



Sree Narayana Mangalam College Maliankara

(Affiliated to Mahatma Gandhi University, Kottayam)

PROGRAMME OUTCOME

PROGRAMME SPECIFIC OUTCOME, COURSE OUTCOME

M. Sc. BOTANY

Sree Narayana Mangalam College
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At the end of the M. Sc. Botany Program at S.N.M College, Maliankara, a student will have developed:

POST GRADUATE PROGRAMME OUTCOMES

PO1:	Subject competence and Problem Solving: Understanding the respective subject matter to become subject experts in the field and solve problems of relevance to society to meet the specified needs using the knowledge, skills and attitudes acquired from the program of study is the sole intention of this program outcome. It enables the student at viewing multiple perspectives to analyse any situation/task at hand and derive feasible solutions by optimistically approaching a problem. This inculcates independent research aptitudes and strong decision
PO2:	Research-related skills: A sense of inquiry and capability for asking relevant/appropriate questions, problem solving, synthesizing and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation.
PO3:	Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.
PO4:	Analytical reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.
PO5:	Scientific Reasoning: Ability to analyze, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.
PO6:	Self-directed Learning: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.

PO7:	Critical Thinking: Capability to apply analytic thought to a body of knowledge; analyze and evaluate evidence, arguments, claims, beliefs based on empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.
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PROGRAMME SPECIFIC OUTCOMES

At the end of M. Sc. Botany at S.N.M College, Maliankara, a student will have developed:

PSO1	A strong foundation in Botany by understanding the different plant groups based on morphology, anatomy genetics and evolution.
PSO2	The students become capable of performing short research projects using various tools and techniques in plant science and develop research aptitude
PSO3:	Students become competent in various technical and research skill related to plant sciences
PSO4:	Enhance the ability to apply the principles of environmental sustainability in everyday life and create capacity to solve various environmental problems
PSO5:	Equip the students for employment, entrepreneurship and further study in Botany

COURSE OUTCOMES

SEMESTER I

BY010101: MICROBIOLOGY AND PHYCOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To provide an idea on the tiny living forms of the world
CO2:	To study the applied aspects of microbiology
CO3:	To understand one among the most important plant creatures, algae, of the world
CO4:	To facilitate knowledge on recent advances in Phycology
CO5:	To impart knowledge on experimental and environmental aspects on algae
CO6:	Get in depth knowledge about various microorganisms

BY010102: MYCOLOGY AND CROP PATHOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To introduce the students to the world of fungi, the decomposers of plant kingdom.
CO2:	To create an idea on structure and life cycles of fungi
CO3:	To provide basics and advanced aspects of crop pathology
CO4:	To envisage host- pathogenicity and on different patterns of pathogen interaction
CO5:	Students can understand the various economic and ecological importance of fungi
CO6:	To make aware on the various methods adopted to prevent plant diseases

BY010103: BRYOLOGY AND PTERIDOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To introduce students on amphibians of plant kingdom
CO2:	To evaluate the life cycles and growth forms of Bryophytes

CO3:	Make awareness on the salient features of vascular cryptogams
CO4:	To study the structure, reproduction and life cycles of Pteridophytes
CO5:	Understand diversity of bryophytes and Pteridophytes in natural habitats and identify them
CO6:	Understand economic and ecological importance of bryophytes and pteridophytes:

BY010104: GYMNOSPERMS, PALEOBOTANY AND EVOLUTION

At the end of this course, a student will have developed ability to:

CO1:	To enable students to explore the life form of ancient land plants
CO2:	To study the evolutionary aspects of naked seed plants
CO3:	To go through the history of life on earth
CO4:	To explore the evolution of life, especially plants
CO5:	Techniques and applied aspects of in Palaeontology:
CO6:	Familiarize various gymnosperms in nature and field identification of Indian gymnosperms

SEMESTER II

BY010201: PLANT ANATOMY, DEVELOPMENTAL BIOLOGY & HORTICULTURE

At the end of this course, a student will have developed ability to:

CO1:	To acquaint students on the internal structure of plants
CO2:	To study different tissue systems
CO3:	To understand the development aspects of plants
CO4:	To introduce students to the world of garden culture
CO5:	To create an idea about modern horticultural practises
CO6:	Utilize horticulture for entrepreneurial purpose

BY010202: CELL BIOLOGY, GENETICS AND PLANT BREEDING

At the end of this course, a student will have developed ability to:

CO1:	Enabling the students to explore the intricacies of plant life forms at cellular, molecular and nano level.
CO2:	To familiarize recent advances genetic engineering
CO3:	To convey a brief idea on plant breeding
CO4:	To understand modern breeding techniques
CO5:	Identification of different stages of meiosis.
CO6:	Understand the cell cycle control mechanisms

BY010203: PLANT PHYSIOLOGY AND BIOCHEMISTRY

At the end of this course, a student will have developed ability to:

CO1:	To encourage students on the form and function of plants
CO2:	To study various metabolic pathways
CO3:	To study the details of photosynthesis and respiration
CO4:	To envisage the chemical nature of plants
CO5:	To impart knowledge on types on enzymes, lipids and secondary metabolites
CO6:	Preparation of buffers of various strengths.

BY010204: MOLECULAR BIOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To encourage students to study the gene interactions and genomes in detail
CO2:	To provide valuable research outcomes of molecular biology
CO3:	In depth understanding about organization of the genome
CO4:	Understand Control of Gene Expression in prokaryotes and eukaryotes
CO5:	Gain knowledge about DNA repair mechanisms:
CO6:	Work out problems based on DNA structure, replication, gene expression and genetic code

SEMESTER III

BY010301: RESEARCH METHODOLOGY, MICROTECHNIQUE, BIOSTATISTICS AND BIOPHYSICAL INSTRUMENTATION

At the end of this course, a student will have developed ability to:

CO1:	To convey and encourage students about the need of research
CO2:	To familiarize various kind journals and publication details
CO3:	To provide vital understanding on collection, preservation, sectioning, staining, and making of permanent preparations of various plant tissues
CO4:	To impart about the importance of statistics in biological sciences
CO5:	To bestow the importance of instrumentation in plant sciences
CO6:	Analysis with statistical inference – Estimation - Testing of hypothesis of data

BY010302: BIOTECHNOLOGY, BIOINFORMATICS & BIO NANOTECHNOLOGY

At the end of this course, a student will have developed ability to:

CO1:	To transmit the knowledge of bioprocessing and micropropagation
CO2:	To introduce genome editing and other advance techniques in biotechnology
CO3:	To confer advancements in bioinformatics
CO4:	To provide an overview of nanotechnology and its applications
CO5:	Isolation, preparation, sterilization and inoculation of different explants.
CO6:	Aware about Use of nanoparticles in agriculture, medicine and environment.

BY010303: ANGIOSPERM TAXONOMY, ECONOMIC BOTANY & ETHNOBOTANY

At the end of this course, a student will have developed ability to:

CO1:	To provide the enthusiasm of naming and classification of higher plants
CO2:	To accord students to study the diversity of plants
CO3:	To make aware about the economic aspects of plants
CO4:	To impart knowledge on the ethnobotanical aspects of plant groups

CO5:	Identification of local plant using Flora of Presidency of Madras - J. S. Gamble.
CO6:	Be aware about important tribal people of Kerala and plants used by them

BY010304: ENVIRONMENTAL SCIENCE

At the end of this course, a student will have developed ability to:

CO1:	To make a clear idea on ecological sciences and various ecosystems of the world
CO2:	To create awareness on biodiversity and conservation
CO3:	To render the scenario of various pollutions: their causes and remedies
CO4:	Identification of trophic levels, food webs and food chains, plant diversity in a field
CO5:	Aware of the common environmental problems, their consequences and possible solutions.
CO6:	Evaluate the role of biotechnology in conservation of species.

SEMESTER IV: ELECTIVE

BY820401: BASIC CONCEPTS IN ENVIRONMENTAL STUDIES

At the end of this course, a student will have developed ability to:

CO1:	To make better understanding on earth and atmosphere
CO2:	To create an awareness on weather and climate and its influences on ecosystems
CO3:	To go through the details of various ecosystems of the world
CO4:	Identification of plants growing in different habitats and know their adaptations
CO5:	Structure, function, and characteristics of various ecosystems
CO6:	Understand the scope of climatology and know the effects of climate change

BY820402: NATURAL RESOURCES AND THEIR MANAGEMENT

At the end of this course, a student will have developed ability to:

CO1:	To provide basics on preservation, conservation, and restoration of natural resources
CO2:	To convey the values of various resources, i.e., energy, land and biological
CO3:	To make an awareness on climate change, society, and environment etc.
CO4:	Principles of various resource management
CO5:	Understand the Importance and need of environmental ethics.
CO6:	Understand the scope and basic theories of environmental economics;

BY820403: ENVIRONMENTAL MONITORING AND MANAGEMENT

At the end of this course, a student will have developed ability to:

CO1:	To envisage students on environmental and ecosystem monitoring and management
CO2:	To introduce students to various advancements in remote sensing GIS
CO3:	To comply students regarding sustainable development
CO4:	Get knowledge about concepts of Remote Sensing.
CO5:	Understand salient features of Environmental laws and policies followed in India
CO6:	Make an awareness on effect of toxic chemicals in the environment