

M.Sc. Botany

Programme Outcomes of M.Sc.

- Acquire interdisciplinary knowledge and the skill of designing and conducting experiments independently in collaboration and interpreting scientific data.
- Communicate effectively, analyze critically and learn to adapt to the socio technological changes.
- Face competitive examinations that offer challenging and rewarding careers in science and education.
- Identify, formulate and critically analyze various scientific problems and design/develop solutions by applying the knowledge to different domains.

Programme Specific Outcomes

PSOs	Upon completion students of M.Sc. Botany the graduates will be able to :
PSO - 1	Explicate the role of microbes – friend and foe
PSO - 2	Apply fundamental mathematical tools and physical principles in analysing biological situations
PSO - 3	Evaluate ecological interconnectedness of life on earth
PSO - 4	Integrate theoretical and practical knowledge to develop new drugs
PSO - 5	Experience in seeking external funds for their research from a diversity of resources

Semester : III Major Core VII

Name of the Course : Taxonomy of Angiosperms and Economic Botany

Subject code : PB1731

Number of hours per week	Number of credits	Total number of hours	Marks
6	4	90	100

Course Outcomes

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO- 1	Differentiate between natural and artificial system of classification	PSO – 2, PSO - 3	U
CO- 2	Apply sketches to identify the flora	PSO -2	Ap
CO- 3	Collect and prepare herbaria for future use	PSO - 2	C
CO -4	Record the rules and regulations framed by ICBN	PSO - 2	R
CO- 5	Interpreting biological knowledge in comparing and ranking plants	PSO - 2, PSO - 3	An
CO -6	Evaluation of plants by using dichotomous keys	PSO – 2	E

Teaching Plan

Total contact hours: 60

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/ Evaluation
I CLASSIFICATION						
	1	Aim and scope of plant taxonomy – Systems of angiosperm classification; Linnaeus, Bentham and Hooker and Engler and Prantle, Merits and demerits of these classification	3	To categorize the classification of plant taxonomy	Lecture, PPT	Short test, Group discussions, Question – Answer session, Formative Assessment I.
	2	Taxonomic literatures –	3	To be aware of	Lecture,	

		floras, revisions, manuals, monographs and check lists		taxonomic literatures	Models	
	3	Identification and preparation of intended keys and bracketed keys	3	To be able to identify and prepare keys	Lecture, Models	
	4	Herbarium techniques (Seminar) – Types and functions of herbarium; Digital Herbarium	3	To know the different herbarium techniques	Lecture, Charts	
II NOMENCLATURE						
	1	Botanical nomenclature – ICN, Principles and Role of ICN, Rules – principle of priority, rejection of names, limitations in the principle of priority, typification, author citation, effective and valid publications	4	To understand the role and principle of ICN	Lecture	Short test, Assignment to learn the molecular markers
	2	Numerical taxonomy – principles, character coding, measurement of resemblance-cluster analysis, current trends in biosystematics	4	To be able to evaluate the importance of Numerical taxonomy	Lecture, PPT	
	3	Cladistics – phylogenetic approach of classification, species concept	4	To assess the approaches of Cladistics	Lecture, Models	
	4	Molecular markers as taxonomic tools – RAPD, RFLP, AFLP, ISSR (Seminar)	4	To critically analyze plants with molecular tools	Lecture, Video clippings	
III FAMILY DESCRIPTION						
	1	Objectives and importance of systematic botany; Systematic position, salient features, distribution, description and economic importance of Cappariaceae, Polygalaceae	3	To diagnose the features of different families		Quiz, Dissect and Display, Class test, Formative Assessment II.
	2	Caryophyllaceae, Tiliaceae	3	To diagnose the features of different families	Lecture, PPT, Field visit	
	3	Zygophyllaceae (Seminar)	2	To diagnose the features of the family	Lecture, PPT, Field visit	
IV FAMILY DESCRIPTION						
	1	Systematic position, salient features, distribution,	3	To diagnose the features of	Lecture, PPT,	Quiz, Dissect and Display,

		description and economic importance of Rhamnaceae, Sapindaceae		different families	Field visit	Class test
2		Passifloraceae, Sapotaceae	3	To diagnose the features of different families	Lecture, PPT , Field visit	
3		Oleaceae, (Seminar) Boraginaceae	3	To diagnose the features of different families	Lecture, PPT , Field visit	
4		Scrophulariaceae, Bignoniaceae	3	To diagnose the features of different families	Lecture, PPT , Field visit	

V FAMILY DESCRIPTION

	1	Systematic position, salient features, distribution, description and economic importance of Verbenaceae, Nyctaginaceae	3	To diagnose the features of different families	Lecture, PPT , Field visit	Quiz, Dissect and Display, Class test, Formative Assessment III.
	2	Aristolochiaceae, Casuarinaceae	3	To diagnose the features of different families	Lecture, PPT , Field visit	
	3	Orchidaceae, Commelinaceae	3	To diagnose the features of different families	Lecture, PPT , Field visit	
	4	Araceae, Cyperaceae	3	To diagnose the features of different families	Lecture, PPT , Field visit	

Course Instructor: Ms. N. Benit

HOD: Dr. C. Jespin Ida

Semester : III

Major Core VIII

Name of the Course : Genetics and Molecular Biology

Subject code : PB1732

Number of hours per week	Number of credits	Total number of hours	Marks
6	4	90	100

Course Outcomes

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO- 1	Understand the organization of cell organelles and genes	PSO – 2	U
CO- 2	Differentiate between mitochondrial DNA and chloroplast DNA	PSO - 2	U
CO- 3	Evaluate the dissociation and re-association kinetics of DNA	PSO – 2	An
CO -4	Construct different types of plasmids	PSO – 2, PSO – 3	C
CO- 5	Identify various types of operons	PSO -2, PSO – 3	R
CO -6	Analyze Transcription and Translation of Prokaryotes and Eukaryotes	PSO – 2, PSO - 5	An
CO - 7	Evaluate the problems in genetics	PSO – 2	E

Teaching Plan

Total contact hours: 60

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/ Evaluation
I GENETICS						
	1	Contribution of Johann Gregor Mendel, T.H. Morgan, Karl Landsteiner; Mendel's law of heredity – Monohybrid and Dihybrid cross (Seminar)	3	To differentiate monohybrid and dihybrid crosses and solve the problems	Lecture, Problem based learning	Formative Assessment I, Discussion.
	2	Gene interaction – Dominant epistasis (12: 3:1), Recessive epistasis (9:3:4), Duplicate recessive genes (9:7), Duplicate dominant genes (15:1)	3	Able to solve the problems in gene interaction	Lecture, Problem based learning	
	3	Sex determination in plants - theories of sex determination; Sex linked characters (Seminar)	3	To distinguish the sex linked characters	Lecture, PPT	
	4	Mutation – Types of mutation, Detection of mutation	2	To assess the different mutations	Lecture, PPT	
II DNA AND GENETIC DISEASES						
	1	DNA- types (A, B, C & Z), Watson and Crick model of DNA, viral DNA, bacterial DNA	3	To differentiate the different types of DNA	Lecture, Charts	Diagrammatic representation, Short test.
	2	Mitochondrial (Seminar) and Chloroplast DNA	2	To distinguish Mitochondrial and Chloroplast DNA	Lecture, Models	

	3	Dissociation and re-association kinetics of DNA; cot value and its significance	3	To evaluate the dissociation and re-association kinetics of DNA	Lecture	
	4	DNA replication of prokaryotes and eukaryotes	2	To understand the replication process	Lecture, Video clippings	
	5	Genetic diseases – Sickle cell anemia, Cystic fibrosis, Duchennes muscular dystrophy	3	To identify and critically analyse genetic diseases	Lecture, Video clippings	
III GENETIC ENGINEERING						
	1	Damage and DNA repair mechanism – photo reactivation – excision repair - mismatch repair	3	To understand the repair mechanisms	Lecture, PPT	Short test, Question – Answer session, Group discussion, Formative assessment II.
	2	Genetic recombination - generalised and site specific; Lysogenic and lytic cycle; Bacterial Transformation, Transduction and Conjugation	3	To analyse the recombination patterns	Lecture, Models	
	3	Cloning vectors- plasmids, cosmids, phages, plasmids – characters of plasmids, types, copy number	3	To understand the basics of cloning vector	Lecture, PPT	
	4	pBR322(Seminar), pUC9, MI3, BAC, YAC, shuttle vectors, advantages of cloning vectors	3	To differentiate the different types of cloning vectors	Lecture, Charts	
IV TOOLS IN GENETICS						
	1	RNA – types; Transcription - Initiation, elongation, termination, post transcriptional events	3	To differentiate the types of RNA	Lecture	Quiz, Group discussions
	2	Genetic code, Wobble hypothesis; Translation – steps in translation	3	To understand the process of Translation	Lecture, PPT	
	3	Molecular tools for studying genes – Autoradiography (Seminar)	3	To acquire skills to operate molecular tools	Lecture, Operating the instruments	
	4	Liquid Scintillation counting, Phosphorimaging	3	To acquire skills to operate molecular tools	Lecture, PPT	
V GENOMICS						

1	Fine structure of the gene; Transposons – Tn3, Tn5	3	To differentiate the types of transposons	Lecture, PPT	Multiple Choice Questions, Group discussions, Formative assessment III.
2	Operon concept – lac operon, trp operon, Steps in gene cloning; Pros and Cons in gene cloning	3	To understand the concepts of operon	Lecture, PPT	
3	Construction of genomic library; Construction of cDNA library	3	To construct the gene libraries	Lecture, Video clippings	
4	Gene silencing; Human Genome Project (Seminar)	3	To evaluate the human genome project	Lecture, Video clippings	

Course Instructor: Ms. J.Albino Wins

HOD: Dr. C. Jespin Ida

Semester : III Elective III (a)

Name of the Course : Forestry

Subject code : PB1733

Number of hours per week	Number of credits	Total number of hours	Marks
6	5	90	100

Course Outcomes

CO No:	Upon completion of this course the students will be able to:	PSO Address	CL
CO-1	Categorize the types of forests in Tamilnadu	PSO – 3	An
CO-2	Identify the reasons for degradation of forest	PSO – 3	R
CO-3	Summarize the methods in managing and conserving the forest	PSO - 2, PSO – 3	AP
CO-4	Understand the objectives, advantages and disadvantages of agroforestry	PSO – 3	U
CO-5	Determine the role of botanical gardens, zoos, national parks, and sanctuaries	PSO - 3, PSO – 5	U
CO-6	Evaluate the utilization of forest	PSO - 3	E

Teaching Plan

Total contact hours: 60

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/ Evaluation
I TYPES OF FOREST						
	1	Forest – definition, role of forest; forest as a balanced ecosystem	3	To understand the role of forest	Lecture	Short test, Quiz, Formative assessment I.
	2	Types and distribution of (Champion and Seth’s classification)	3	To categorize the types of forests	Lecture, PPT	
	3	Forest types in Tamilnadu (Seminar)– evergreen forest, deciduous and scrub jungle	3	To categorize the types of forests in Tamilnadu	Lecture, PPT	
II FOREST MANAGEMENT						
	1	Forest management and conservation	3	Able to understand the conservation strategies	Lecture	Assignment on forest mensuration
	2	Regeneration; tending operations; sustainable utilization of forest resources – forest organizations	4	To assess the utilization of forest resources	Lecture	
	3	Forest mensuration and remote sensing	3	To know the concept of remote sensing	Lecture, PPT	
	4	methods of measuring diameter, girth, height, and volume of trees	3	Differentiate the different methods of forest mensuration	Lecture, Video clippings	
	5	Geographic information systems for management (GIS) (Seminar)	3	To understand the concepts of GIS	Lecture	
III FOREST UTILIZATION						
	1	Forest utilization – harvesting, conservation, storage and disposal of wood in forest; major and minor forest products	3	To evaluate the utilization of forest	Lecture, PPT	Short test, Quiz, Formative assessment II.
	2	Forest based	3	To assess the	Lecture,	

		industries – paper and pulp industry, resin tapping and turpentine manufacture		importance of forest based industries	Powerpoint	
	3	Forest education in India (Seminar)	3	To know about forest education	Lecture	
IV FOREST DEGRADATION						
	1	Forest degradation – damage caused by fire, climatic factors and injuries by insects, plants, animals, and diseases	3	To understand the causes of forest degradation	Lecture, PPT	Quiz, Discussions
	2	Activities of man including encroachment and shifting cultivation	3	To know about the encroachment	Lecture	
	3	Measures to protect the forest damage caused by various factors (Seminar)	3	To assess the protective measures	Lecture, Charts	
V AGROFORESTRY						
	1	Agroforestry – objectives, advantages and disadvantages	3	To understand the basis of Agroforestry	Lecture	Quiz, Group Discussions, Formative assessment III.
	2	Energy plantations; recreational forestry	2	To assess the energy plantations	Lecture, PPT	
	3	Role of botanical gardens, zoos, national parks and sanctuaries in recreation	3	To evaluate the role of botanical gardens	Lecture, PPT	
	4	Conservation of wild life (Seminar)	3	To acquire skills in conserving wild life	Lecture, Video clippings	
	5	Social forestry	2	To evaluate the impact of social forestry	Lecture, PPT	

Course Instructor: Ms. L.Dyona

HOD: Dr. C. Jespin Ida