



**ST. THOMAS COLLEGE (AUTONOMOUS)**  
THRISSUR, KERALA - 680 001

College with Potential for Excellence  
NIRF INDIA Ranking 2021 : 64<sup>th</sup>

[www.stthomas.ac.in](http://www.stthomas.ac.in)

**PROGRAMME OUTCOMES**  
**PROGRAMME SPECIFIC OUTCOMES**  
**COURSE OUTCOMES**

**M.Sc Botany**

## OUTCOMES

At the end of Post Graduate Program at St. Thomas College (Autonomous), a student will have obtained:

|     |  |
|-----|--|
| PO1 | Attained profound Expertise in Discipline  |
| PO2 | Acquired Ability to function in multidisciplinary domains                            |
| PO3 | Attained ability to exercise Research Intelligence in investigations and Innovations |
| PO4 | Learnt Ethical Principles and be committed to Professional Ethics                    |
| PO5 | Incorporated Self-directed and Life-long Learning                                    |
| PO6 | Obtained Ability to maneuver in diverse contexts with Global Perspective             |
| PO7 | Attained Maturity to respond to one's calling  |

### **Program Specific Outcomes**

At the end of M.Sc Botany at St. Thomas College (Autonomous), Thrissur, a student will have developed:

|      |   |
|------|---|
| PSO1 | Differentiate plant groups according to their morphology, anatomy and genetics.   |
| PSO2 | Practice the methodology followed in plant protection, propagation and improvement.   |
| PSO3 | Understand the advanced concepts of physiology, biochemistry and molecular biology of plant and microbes.                             |
| PSO4 | Employ problem solving and laboratory skills pertaining to biological techniques and apply strategies for environmental conservation. |
| PSO5 | Adapt scientific methods in plant research and create entrepreneurships   |

## Course Outcomes

### M.Sc Botany

#### **BOT1C01- Phycology, Bryology, Pteridology and Gymnosperms**

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

|     |   |
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| CO1 | Understand life cycles of lower groups and Gymnosperms.   |
| CO2 | Understand the structure and habitats of lower groups and gymnosperms.  |
| CO3 | Discuss the economic importance of lower groups and gymnosperms   |
| CO4 | Differentiate the types of Algae, Bryophytes, Pteridophytes and Gymnosperms based on morphology and internal anatomy. |
| CO5 | Identify the contributions of Indian Phycologists and Pteridophytes.  |
| CO6 | Understand the significance of geological time scale in the history and evolution of earth's flora                    |
| CO7 | Compare the living lower groups and gymnosperms with fossil types to decipher their evolutionary affinities           |

## M.Sc Botany

### Bot1c02: Mycology & Lichenology, Microbiology And Plant Pathology

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

|     |  |
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| CO1 | Understand the classification and characteristic features of fungi, lichens, and microbes.               |
| CO2 | Understand the principles of plant pathology and disease management.                                     |
| CO3 | Discuss the use of fungi as saprophytes and symbionts.   |
| CO4 | Discuss the application of microbiology in agriculture, industry and medicine                            |
| CO5 | Identify different types of fungi and microbes through field collection, micro preparation and herbarium |
| CO6 | Apply the skill to identify plant diseases based on symptoms   |
| CO7 | Apply the knowledge attained in food microbiology to improve dietary quality and health                  |

## M.Sc Botany

### Bot1c03. Angiosperm Anatomy, Angiosperm Embryology, Palynology & Lab Techniques

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

|     |  |
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| CO1 | Understand the development and differentiation of tissues.   |
| CO2 | Understand the reproductive biology of angiosperms.  |
| CO3 | Demonstrate skill in sectioning and to prepare permanent micro and macro preparations.                       |
| CO4 | Comparison of the taxonomic evidences from anatomy, embryology and palynology                                |
| CO5 | Distinguish different taxa and identify stress related signatures in plant Anatomy through the wood Anatomy  |
| CO6 | Apply the knowledge of reproductive biology to solve issues related to sexual incompatibility of seed plants |

## M.Sc Botany

### Bot2c04. Cell Biology, Molecular Biology And Biophysics

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

|     |   |
|-----|---|
| CO1 | Understand the dynamics of chromosome behaviour and its interactions                  |
| CO2 | Understand the central dogma of life  |
| CO3 | Understand the biophysical techniques of instrumentation                              |
| CO4 | Discuss the significance of cell cycle and its application in cancer biology          |
| CO5 | Apply the knowledge of biophysics and molecular biology in research studies           |
| CO6 | Apply the knowledge of molecular evolution to decipher the phylogeny of gene families |

## M.Sc Botany

### Bot2c05. Cytogenetics, Genetics, Biostatistics, Plant Breeding And Evolution

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

|     |  |
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| CO1 | Understand the various concept of genetics   |
| CO2 | Understand statistical tools for collection, analysis, interpretation and visualization of data. |
| CO3 | Understand the plant breeding techniques used in crop improvement                                |
| CO4 | Identify legal regulations related to IPR  |
| CO5 | Demonstrate hybridization technique in different crop plants                                     |
| CO6 | Apply statistical tools in biological experiments  |
| CO7 | Analyze the structural and numerical chromosome alteration in crop improvement                   |
| CO8 | Solve problems in quantitative, population and molecular genetics                                |



## M.Sc Botany

### Bot2c06. Plant Ecology, Conservation Biology, Phytogeography And Forest Botany

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

|     |   |
|-----|---|
| CO1 | Understand the importance of ecosystem, biodiversity and energy flow                                  |
| CO2 | Understand the phytogeographical distribution patterns  |
| CO3 | Recognize the different forest types and products for sustainable utilization of bio- resources       |
| CO4 | Identify the threatened plants and threats to global environment                                      |
| CO5 | Identify the population characteristics and its significance  |
| CO6 | Demonstrate skill for Environmental Impact Assessment   |
| CO7 | Evaluate the role of different biodiversity conservation ventures at local/national and global levels |
| CO8 | Apply new strategies for in-situ and ex-situ conservation of biodiversity                             |

## M.Sc Botany

### Bot3c07. Plant Physiology, Metabolism And Biochemistry

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

|     |  |
|-----|--|
| CO1 | Understand the physiology of plants with reference to water relations and mineral nutrition  |
| CO2 | Understand the role of hormones in plant development   |
| CO3 | Describe the metabolic processes of plants   |
| CO4 | Explain the different primary metabolic pathways and its regulations                         |
| CO5 | Demonstrate skill to estimate quantitatively the primary and secondary metabolites in plants |
| CO6 | Analyze the role of external factors in plant development and stress induction               |
| CO7 | Compare the evolution of different photoreceptive pigments and photosynthetic pathways       |
| CO8 | Evaluate the physiological, ecological and phylogenetic importance of secondary metabolites  |

## M.Sc Botany

### Bot3c08. Angiosperm Morphology, Taxonomy And Plant Resources

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

|     |  |
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| CO1 | Understand the theories of origin and evolution of angiosperms, its floral parts and co-evolution of pollinators |
| CO2 | Understand the systems of classification and phylogeny of plants   |
| CO3 | Understand the rules of ICN, botanical garden, character weighing, literature in plant taxonomy                  |
| CO4 | Identify the different plant family members through field trip and herbarium preparation                         |
| CO5 | Identify the modern trends in plant taxonomy   |
| CO6 | Identify and categorize different types of plant resources   |
| CO7 | Analyse the current scenario of Indian taxonomy, herbaria and organizations                                      |
| CO8 | Apply the knowledge of taxonomy to identify the plant species using floras and keys                              |

## M.Sc Botany

### Bot3c09 Biotechnology And Bioinformatics

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

|     |   |
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| CO1 | Understand the basic concepts and advanced techniques of plant tissue culture         |
| CO2 | Understand the concepts and techniques involved in recombinant DNA technology         |
| CO3 | Understand biological databases and emerging trends in bioinformatics                 |
| CO4 | Evaluate the prospects, achievements and ethical issues regarding transgenics         |
| CO5 | Develop skill in micropropagation and to establish commercial tissue culture ventures |
| CO6 | Acquire knowledge in the usage of biological networks                                 |
| CO7 | Analyse the genomes and proteomes with the aid of computational softwares             |

## M.Sc Botany

### **BOT4E01- Environmental Biology and Biodiversity Conservation**

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

|     |   |
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| CO1 | Understand population and community ecology and major global environmental challenges                       |
| CO2 | Discuss global initiative and regional initiatives for environment protection                               |
| CO3 | Discuss the important environmental protection laws in India and Indian environmental activists.            |
| CO4 | Discuss the impact of climate change on ecosystem and role of people movements of biodiversity conservation |
| CO5 | Explain the different biodiversity information resources, metadatabases and virtual libraries               |
| CO6 | Analyse biodiversity in terms of wild and agro biodiversity and its conservation practices                  |
| CO7 | Evaluate different types of habitats with reference to Kerala   |
| CO8 | Apply conservation strategies in global perspective for the use and restoration of threatened ecosystem     |

## M.Sc Botany

### BOT4E02- Genetic Engineering

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

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| CO1 | Understand the general procedure of gene cloning                             |
| CO2 | Understand gene therapy strategies and its application in medical field      |
| CO3 | Understand different molecular markers and its application                   |
| CO4 | Discuss various techniques employed in                                       |
| CO5 | the creation of transgenic crops and the ethical issues involved.            |
| CO6 | Acquire basic skills in techniques of genetic engineering                    |
| CO7 | Evaluate the merits and demerits of different tools used in r-DNA technology |
| CO8 | Evaluate the merits and demerits of different tools used in r-DNA technology |

## M.Sc Botany

### Bot4p01 Dissertation

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

|     |  |
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| CO1 | Recognize the knowledge gaps in botanical research                             |
| CO2 | Examine relevant literature and write a literature review of the chosen field  |
| CO3 | Apply theoretical frameworks to the chosen area of study                       |
| CO4 | Demonstrate the ability to collate and critically interpret data               |
| CO5 | Demonstrate the skill to write research report and scientific publications     |
| CO6 | Develop an ability to effectively communicate knowledge in a scientific manner |
| CO7 | Propose recommendations based on research findings                             |

