Teaching Plan

Semester - V

Name of the course: Taxonomy and Economic Botany

Sub. Code: BC1751

Number of Hours Per week	Number of Credits	Total Number of Hours	Marks
6	5	90	100

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO - 1	Relate the modifications in plant parts	PSO - 7	U
CO - 2	Evaluate the taxonomists of India	PSO - 1	Ev
CO - 3	Differentiate the artificial, natural and phylogenetic classification and learn about ICN rules	PSO - 1	An
CO - 4	construct digital herbarium and learn about Herbarium techniques	PSO - 5	C
CO - 5	Recall the characters of some important families	PSO - 6	R
CO - 6	Understand the economic importance of plants and their use at various levels	PSO - 1	U

Unit	Module	Topics	Lecture Hours	Learning outcome	Pedagogy	Assessment/ Evaluation
I	**Morphological modifications and contribution by taxonomists**					
	1.	Objectives and importance of systematic botany	2	To realizethe objectives and importance of systematic botany	Lecture	Class test Formative assessment
	2.	Morphology of root, stem, leaf and their modifications.	4	To differentiate the morphology of root, stem and leaf and their modifications	Lecture Demonstration with live Specimens	
	3.	Morphology of inflorescence, flower, fruit and their modifications	5	To learn about the different types of inflorescence, flower and fruit	Lecture Demonstration with live Specimens	

	4.	Contribution to systematic botany by Indian Taxonomist – K.M. Mathew	2	To study the renowned contribution of K.M Mathew in the field of Indian taxonomy	Lecture using chalk and board	
	5.	Contribution to systematic botany by Indian Taxonomist – HermenegildSantapau	2	To appreciate the contribution to systematic botany by HermenegildSantapau's	Lecture using chalk and board	
II	**Different systems of classification, principles of ICN and herbarium techniques**					
	1.	Systems of classification; Artificial – Linnaeus Natural – Bentham and Hooker Phylogenetic - Engler and Prantle merits and demerits	4	To gain knowledge on different types of classification	Lecture PPT	Quiz Class Test Multiple choice questions
	2.	APG Classification – an outline	3	To know the classification of families based on DNA sequences	Lecture and group discussion	
	3.	Chemotaxonomy	2	To categorizeplants on the basis of secondary metabolites present	Lecture using chalk and board	
	4.	Nomenclature – Binomial system	2	To understand *binomial system of nomenclature*	Lecture group discussion	
	5.	Principles of ICN Type method, Principle of priority and Author citation Effective and valid publication	3	To know the principles of ICN in detail	Lecture PPT	

	6.	Herbarium techniques. Digital Herbarium	1	To learn different herbarium techniques	Lecture Demonstration	
III	**Detailed study of the following families with their economic importance**					
	1.	Detailed study of the family Annonaceae with their economic importance	3	To understand the distinguishing features and economic importance of the family Annonaceae	Lecture Demonstration	Formative assessment Quiz Short test Assignment
	2.	Detailed study of the family Brassicaceae with their economic importance	2	To understand the distinguishing features and economic importance of the family Brassicaceae	Lecture PPT	
	3.	Detailed study of the family Rutaceae with their economic importance	2	To understand the distinguishing features and economic importance of the family Rutaceae	Lecture Chalk and board	
	4.	Detailed study of the family Meliaceae with their economic importance	3	To understand the distinguishing features and economic importance of the family Meliaceae	Lecture PPT	
	5.	Detailed study of the family Caesalpiniaceae with their economic importance	2	To understand the distinguishing features and economic importance of the family Caesalpiniaceae	Lecture demonstration	
	6.	Detailed study of the family Myrtaceae with their economic importance	3	To understand the distinguishing features and economic importance of the family Myrtaceae	Lecture demonstration	
IV	**Detailed study of the following families with their economic importance**					
	1.	Detailed study of the family Cucurbitaceae with their	3	To learn the distinguishing features and economic importance of the	Lecture Group discussion	Short test Multiple choice questions

		economic importance		family Cucurbitaceae		Quiz Assignment
	2.	Detailed study of the family Rubiaceae with their economic importance	3	To know the distinguishing features and economic importance of the family Rubiaceae	Lecture chalk and board	
	3.	Detailed study of the family Solanaceae with their economic importance	3	To understand the distinguishing features and economic importance of the family Solanaceae	Lecture demonstration	
	4.	Detailed study of the family Sapotaceae with their economic importance	2	To learn the distinguishing features and economic importance of the family Sapotaceae	Lecture Group discussion	
	5.	Detailed study of the family Apocynaceae and Asclepiadaceae with their economic importance	4	To know the distinguishing features and compare the characters of both the families - Apocynaceae&Asclepiadaceae	Lecture Demonstration	
V	**Detailed study of the following families with their economic importance**					
	1.	Detailed study of the family Lamiaceae with their economic importance	3	To know the distinguishing features and economic importance of the family Lamiaceae	Lecture demonstration	Quiz Formative assessment Short test
	2.	Detailed study of the family Euphorbiaceae with their economic importance	3	To learn the distinguishing features and economic importance of the family Euphorbiaceae	Lecture demonstration	

	3.	Detailed study of the family Amaranthacea e with their economic importance	3	To understand the distinguishing features and economic importance of the family Amaranthaceae	Lecture group discussion	
	4.	Detailed study of the family Arecaceae with their economic importance	2	To learn the distinguishing features and economic importance of the family Arecaceae	Lecture demonstrati on	
	5.	Detailed study of the family Cannaceaeand Orchidaceaewi th their economic importance	2	To know the distinguishing features and compare the characters of both the families – Cannaceae& Orchidaceae	Lecture PPT	
	6.	Detailed study of the family Poaceae with their economic importance	2	To learn the distinguishing features and economic importance of the family Poaceae	Lecture demonstrati on	

Course Instructor: Dr. Bojaxa A. Rosy **HOD: Dr. C. Jespin Ida**

Name of the Course: Biochemistry and Biophysics

Sub. Code: BC1752

Number of Hours Per week	Number of Credits	Total Number of Hours	Marks
6	5	90	100

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	identify the levels of structure in proteins and describe its biological roles	PSO - 3	R
CO - 2	understand the structure, properties and fundamentals of biomolecules	PSO - 3	U
CO - 3	demonstrate thermodynamic principles in biological energy conversion	PSO - 4	Ap
CO - 4	analyze enzyme activity	PSO - 9	An
CO - 5	compare the structure of saturated fatty acids with unsaturated fatty acids	PSO - 9	E
CO - 6	analyse the biological data and interpret data with the hypothesis	PSO - 3	An

Unit	Module	Topics	Lecture Hours	Learning out come	Pedagogy	Assessment/ Evaluation
I	**Carbohydrates**					
	1	Types ofbonds	2	Distinguish the different types of bonds under study	Lecture Illustration	Short test Quiz Assignment on applications. Formative assessment
	2	P^H and Buffer	2	Evaluate the importance of buffer in biological systems	Experimental learning	
	3	Monosaccharides structure and properties of glucose and fructose Isomers of monosaccha	5	Learn the structure and properties selected monosaccharides	Lecture with PPT	

		rides				
	4	Disaccharides- structure and properties of maltose, Sucrose and Lactose	3	Analyze the structure and properties of disaccharides	Lecture with PPT	
	5	Polysaccharides- structure and properties of starch and cellulose	3	Compare the structure and properties of homo and hetero polysaccharides	Lecture with PPT	
II	**Proteins and Vitamins**					
	1	Amino Acids structure and properties	3	Know the importance of Amino Acids	Lecture with PPT	Short test Quiz Short questions Multiple choice questions Formative assessment Multiple Choice Questions
	2	Protein- Primary and secondary structure and properties	3	Explain the different bonds involved in primary and secondary structure of proteins	Lecture with PPT	
	3	Protein - tertiary and quaternary structure; Biological roles of proteins	3	Learn the structure of myoglobin and haemoglobin and biological functions of Proteins	Lecture with PPT	
	4	Vitamins - structure, importance, sourcesand deficiency symptoms of Thiamine, riboflavin and niacin	3	Analyze the structure and importance of thiamine, riboflavin and niacin	Lecture Discussion with PPT illustration	
	5	Fat soluble	3	Understand the	Lecture Group	

		vitamins- A, D and Ergosterol		fat-soluble vitamins and its importance	Discussion	
III	**Lipids and Nucleic Acids**					
	1	Lipids - classification and properties	3	Understand the classification of lipid based on its characteristics	Illustration Lecture	Short Test Short questions Quiz Multiple Choice Questions Formative assessment
	2	Fatty acids structure and functions essential fatty acids.	3	Discuss the structure and properties of fatty acids and their biological functions	Lecture PPT	
	3	General account of lipids (simple lipids Compound lipids and derived lipids)	3	Compare the structure and properties of triglycerides, phospholipids and cholestrol	Lecture Discussion	
	4	Nucleic acids- Structure of DNA	2	To study the double helical model of DNA structure (Watson and Crick)	Brain Storming Lecture	
	5	Nucleic acids- Structure of RNA.	4	Differentiate the structure and role of tRNA, mRNA and rRNA	PPT 3D structure Lecture	
IV	**Enzymes**					
	1	Nomenclature and classification of enzymes	3	Discuss the classification, nomenclature of enzyme	Illustration Lecture	Listing out important terms Slip test Formative assessment Short test Quiz Formative Assessment
	2	Structure of enzymes Activesite	3	Understand the role of active site in an enzyme	Lecture PPT	
	3	Cofactors, coenzymes,	3	Compare the role of cofactors,		

		isoenzyme		coenzymes, isoenzyme		
	4	Mechanism of enzyme action (activation energy, lock and key hypothesis, Induced - fit theory),	3	Analyze the mode of action of enzyme	Lecture PPT	
	5	Enzyme inhibition and factors affecting enzyme activity	3	Recall the inhibitory properties of enzymes	Lecture PPT	
V	**Bioenergetics**					
	1	Laws concept of free energy, endergonic and exergonic reactions, coupled reactions and redox reactions.	3	Analyse the law of thermodynamics and concepts of energy	Lecture, PPT Group discussion	Quiz Formative Assessment Short test Open book test Slip test
	2	ATP: structure, its role as a energy currency molecule	3	Imbibeknowledge on the role of ATPin human body	Lecture PPT	
	3	Photobiology - Dual nature of light and its characteristics.	2	Know the dual nature of light	Lecture	
	4	Electro Magnetic Spectrum, Action and Absorption	3	Compare the different types of spectrum based on their function	Lecture PPT Group discussion	

		spectrum,.				
	5	Emission spectrum – excitation and de-excitation Phosphorescence, fluorescence and bio-luminescence.	4	Differentiate different types of light emissions	Lecture PPT	

Course Instructor: Dr. Sr. P. Leema Rose HOD: Dr. C. Jespin Ida

Name of the Course : Microbiology and Plant Pathology
Subject Code : BC1753

Number of Hours Per week	Number of Credits	Total Number of Hours	Marks
5	4	75	100

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO - 1	be familiarize with basic information about microbiology and microbiologists	PSO - 1	U
CO - 2	explore the role and relevance of viruses and bacteria in the field of microbiology	PSO - 4	Ap
CO - 3	work safely, competently and effectively in the microbiology laboratory	PSO - 9	An
CO - 4	undertake careers in microbiology through the hands – on - training techniques they learnt	PSO - 3	C
CO - 5	recognize the signs and symptoms of important plant diseases and the major issues that arise due to such infections	PSO - 7	U

Unit	Module	Topics	Lecture Hours	Learning Outcome	Pedagogy	Assessment /Evaluation
Bacteria- Structure, Nutrition and Reproduction						
I	1	Bacteria- size, shape and arrangement	2	To be familiarize with different types of bacteria	Lecture PPT Microslides	Formative Assessment Quiz Short test
	2	Bacterial cell wall and cytoplasmic membrane	3	To know theE.M structureof bacterial cell	Lecture Charts	
	3	Bacterial flagella, pili, capsule and mesosomes	2	To study the different types bacterial cell components	Lecture Illustration	
	4	Nutritional type of bacteria	2	To differentiate bacteria based on their mode of nutrition	Lecture Group Discussion	
	5	Reproduction in bacteria	3	To understand the bacterial reproduction	Lecture Models	
Contribution of microbiologists, Virus-Structure, reproduction and types						
II	1	Contribution of Leeuwenhoek, Pasteur and Koch	4	To apprehend the valuable contribution of microbiologists	Lecture Group discussion	Formative assessment Quiz Multiple choice questions Short test
	2	Virus- General Characters	2	To understand the characters of virus	Lecture Debate	
	3	Reproduction in bacteriophage	2	To differentiate lytic cycle from lysogenic cycle	Lecture PPT	
	4	Structure of DNA virus	2	To study the structure of T-phage DNA virus	Lecture Chart	
	5	Structure of RNA virus	2	To differentiate DNA from RNA virus	Lecture PPT	
Growth of Microorganisms, Sterilization Methods						
III	1	Growth Curve, Pure, batch and continuous culture	3	To comprehend growth of microorganisms	Lecture Demonstration	Formative Assessment Quiz Assignment
	2	Characteristics of bacteria	2	To perceive the characteristic features of bacteria	Lecture Chart	
	3	Physical and chemical agents for controlling	2	To be familiar with the various	Lecture PPT	

		microorganisms		physical and chemical agents to control the growth of microorganisms		
	4	Dry and wet sterilization	2	To know the types of sterilization methods	Lecture Demonstration	
	5	Working principles of Autoclave, Laminar Air Flow and Incubator	3	To study the principles, working mechanisms and uses of various microbiologicaleq uipments	Lecture Hands on training	
Food, Dairy and Water Microbiology						
IV	1	Food spoilage through microbes	2	To assay the food spoiled by microbes	Lecture Demonstration	Formative assessment Quiz Short test Testing their Practical skill
	2	Food borne infections and preventions- Botulism and Salmonellosis	3	To perceive food borne infection and treatment	Lecture PPT	
	3	Sources of milk contamination Test for grading milk	2	To create an awareness about sources of milk contamination and milk grading	Lecture Demonstration	
	4	Pasteurization technique	2	To understand the steps involved in pasteurization	Lecture Field Visit	
	5	Portable and nonportable water	1	To identify portable andnon-portable water	Lecture Group Discussion	
	6	Test for detection of coliform bacteria	2	To test coliform bacteria in water	Lecture Hands on training	
Plant Pathology, Study of selected plant diseases						
V	1	Introduction to plant pathology	2	To realize the importance of plant pathology	Lecture	Class test Multiple choice questions Formative assessment Identification of diseased
	2	Causal organism, symptoms, dissemination, disease cycle and control measures of citrus	2	To apprehend the characters of citrus canker and its prevention	Lecture PPT Specimen	

		canker				plants
	3	Causal organism, symptoms, dissemination, disease cycle and control measures of bunchy top of banana	2	To know the disease cycle and prevention measures of bunchy top of banana	Lecture Specimen Chart	
	4	Causal organism, symptoms, dissemination, disease cycle and control measures of tikka disease of ground nut	2	To grasp the microorganism involved in tikka disease of ground nut	Lecture PPT	
	5	Causal organism, symptoms, dissemination, disease cycle and control measures of red rot of sugarcane	2	To be aware of red rot of sugarcane and its disease cycle	Lecture Specimen	
	6	Causal organism, symptoms, dissemination, disease cycle and control measures of late blight of potato	2	To study life cycle of fungus that infects potato and causes the late blight disease	Lecture Group Discussion	

Course Instructor: Dr.A.Anami Augustus Arul H.O.D: Dr.C.Jespin Ida

Name of the course: Biological techniques(c)

Sub. Code: BC1756

Number of Hours Per week	Number of Credits	Total Number of Hours	Marks
5	5	75	100

CO	Upon completion of this course the students will be able to :	PSO addressed	CL
CO - 1	determine the basic principles and techniques of instrument used in biology	PSO - 1	U
CO - 2	apply the skill ofmicrotechniques in preparing permanent slides	PSO – 3,5	Ap
CO - 3	understand the basic units of measurement	PSO - 1	U

CO - 4	recall the structure and functions of given instruments and develop creative skills for establishment	PSO – 6,9	R,C
CO - 5	demonstrate, use the techniques, skills, and tools necessary in research	PSO – 3,6	Ap
CO - 6	handle the biological instruments properly, competently and effectively in the laboratory	PSO - 9	An

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/ Evaluation
Microscopy and micrometry						
I	1	General introduction of Microscopy and micrometry	2	To Know the importance of Microscopy and micrometry	Lecture	Assessing their knowledge through simple questions Formative assessment Short test
	2	Principles and techniques of Light microscope	3	To understand the working mechanism of Light microscope	Lecture Illustrations	
	3	Principles and techniques of EM	2	To study the Principles, specimen preparation for EM	Lecture, Video clippings	
	4	Principles and techniques of TEM and SEM	3	To be familiarize the Principles, working mechanism and comparison of TEM and SEM	Lecture Video clippings	
	5	Principles and techniques of Fluorescent microscopy	2	To study the principle and the applications of Fluorescent microscope	PPT presentation	
Microtechniques						
II	1.	Introduction to microtechniques	1	To recall the scope ofmicrotechnique	Chalk and talk method	Formative assessment Quiz Assessing
	2.	Aims, types and mechanism of fixation and common cytological fixatives	3	To understand the importance of fixation and common fixatives	Lecture	

	3.	Dehydration, embedding and sectioning with rotary microtome. Types of stains and staining; mechanism of staining	5	To learn and demonstrate the various stepsinvolved in permanent slide preparation	Demonstration	their practical knowledge
	4.	Principles and methods of microphotography	3	To understand the Principles and methods of microphotography	PPT Presentation	
Basic units and Centrifugation						
III	1	Introduction to basic units	1	To know the basic units of weights	Lecture	Quiz
	2	Atomic weight, molecular weight, Gram molecular weight, Equivalent weight and Gram equivalent weight	4	To differentiate the various units of weight	Lecture; Chalk and talk	Group discussion
	3	Preparation of solutions: Molar (M), Normal (N), Weight - volume per cent w/v, osmolar, molal (m), parts per million(ppm).	4	To learn the preparation of Normal and Molar solutions	Demonstration	Solving problem related to preparation of different concentrations of solutions
	4	Ultracentrifuge-Basic principles, types and their applications	3	To know the Centrifugation techniques, principle and working mechanism of Ultracentrifuge	Chalk and talk method	
Instrumentation						
IV	1.	Structure and functions of pH meter	2	To understand basic principle, working mechanism and usage ofpH meter	Lecture Demonstration	Group discussion Short test
	2	Structure and functions of Colorimeter	2	To understand the aim and working mechanism of	Lecture Demonstration	Assessing their practical knowledge

				Colorimeter		
	3.	Introduction to Spectroscopic techniques	2	To know the principles of light absorption	Lecture with PPT	
	4.	Basic principlesand laws of UV-Vis spectrophotometry	3	To study the working mechanism and application ofUV-Vis spectrophotometry	Lecture with demonstration	
	5.	Principle and working mechanism of Atomic Absorption Spectrophotometer	3	To learn theworking mechanism of Atomic Absorption Spectrophotometer	Lecture Video clippings	
Chromatographic & Electrophoretic Techniques						
V	1	Basic principles and applications of Paper ChromatographyandThin Layer Chromatography	2	To understand the principles behind the separation of phytochemicals through Thin Layer Chromatography	Lecture Demonstration	Group Discussion Formative assessment, Quiz Short test
	2	Basic principles and applications of Column Chromatography	2	To know the principles and applications of Column Chromatography	Lecture PPT	
	3	Basic principles and applications of HPLC	2	To study the basic principles and applications of HPLC	Lecture and PPT	
	4	Principles, types and applications of Agarose gel electrophoresis	2	To realize the principle and applications of Agarose gel electrophoresis	Lecture Video clippings	
	5	Principles, types and applications of Native PAGE and SDS –PAGE electrophoresis	2	To understand the Principles, types and applications of PAGE electrophoresis	Lecture PPT	

Course Instructor: Dr. A. R. Florence HOD: Dr. C. Jespin Ida