designed for the betterment of the students, to enhance the ability and thinking power towards conservation of mother nature.

PO2. Effective Communication: Classes are held in respective English and Hindi medium so students have confidence and communicate in the same.

PO3.Social Interaction: Due to continuous field visits to different institutes, field visits etc students interact and communicate with the native community for their study.

PO4.Effective Citizenship: Being the botanist students learn about the importance of different plant species, their habitat and intern help in their conservation.

PO5.Ethics: The subject motivates students about the ethical approach towards the mother nature, how to conserve it and not to destroy the ecosystem.

PO6.Environment and Sustainability: Different modes of conservation practices are studied for sustainable development of the natural resources for the benefit of the society as a whole.

PO7.Self-directed and Life-long Learning: All the topics covered in the programme teaches life long learning useful in different fields.

PO8. Empowering: The students learn mushroom cultivation etc which creates the opportunity of self employment and also they also acquaint by various biotechniques required in research.

The Programme Outcomes

- The course is designed to provide an adequate knowledge about basic concept of different plant groups such as Bryophytes, Pteridophytes, Gymnosperms, Angiosperms , hydrophytes etc and their phylogenetic relationship.
- Students are expected to familiarize with the morphological and systematic knowledge about different plant groups. They will be able to make use of this knowledge for detailed study in other disciplines.
- The course is designed to provide an adequate knowledge of all the microorganisms and their industrial applications, about basic microbial techniques and morphological characteristics of different plant groups.
- Students are expected to learn about the history of Plant Systematics and its role in classification. They are able to make use of this knowledge for the identification and grouping of different plants based on the anatomy.
- Students are expected to learn about classification on the basis of anatomical difference into different groups.
- The students will be able to describe, apply and integrate the basic concepts of Cell Biology including Genetics and Evolution, Structure and Functions of Organisms.
- The students are made aware of Evolutionary Architecture of Early Vascular Land Plants, Lycophytes, Sphenophytes and Ferns, geological time table, fossil plants.
- The students get detail knowledge of National plant wealth & diversity of plants of different regions found in India, hotspots of the country.

Program Specific Outcome

PSO1-To provide thorough knowledge about various plant groups from primitive to highly evolved.

PSO2-To make the students aware of beneficial applications of different plants in various industries.

PSO3-To highlight the potential of these studies to become an entrepreneurs.

PSO4-To equip the students with skills related to laboratory as well as field based studies.

PSO5- To make the students aware about conservation and sustainable use of plants.

PSO6- To address the socio-economical challenges related to plant sciences.

PSO7- To create foundation for further studies in Botany and to facilitate students for taking up

and shaping a successful career in Botany.

Course Outcome

CO-I-Biology & Diversity of viruses, bacteria and algae

- To lay a strong foundation to the study of microorganisms- bacteria, virus, algae in Botany.
- The students will understand the world and diversity of microbial science.
- Students will be made aware of the applications of microbiology in different fields.
- To understand the concept of evolution as the basis of Biodiversity.

CO-II- Biological diversity of Bryophytes, Pteridophytes & Gymnosperms

- Through this course students will understand the evolutionary trends in Plants. The general characteristics such as distribution, morphological, anatomical, reproduction and economic importance of different plant groups.

CO-III Basic Ecology

- Students will understand the important patterns of population ecology, birth and death rate patterns.
- To make students aware about the extent of the total biodiversity and their conservation. Types of succession types occurring in nature. Its perturbation and restoration and flow of energy pathways.
- Understand soil as an important parameter and different biogeochemical cycles.

CO-IV Biochemistry

- To learn the basic structure of Water and its properties. Role of free energy, ATP and basic reactions involved.
- Understand the role of enzymes and their significance
- To impart an insight into the internal structure of proteins, carbohydrates and Lipids.
- To families with the research oriented techniques of GLC and mass spectrometry.

CO-V- Taxonomy of Angiosperms

- Acquaint with the aims, objectives and significance of taxonomy.
- Familiarizing with the plant having immense economic importance.
- Understand the Modern trends used in Plant Taxonomy.
- To study different economically important angiospermic families.
- Importance and nature of different plants in the field of drug, food, oil production etc.
- To know the role and importance of Ethnobotany and plants used by tribals.

CO-VI- Resource utilization and conservation

- To enable the students to understand the Major Biomes and the importance and different strategies for the conservation of Resource utilization.
- To make aware of different types of Pollutions and their control measures. Bioremediation and its significance.
- Motivate the students towards the latest technology of Remote sensing and its applications.

CO-VII- Biology and Diversity of Fungi

- Familiarize the students with the diversity of fungal and lichen world and their significance.
- Understand the fungal diversity, genetics and their biotechnological importance in production of antibiotics, alkaloids, mycofoods, mycopesticides.

CO-VIII- Biostatistics and computer applications

- To understand the Importance and scope of statistics, Elements of probability, Test of significance, Chi square statistics

- History and development of computers
- To equip the students with basic computer skills necessary for research.
- Apply optimization, numerical methods, statistical methods to solve problems and orient towards research.

CO-IX- Plant Physiology

- To understand the basic principles related to various physiological functions in plant life.
- Familiarize with the basic skills and temperatures related to plant physiology.
- Applications of plant hormones and secondary metabolites.
- Understand the stress physiology

CO-X-Genetics and Molecular Biology

- To understand the genetics of microorganisms.
- To study the chromosome structure, Mutations and mutagens.
- Gene expression in prokaryotes and eukaryotes.

CO-XI-Plant reproduction & Development

- To impart and insight into the internal structure and reproduction and the most evolved group of plants.
- Impart detailed information of the morphology and development of reproductive parts.
- Study the root, shoot, embryo and endosperm development.

CO-XII-Biotechnology

- To understand the perspective and scope of biotechnological process and products.
- Awareness regarding Patenting and Cloning
- Culturing and Immobilization of microbial cells and enzymes, strain improvement, Bioreactor, biodegradation & bioremediation.

CO-XIII- Plant Cell, Tissue culture & Organ culture

- History, scope and application of Plant tissue culture is made aware to the students.
- To apprise the students regarding techniques like In vitro fertilization, Organogenesis, embryogenesis and Somatic hybridization, Cryopreservation and germplasm storage.

CO-XIV-Biotechnology & Genetic engineering

- Make students aware about the concept of Intellectual property rights and basic concepts of recombinant DNA technology.
- To acquaint students regarding the techniques of PCR, DNA fingerprinting
- To know the role of Genetic engineering of plants, Genetic improvements of industrial microbes and Genomics & proteomics.
- Familiarize with the fundamental principals of biotechnology, various developments in biotechnology and potential applications.

CO-XV-A-Ethno botany

- To Understand the scope of ethnobotany.
- Importance of plants in various systems of medicines such as Ayurvedic, Unani, Allopathic, homeopathic.
- Plants used by tribals, folk lore and folk tales.
- To make the students aware of applications of different herbal plants in different diseases and various industries.

CO-XVI-B-Plant Protection

- Understand various plant diseases and their impact on agriculture.
- Understand the methods of crop improvement, Biological plant protection measures.
- Design different post harvest methods to cope over diseases.
- To highlight the potential of these studies to become an entrepreneur.

- To make the students aware about conservation and sustainable use of plants.

Students can be employed in Following sectors, after doing M.Sc. in Botany

- Drug Companies
- Fruit Growers
- Biotechnology Firms
- Oil Industry
- Seed Companies
- Lumber or Paper Companies
- Nurseries & green houses
- Food Companies
- Biological Supply Houses

- **Jobs in government sectors include :**

National Park Service

Departments of Conservation and Land Management

Animal and Plant Health Inspection Services

Public Health Service

Department of Agriculture

Forest Service

Departments of Environmental Protection

Departments of Agriculture and Water

Nature Conservancy

Environmental Protection Agency

Medicinal Plant Resources Laboratory