

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

Teaching Plan for the Academic Year 2018-2019 –Odd Semester

Semester I

Name of the Course: Plant Diversity I - Algae, Fungi, Lichens and Bryophytes

Subject Code: PB1711

No. of hours per week	Credit	Total no. 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	Identify the important contrast characters of Algae, Fungi and Lichens	PSO-1	R

CO-2	Describe ways in which lichens are beneficial to the environment	PSO-1	U
CO-3	Interpret the general characteristics of lichens	PSO-1	Ap
CO-4	Categorize the algal organisms according to Fritsch (1945)	PSO-1	An
CO-5	Correlate the study of life form, structure, reproduction and life cycle of different classes of Algae	PSO-1	E
CO-6	Recall the salient features of the different fungi	PSO-1	U

Teaching Plan

Total contact hours: 60

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/ Evaluation
1. ALGAE – GENERAL CHARACTERS						
	1	General characters of algae including similarities and diversities ; Classification of algae by Fritsch (1954); Thallus organization in algae (Seminar)	4	To identify and categorize algal organisms	Lecture	Through microscopic examination, class test, quiz, diagrammatic representation, Formative Assessment I.
	2	Life-cycle patterns and alternation of generations	3	To understand the different life cycle patterns	Lecture, Illustration	
	3	Detailed study on occurrence, habitat, structure, reproduction and life history of Cyanophyceae and Chlorophyceae	4	To correlate the different algal organisms between the two families	Lecture, Demonstration with live specimens	
II ALGAE – LIFE HISTORY						
	1	Detailed study on occurrence, habitat, structure, reproduction and life-history of Xanthophyceae, Bacillariophyceae	4	To correlate the different algal organisms between the two families	Lecture, Demonstration with live specimens	Microscopic Examination, Test and Quiz
	2	Phaeophyta (Seminar), Rhodophyceae (Seminar)	4	To correlate the different algal organisms between the two families	Lecture, Demonstration with live specimens	

	3	Fossil algae	4	To identify the fossil specimens	Lecture, Microscopic Slides	
	4	Economic importance – Role of algae in soil fertility; Algal blooms; symbiotic associations; nitrogen fixation; Pollution indicators; SCP (Seminar)	4	To understand the role of algae in different fields	Lecture	
III FUNGI – GENERAL CHARACTERS AND LIFE HISTORY						
	1	General characters of fungi; Classification of fungi proposed by C.J Alexopoulos and C.W Mims (1979)	4	To identify and categorize the fungal organisms	Lecture	Through microscopic examination and Formative Assessment II.
	2	Homothallism and Heterothallism in fungi; Parasexuality in fungi(Seminar)	4	To understand the reproduction strategies in fungi	Lecture, PPT	
	3	An overview and life history of Zygomycetes, Ascomycetes, Basidiomycetes, Deuteromycetes. Economic importance of fungi	5	To correlate the different fungal organisms between the classes	Lecture, Microscopic Slides, Live specimens	
IV LICHENS						
	1	General account of Lichens; Classification by Miller (1984)	4	To identify and categorize lichens	Lecture, PPT	Microscopic examination, test and quiz
	2	Structure, nutrition and reproduction of the three major groups – Crustose, Foliose and Fruticose; Economic importance of Lichens	5	To interpret the different groups of lichens	Lecture, Microscopic Slides, Live specimens	
V BRYOPHYTES						
	1	Classification, Distribution, Origin (including fossil evidence), Primitive and advanced features of Bryophytes	3	To identify and categorize the bryophytes	Lecture, Illustration	Class test, Question and Answer session, Diagrammatic representation, Discussion, Formative Assessment III.
	2	Evolution of gametophytes and sporophytes; Ecological adaptations; Economic importance (Seminar)	4	To understand the evolution and importance of bryophytes	Lecture, Illustration	
	3	A comparative study of	4	To correlate the	Lecture,	

	the morphological and anatomical features of Polytrichales, Bryales, Marchantiales, Jungermanniales and Anthocerotales.		different bryophytes between the orders	Microscopic slides, Live specimens	
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Course Instructor: Ms. Angel Sophia

HOD: Dr. C. Jespin Ida

Semester: I

Name of the Course: Microbiology, Immunology and Plant Pathology

Subject code: PB1712

No. of hours per week	Credit	Total no. 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 basic structure and growth techniques of different microorganisms	PSO – 1	U
CO- 2	Apply some modern techniques to detect antigen and antibodies.	PSO – 2, PSO – 4	Ap
CO- 3	Identify and treat the pathogens on economically important plants	PSO – 3	R
CO -4	Evaluate the role of antimicrobial drugs and its resistance	PSO – 4, PSO -5	E
CO- 5	Analyze the bacteria present in milk, soil and water.	PSO – 1,PSO - 3, PSO – 5	An
CO -6	Construct a protocol for identification of Gram positive and Gram negative bacteria	PSO -1, PSO -2	C

Teaching Plan

Total contact hours: 60

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/ Evaluation
I BACTERIA						
	1	General properties of bacteria; Morphology and fine structure of Bacteria	3	To understand the basic structure of bacteria	Lecture, chart	Microscopic observation, Class Test, Group Presentation,
	2	Classification of bacteria as per Bergey's Manual of Systematic Bacteriology	3	To categorize the bacterial species	Lecture, PPT	Formative Assessment I.

	3	Bacterial Growth curve; Sterilization and disinfection; Culture media and its types	3	To know the growth dynamics and culture patterns of bacteria	Lecture, Illustration, Hands on training	
	4	Methods of isolation - Pure culture; Identification of bacteria(Seminar)	4	To maintain pure culture and identification of Gram positive and Gram negative bacteria	Lecture, Models	

II VIRUS AND ANTIMICROBIAL DRUGS

	1	General properties of Viruses; (Seminar) Classification and nomenclature; Structure of virus; Cultivation of virus;	4	To categorize viruses and cultivate them	Lecture	Diagrammatic representation, Question – answer session, class test
	2	Morphology of bacteriophages; life cycle – Lytic cycle and Lysogenic cycle	3	To understand the basic structure and life cycle of bacteriophages	Lecture, Charts	
	3	General properties of Actinomycetes and Mycoplasma	4	To know about the characters of Actinomycetes and mycoplasma	Lecture	
	4	General characteristics of antimicrobial drugs; Antibacterial drugs – Sulfonamides, Penicillins; Drug resistance	4	To evaluate the different antimicrobial drugs	Lecture, PPT	

III MICROBIAL FLORA OF SOIL, WATER AND MILK

	1	Microbial flora of soil - Significance of soil microorganisms. Microbial flora of municipal water and its Purification	4	To know the significance of bacteria in soil and water	Lecture, Group Discussion	Formative assessment II, Multiple choice questions
	2	Bacteriological examination of drinking water; Microbial flora of milk - Pasteurization of milk; Phosphatase Tests for grading milk sample (Seminar)	3	To analyze the bacteria present in milk and water	Lecture, Lab test	
	3	Food spoilage by	4	To know about the	Lecture,	

		bacteria – <i>Clostridium botulinum</i> , (Seminar) <i>Salmonella sps</i> , <i>Shigella sps</i> , <i>Staphylococcus sps</i>		food spoilage organisms	PPT	
IV IMMUNOLOGY						
	1	Immunity – Definition and its types; Properties of Antigens; Antibodies – Basic structure and its types	3	To understand the properties of antigens and antibodies	Lecture, PPT	Lab tests, Class tests
	2	Strength of Antigen - Antibody interactions; Agglutination reactions; Precipitation reactions	3	To learn antigen-antibody interactions	Lecture, Experimental learning	
	3	Cytokines - Properties and attributes; Monoclonal antibody production	3	To know about cytokines and monoclonal antibodies	Lecture, Group discussion	
	4	Immunodiffusion; ELISA (Seminar); Immune response during bacterial (Tuberculosis), parasitic (Malaria) and viral (HIV) infections.	3	To apply the techniques to detect the antigens	Lecture, PPT	
V PLANT PATHOLOGY						
	1	Classification of plant diseases - Symptoms - Infection process - Host parasite interaction - Defense mechanisms in plants	3	To identify the plant pathogens	Lecture	Class tests, Group discussions, Formative Assessment III.
	2	Disease control methods - Physical, chemical, Cultural and Biological - Integrated disease management.	2	To understand the disease control strategies		
	3	Detailed study of the plant diseases- Citrus	3	To know about different plant		

		cancer, White rust disease, Blast of rice, Red rot of Sugercane (Seminar), Little leaf of Brinjal		diseases		
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Course Instructor: Ms. J. Albino Wins

HOD: Dr. C. Jespin Ida

Semester : **I** **Major Core III**

Name of the Course : **Developmental Botany**

Subject code : **PB1713**

No. of hours per week	Credit	Total no. 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 an over view of the basic concepts of developmental botany	PSO - 3	U
CO- 2	Determine the phylogenetic trends and specialization of xylem and phloem	PSO -2, PSO - 3	U
CO- 3	Describe the anomalous secondary growth in <i>Bougainvillea</i> , <i>Bignonia</i> , <i>Achyranthes</i> , and <i>Dracaena</i>	PSO - 2	U
CO -4	Analyze the properties of wood	PSO - 2, PSO - 5	An
CO- 5	Categorize the types of embryo sac	PSO - 2, PSO - 5	An
CO -6	Understand the barriers of fertilization	PSO - 2	U
CO - 7	Explain the structural changes in seed development	PSO - 2	U

Teaching Plan

Total contact hours: 60

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/ Evaluation
I INTRODUCTION						
	1	Introduction to Developmental Botany- Nuclear- Cytoplasmic interaction	3	To learn the basics of Developmental Botany	Lecture, Charts	Tests, Discussions, Group presentations,

	2	Division- Differentiation- Polarity and Symmetry (Seminar)	3	To differentiate about Polarity and Symmetry	Lecture, Charts	Formative Assessment I.
	3	Organization of Shoot Apical Meristem (SAM) and Root Apical Meristem (RAM)	3	To understand the organization of SAM and RAM	Lecture, Question – Answer sessions	
	4	Vascular cambium- origin, structure and seasonal activity	3	To know about Vascular cambium	Lecture, PPT	
II COMPLEX TISSUE AND SECONDARY GROWTH						
	1	Xylem, Phloem and their elements- primary and secondary structures, phylogenetic trends and specialization of xylem and phloem	4	To differentiate the primary and secondary structures of Xylem and Phloem	Lecture, PPT	Class test, Quiz, Group discussions
	2	Secondary growth- Periderm- structure- development of lenticels (Seminar)	3	To know about the Secondary growth patterns	Lecture, Illustration	
	3	Anomalous secondary growth- Bougainvillea, Bignonia, Achyranthes and Dracaena	4	To differentiate the Anomalous secondary growth of different plants	Lecture, Models	
III WOOD ANATOMY						
	1	Wood anatomy- physical, chemical and mechanical properties. Defects in wood- natural defects, knots and defects due to diseases	3	To know the basics of wood anatomy	Lecture	Class tests, Multiple choice questions, Quiz, Formative Assessment II.
	2	Reaction wood- Tension and Compression wood- Durability of wood (Seminar)	4	To understand about the Reaction wood	Lecture, Models	
	3	Ontogeny of dicot and monocot leaves. Differentiation of epidermis with special reference to stomata and trichomes	4	To differentiate epidermis with stomata and trichomes	Lecture, Charts	
IV MICROSPOROGENESIS AND MEGASPOROGENESIS						
	1	Microsporogenesis Pollen morphology- pollen wall- pollen development- pollen dimorphism- pollen storage, pollen allergy. - Pollen- Pistil interaction	5	To know about the Basics of Pollen morphology	Lecture, Charts and models	Assignment on different structures of pollen, Class tests

		(Seminar)- structure of style- stigma and significance				
	2	Megasporogenesis. Different types of embryo sac development- fertilization- barriers of fertilization	5	To evaluate the different types of embryo sacs	Lecture, Group discussions	
	3	Self- incompatibility- types, physiology and biochemistry, methods to overcome self- incompatibility	4	To understand about Self- incompatibility	Lecture	

V FERTILIZATION

	1	Fertilization- changes, physiological and biochemical changes during maturation. Seed- seed coat development and specialization	4	To analyze the fertilization changes	Lecture, PPT, Group discussion	Short test, Discussion, Formative Assessment III.
	2	Endosperm- types- haustoria. Embryogenesis and organogenesis of dicot and monocot embryos	4	To differentiate the different types of endosperm	Lecture, Charts	
	3	Apomixis- Polyembryony- parthenocarpy (Seminar)	4	To evaluate the importance of apomixes, Polyembryony, parthenocarpy	Lecture, Models	

Course Instructor: Ms. N. Benit

HOD: Dr. C. Jespin Ida

Semester : I Elective I (a)

Name of the Course : Marine Biology

Subject code : PB1714

No. of hours per week	Credit	Total no. of hours	Marks
6	5	90	100

Course Outcomes

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO- 1	Understand the potentiality of marine diversity	PSO - 1	U

CO- 2	Recall the usage of different marine products	PSO – 1, PSO – 3	R
CO- 3	Construct a protocol for sampling and cultivating marine organisms	PSO – 1, PSO – 5	C
CO -4	Analyse the different types of pollution in marine environment	PSO – 1, PSO - 3	An
CO- 5	Detect different bioactive compounds from marine organisms	PSO – 1, PSO - 4	An
CO -6	Relate the structure, reproduction and ecological roles of mangroves, sea grasses, corals and salt marsh plants	PSO – 1, PSO - 3	Ap

Teaching Plan

Total contact hours: 60

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/ Evaluation
I. MARINE HABITAT						
	1	Classification of marine habitat – pelagic – neritic and oceanic province, benthic – zonation – shore environment – muddy, rocky and sandy, waves and tides, deep sea bottom – pelagic deposits (Seminar)	4	To understand the basics of marine habitat	Lecture	Formative assessment I, Group discussions, Quiz.
	2	Characteristics of marine habitat – physical parameters – temperature, illumination, specific gravity, pressure and buoyancy, ocean current	3	To know about the characteristics of marine habitat e	Lecture, PPT	
	3	Chemical constituents – major and minor constituents, deep sea nodules. Plate tectonics – earthquakes and tsunami.	3	To be able to evaluate the causes and preventive measures of Plate tectonics	Lecture, Charts, Discussion	
II MARINE BIODIVERSITY						
	1	Marine biodiversity – phytoplankton – characteristics, sampling and measuring.	4	To understand the basics of Marine biodiversity	Lecture, PPT	Assignments on marine diversity, Group discussions, Quiz
	2	Marine bacteria, marine fungi, seaweeds and sea grasses (Seminar)	3	To evaluate the importance of marine organisms	Lecture, Illustrations	
	3	Energy relationship – primary production, grazing food chain,	4	To be able to understand the Energy	Lecture, Charts	

		detritus chain and energy balance sheet		relationship		
	4	Green house effect, Carbon pump	3	To evaluate the impact of Green house effect	Lecture, Illustrations	
III MARINE PRODUCTS						
	1	Marine products – Production and uses of Agar-agar, Alginates, Carrageenan; Marine lipids	4	To produce marine products	Lecture, Illustrations	Class tests, Question – Answer sessions, Formative Assessment II.
	2	Marine pharmacology – Bioactive compounds from marine organisms	4	To assess bioactive compounds from marine organisms	Lecture, PPT	
	3	Sea grasses – structure, reproduction and ecological roles (Seminar)	4	To know about sea grasses	Lecture, Charts	
IV MICROALGAE						
	1	Culture of microalgae – Open pond method, Photobioreactors, Batch culture, Continuous culture	4	To acquire skills to culture microalgae	Lecture, PPT	Class tests, Case study on different pollutions in different areas
	2	Maintenance of culture – Stock culture and Sub culture; Commercial cultivation of seaweeds	4	To assess the maintenance of culture	Lecture, Illustration	
	3	Marine pollution – thermal pollution, oil pollution, heavy metal pollution, radioactive pollution ; Eutrophication (Seminar)	4	To analyse the impact of marine pollution	Lecture, Group discussions	
V MANGROVES						
	1	Mangroves - Structure, Reproduction and ecological roles (Seminar)	3	To understand about mangrove ecosystem	Lecture, PPT	Class tests, Question – Answer sessions, Group discussions, Formative Assessment III.
	2	Present status of mangroves with special reference to Pitchavaram	3	To recall the status of mangroves in Pitchavaram	Lecture	
	3	Salt marsh plants – Structure, Adaptations and ecological roles; Restoration of mangroves	3	To understand about Salt marsh plants	Lecture, PPT	
	4	Coral reefs – Formation,	3	To assess the	Lecture,	

		Types, Ecology, Species interaction and economic importance		importance of Coral reefs	Charts	
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Course Instructor: Ms. J. Albino Wins

HOD: Dr. C. Jespin Ida

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 Capparidaceae, 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,
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		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	

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