



ST. ALBERT'S COLLEGE (AUTONOMOUS)
ERNAKULAM

An initiative of the Archdiocese of Verapoly

(Affiliated to Mahatma Gandhi University, Kottayam)

DEPARTMENT OF BOTANY
PROGRAMME: M.Sc. BOTANY

Programme Outcomes

Programme Specific Outcomes

Course Outcomes

PO Nos.	Programme Outcomes
PO.1	Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
PO.2	Problem solving: Solve problems from the Disciplines of concern using the Knowledge, skills and attitude acquired from humanities / science / mathematics Social Sciences etc.
PO.3	Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.
PO.4	Global perspective . Understand the economic and social and ecological connections that link the world's nations and people

PSO No.	Intended Programme Specific Outcomes Upon completion of the M.Sc. Botany Degree Programme, the graduates will be able to:
PSO-1	To have comprehensive knowledge of classical and modern arenas in plant sciences .
PSO-2	Integrate the acquired knowledge and skills to solve problems, take appropriate decisions, with an innovative approach.
PSO-3	Share social, environmental and ethical concerns with fellow citizens in areas of biodiversity conservation, environmental protection and management.
PSO-4	Proficiency in concepts , tools and techniques that have a multidisciplinary dimension in teaching , research and entrepreneurial ventures.

PBT1CRT0119- MICROBIOLOGY & PHYCOLOGY

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Describe the unique features of different groups of bacteria and virus.	U	PSO 1 PO 1
2	Apply the conventional and advanced techniques in isolation, culturing and identification of bacteria.	Ap	PSO 2 PO 1
3	Determine the classificatory approaches and principles in algal taxonomies.	An	PSO 1,4 PO 1
4	Examine the morphology, internal structure and reproduction of different types of algae for better understanding and their identification and culturing.	An	PSO 1 PO 1,2
5	Evaluation of ecological and economic importance of algae and apply practical skills in culturing, identification and algal biotechnology .	E	PSO 2,4 PO 4

Course Out comes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT1CRT0119.1	U	2				2			
PBT1CRT0119.2	Ap	1					1		
PBT1CRT0119.3	An	2				2			2
PBT1CRT0119.4	U	3	1			2			
PBT1CRT0119.5	E				1	2			2
PBT1CRT0119		2	1		1	2	1		2

PBT1CRT0219- MYCOLOGY & CROP PATHOLOGY

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Analyse and evaluate the characteristic features, the principles involved in classification and economic and agricultural significance of fungi	An	PSO 1,3 PO 1,4
2	Examine the fungal interactions in nature and predict their adaptive strategies.	C	PSO 1,2 PO 1
3	Enrich skills in basic methods of mycological studies and gain hands-on experience on fungal culture, isolation and identification.	Ap	PSO 2,3 PO 4
4	Relate basic methods of mycological studies and hands-on experience on pathogen culture and isolation methods in identification of the same.	An	PSO 2,4 PO 2
5	Apply the principles in the biology of plant pathogens and pests including disease epidemiology and disease management.	Ap	PSO 1,4 PO 2

Course Outcomes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT1CRT0219	An	2			1	2		1	
PBT1CRT0219	C	2				2	1		
PBT1CRT0219	Ap				1		2	1	
PBT1CRT0219	An		1				1		1
PBT1CRT0219	Ap		2			2			2
PBT1CRT0219		2	1.5		1	2	1.3	1	1.5

PBT1CRT0319- BRYOLOGY & PTERIDOLOGY

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Applies the knowledge obtained to identify the various Bryophytes and Pteridophytes.	Ap	PSO 1 PO 1
2	Differentiates between the life-cycles of homosporous and heterosporous Pteridophytes.	An	PSO 1 PO 1
3	Analyses how heterospory leads to seed habit in the higher plants.	An	PSO 1 PO 1
4	Realises the ecological and economic importance of Bryophytes and Pteridophytes and how they can be utilised in daily life.	Ap	PSO 1,4 PO 4
5	Recognizes the natural habitat, diversity, general features and classification of Bryophytes and Pteridophytes.	An	PSO 1,3 PO 3

Course Out comes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT1CRT0319.1	Ap	2				2			
PBT1CRT0319.2	An	2				2			
PBT1CRT0319.3	An	2				2			
PBT1CRT0319.4	Ap				2	2			1
PBT1CRT0319.5	An			2		2		1	
PBT1CRT0319		2		2	2	2		1	1

PBT1CRT0419- GYMNOSPERMS, PALEOBOTANY & EVOLUTION

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Summarise the classification , distribution , economic importance of gymnosperms	An	PSO 1,2 PO 1
2	Distinguish vegetative and reproductive structures of various classes of gymnosperms .	An	PSO 1,2 PO 2
3	Explain the types of fossils and various techniques used in Palaeontology.	An	PSO 1 PO 1
4	Analyse the causes of organic evolution and speciation	An	PSO 1 PO 1
5	Interpret and integrate various theories explaining evolution.	Ap	PSO 2 PO 1

Course Out comes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT1CRT0419.1	An	2				2	2		
PBT1CRT0419.2	An		2			2	2		
PBT1CRT0419.3	An	2				2			
PBT1CRT0419.4	An	1				2			
PBT1CRT0419.5	Ap	1					1		
PBT1CRT0419		1.5	2			2	1.6		

PBT2CRT0119- Plant Anatomy, Developmental Biology & Horticulture

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Explain the anatomical features and functions of various plant tissues.	An	PSO 1 PO 1
2	Distinguish between the anatomical features of various reproductive parts, primary and secondary structures of vegetative parts.	An	PSO 2 PO 2
3	Comparison of different types of stomata, nodal patterns, anthers, ovules, embryogeny and endosperm development in various angiosperms.	An	PSO 2 PO 2
4	Identify and chart out the developmental stages in the life-cycle of Angiosperms.	An	PSO 1 PO 1
5	Apply knowledge of traditional and modern practices in Horticulture for plant propagation and developing bonsai, terrarium, aquaponics, etc.	Ap	PSO 2,3,4 PO 3,4

Course Out comes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT2CRT0119.1	An	2				2			
PBT2CRT0119.2	An		2				2		
PBT2CRT0119.3	An		2				1		
PBT2CRT0119.4	An	2				2			
PBT2CRT0119.5	Ap			1	1		2	1	1
PBT2CRT0119		2	2	1	1	2	1.6	1	1

PBT2CRT0219- Cell Biology, Genetics & Plant Breeding

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Examine the intracellular organelles and associated life process, cell signalling and communication, cell cycle events and its regulation mechanisms.	U	PSO 1 PO 1
2	Apply principles of genetics and solve problems on linkage, crossing over and gene mapping.	Ap	PSO 2 PO 2
3	Explain the concepts and principles of population genetics	U	PSO 1 PO 1
4	Familiarize the students with objectives and methods of plant breeding	U	PSO 1 PO 1
5	Develop and design the traditional and modern methods of crop improvement	C	PSO 2 PO 2

Course Outcomes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT2CRT0219.1	U	2				2			
PBT2CRT0219.2	Ap		1				2		
PBT2CRT0219.3	U		1				1		
PBT2CRT0219.4	U	2				2			
PBT2CRT0219.5	C		1				1		
PBT2CRT0219		2	1			2	1.3		

PBT2CRT0319- PLANT PHYSIOLOGY & BIOCHEMISTRY

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Describe the physiology regulating water and mineral absorption and translocation in plants and the significance of nitrogen metabolism.	U	PSO 2 PO 1
2	Describe the concept of light harvesting by plants in response with varying environmental conditions and identify the role of Plant Growth Regulators in development of entrepreneurship in the area of plant physiology	Ap	PSO 4 PO 2
3	Judge and evaluate the biochemical mechanisms involved in the energy generating process of respiration and the understanding of the same in relation to stressed conditions in plants.	E	PSO 1 PO 2
4	Examine the structure and function of important biomolecules and understand their importance in the maintenance of living systems.	An	PSO 1 PO 1
5	Assess the structure, kinetics and regulation of enzymes and design methodologies for isolation, purifying and modifying enzymes.	C	PSO 2 PO 2

Course Out comes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT2CRT0319.1	U	2				2			
PBT2CRT0319.2	Ap		1						1
PBT2CRT0319.3	E		2			2			
PBT2CRT0319.4	An	2				2			
PBT2CRT0319.5	C		1				1		
PBT2CRT0319		2	1.3			2	1.5		1

PBT2CRT0419- MOLECULAR BIOLOGY

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Distinguish between the structure and function of different types of genetic material.	An	PSO 1 PO 1
2	Explain the molecular mechanisms of gene expression.	An	PSO 1 PO 1
3	Differentiate between the form and functioning of DNA, RNA and protein.	An	PSO 1 PO 1
4	Explain the mechanism of regulation of gene expression	An	PSO 1 PO 1
5	Correlate between mode of gene expression and functioning of an organism.	An	PSO 1 PO 1

Course Out comes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT2CRT0419.1	An	2				1			
PBT2CRT0419.2	An	1				2			
PBT2CRT0419.3	An	2				1			
PBT2CRT0419.4	An	2				1			
PBT2CRT0419.5	An	1				2			
PBT2CRT0419		1.6				1.4			

PBT3CRT0119- Research methodology, Microtechnique, Biostatistics and Biophysical Instrumentation

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Develop a sense of inquiry to see research as a career and to take up a particular problem or concern to their scientific analysis.	Ap	PSO 2 PO 1
2	Demonstrate the capacity of in-depth analysis of information and creation of space for generating new questions, concepts and understandings.	An	PSO 4 PO 2
3	Describe and apply the principles and techniques of microtechnique in the preparation of temporary and permanent microscopic slides.	Ap	PSO 4 PO 1
4	Demonstrate competency in working with microscopes, chromatography, electrophoresis and spectroscopy .	Ap	PSO 4 PO 1
5	Analyse data using various tests of significance	An	PSO 2 PO 2

Course Out comes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT3CRT0119.1	Ap	2				2			
PBT3CRT0119.2	An		1					1	
PBT3CRT0119.3	Ap	2						2	
PBT3CRT0119.4	Ap	1						1	
PBT3CRT0119.5	An		2			2			
PBT3CRT0119		1.66	1.5			2		1.3	

PBT3CRT0219- Biotechnology, Bioinformatics and Bionanotechnology

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Demonstrate the skill in planning and executing microbial biotechnology-based research.	Ap	PSO 2 PO 2
2	Apply the knowledge of various tools and techniques of recombinant DNA technology.	Ap	PSO 3 PO 1
3	Develop skill in plant tissue culture techniques which finds application in the agricultural, medical and environmental sectors.	C	PSO 4 PO 2
4	Apply the knowledge of bioinformatics softwares for revealing various facts about living organisms.	Ap	PSO 2 PO 2
5	Analyse the various aspects of nanotechnology and its applications in problem solving	Ap	PSO 2 PO 2

Course Out comes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT3CRT0219.1	Ap		1			1			
PBT3CRT0219.2	Ap	1					2		
PBT3CRT0219.3	C		2					1	
PBT3CRT0219.4	Ap		1			2			
PBT3CRT0219.5	Ap		2			1			
PBT3CRT0219		1	1.5			1.33	2	1	

PBT3CRT0319- Angiosperm taxonomy, Economic Botany and Ethnobotany

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Differentiate between the salient features of various angiosperms families.	An	PSO 1 PO 1
2	Identify the local flora using the Flora of the Presidency of Madras (J. S. Gamble).	Ap	PSO 1 PO 1
3	Apply knowledge to work out nomenclatural problems regarding priority and author citations.	Ap	PSO 2 PO 2
4	Analyse various data sources, tools of taxonomy and phylogeny of Angiosperms.	An	PSO 4 PO 1
5	Identify and utilise the economically important plants, and discuss the sources and methods of ethnobotanical studies.	U	PSO 1 PO 1

Course Out comes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT3CRT0319.1	An	2				2			
PBT3CRT0319.2	Ap	2				2			
PBT3CRT0319.3	Ap		2				2		
PBT3CRT0319.4	An	1							1
PBT3CRT0319.5	U	1				1			
PBT3CRT0319		1.5	2			1.67	2		1

PBT3CRT0419- ENVIRONMENTAL SCIENCE

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Apply the concepts in population and community ecology towards creation of a better sense of environmental protection with good understanding on the dynamics of the Ecosystem.	Ap	PSO 2 PO 1
2	Conceive a good understanding on Biosphere and Ecosystem and able to predict the Phytogeographical variation	An	PSO 1 PO 2
3	Evaluate the anthropogenic/ natural causes leading to disaster and climatic changes	U	PSO 2 PO 2,3
4	Analyse global environmental problems and suggest its management strategies.	An	PSO 3 PO 4
5	Evaluate the values of biodiversity and reasons for biodiversity loss and suggest measures to conserve biodiversity	Ap	PSO 3 PO 1,4

Course Outcomes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT3CRT0419.1	Ap	1				1			
PBT3CRT0419.2	An		1			1			
PBT3CRT0419.3	U		2	1		2			
PBT3CRT0419.4	An				2			1	
PBT3CRT0419.5	Ap	2			1			2	
PBT3CRT0419		1.5	1.5	1	1.5	1	1.	1.5	

PBT4CRT0119- Plant Tissue Culture and Microbial Biotechnology

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Apply the principles of tissue culture in plant propagation.	Ap	PSO 2 PO 1
2	Demonstrate skills in isolation, purification and culture of protoplasts.	Ap	PSO 4 PO 2
3	Identify the techniques for conservation and preservation of germplasms.	U	PSO 2,4 PO 2,4
4	Evaluate the potential uses of various microbes in industrial production of materials/ processes.	Ap	PSO 3,4 PO 4
5	Explore the scope of microbes and plants in bio/phyto-remediation process for environmental health	Ap	PSO 1,3 PO 4

Course Outcomes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT4CRT0119.1	Ap	2				2			
PBT4CRT0119.2	Ap		1						1
PBT4CRT0119.3	U		2		1	2			1
PBT4CRT0119.4	Ap				1				
PBT4CRT0119.5	Ap				1	2		1	
PBT4CRT0119		2	1.5		1	2	2	1	1

PBT4CRT0219- Genetic Engineering, Genome Editing and Immunology

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Explains various enzymes and ligation strategies used in gene cloning.	U	PSO 1 PO 1
2	Compare the unique features of different vectors and identify the suitable cloning strategy and screening technique for gene cloning experiments.	Ap	PSO 1 PO 1
3	Explains the construction of DNA libraries	U	PSO 1 PO 1
4	Explain and apply advanced recombinant DNA techniques in cutting-edge research.	Ap	PSO 4 PO 3
5	Describe the basic principles, techniques and strategies involved in immunology and their significance in our lives.	An	PSO 1 PO 3

Course Out comes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT4CRT0219.1	U	2				2			
PBT4CRT0219.2	Ap	1				1			
PBT4CRT0219.3	U	1				1			
PBT4CRT0219.4	Ap			1					1
PBT4CRT0219.5	An			2		2			
PBT4CRT0219		1.3		1.5		1.5			1

PBT4CRT0319- Genomics, Transcriptomics, Proteomics and Bioinformatics

CO.No.	Course Outcome	Cognitive Level	PSO PO
1	Explain various methodologies in genome mapping and sequencing.	An	PSO 1,2N PO 2,3
2	Compare genome projects in different organisms	An	PSO 1,2 PO 2,3
3	Discuss the use of genomics and proteomics in human health.	An	PSO 1 PO 1
4	Apply concepts in bioinformatics for data analysis	Ap	PSO 2 PO 2
5	Develop a sense of ethics with regard to the procedures in genome analysis	Ap	PSO 3 PO 4

Course Out comes	Level of CO	Program Outcomes				Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
PBT4CRT0319.1	An		1	1		2	1		
PBT4CRT0319.2	An		2	1		1	1		
PBT4CRT0319.3	An	1				1			
PBT4CRT0319.4	Ap		1				2		
PBT4CRT0319.5	Ap				1			2	
PBT4CRT0319		1	1.3	1	1	1.33	1.33	2	

PROGRAMME ARTICULATION MATRIX, BOTANY- PG

Course Code	Course Title	Sem	Programme Outcomes (POs)				Programme Specific Outcomes (PSOs)			
			PO -1	PO -2	PO -3	PO -4	PSO -1	PSO -2	PSO -3	PSO -4
PBT1CRT0119	Microbiology Phycology	I	2	1	-	1	2	1	-	2
PBT1CRT0219	Mycology Crop pathology	I	2	1.5	-	1	2	1.3	1	1.5
PBT1CRT0319	Bryophytes Pteridophytes	I	2	-	2	2	2	-	1	1
PBT1CRT0419	Gymnosperms and Paleobotany Evolution	I	1.5	2	-	-	2	1.6	-	-
PBT2CRT0119	Anatomy Developmental Biology Horticulture	II	2	2	1	1	2	1.6	1	1
PBT2CRT0219	Cell Biology Genetics Plant Breeding	II	2	1	-	-	2	1.3	-	-
PBT2CRT0319	Plant Physiology Biochemistry	II	2	1.3	-	-	2	1.5	-	1
PBT2CRPT419	Molecular Biology	II	1.6	-	-	-	1.4	-	-	-
PBT3CRT0119	Research Methodology Micro-technique Biostatistics Biophysical Instrumentation	III	1.6 6	1.5	-	-	-	2	-	1.3
PBT3CRT0219	Biotechnology, Bioinformatics and Bio- nanotechnology	III	1	1.5	-	-	-	1.33	2	1
PBT3CRT0319	Angiosperm Taxonomy, Economic Botany and Ethanobotany	III	1.5	2	-	-	1.67	2	-	1

PBT3CRT0 4119	Environmental Science	III	1.5	1.5	1	1.5	1	1.	1.5	-
PBT4CRT0 119	Elective course IBiotechnology - Plant tissue Culture and Microbial Biotechnology	IV	2	1.5	-	1	2	2	1	1
PBT4CRT0 219	Elective course Biotechnology – Genetic Engineering, Genomics and Immunology	IV	1.3	-	1.5	-	1.5	-	-	1
PBT4CRT0 319	Elective course IBiotechnology – Genomics, Transcriptomics, Proteomics and Bioinformatics	IV	1	1.3	1	1	1.33	1.33	2	-



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