STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

COURSE PLAN (November 2024 – April 2025)

Department : BIOTECHNOLOGY

Name/s of the Faculty : DR. ARUNA SHARMILI S AND DR. J. ANBUMALARMATHI

Course Title : ANIMAL AND PLANT BIOTECHNOLOGY

Course Code : 23BY/PC/AP24

Shift : II

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	recall the basics of animal/plant biotechnology	K1, K2
CO2	apply the concepts of animal/plant biotechnology	K3
CO3	analyse the various techniques of animal/plant biotechnology	K4
CO4	evaluate the developments in animal/plant biotechnology in various fields of biology	K5
CO5	create new techniques/applications in plant and animal biotechnology	K6
	CL – Cognitive Level K1 – Remember | K2 – Understand | K3 – Apply | K4 – Analyse | K5 – Evaluate | K6 – Create	

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods

Nov 18 – 25, 2024 (Day Order 1-6)	1 3	**Animal Biotechnology** **Cell Culture Technology-I** 1.1 Type of Cell Culture Facilities, SOP, GLP **Plant Tissue Culture** 3.1 Plant Tissue Culture - Principles and Methodology, Protoplast Technology and Somatic Embryogenesis	K1- K4 K1- K4	3 3	1-3 1-3	Lecture and PowerPoint presentation Lecture and PowerPoint presentation	Group discussion, Flipped classroom (GLP) Group discussion
Nov 26- Dec 3, 2024 (Day Order 1 to 6)	1 3	**Animal Biotechnology** **Cell Culture Technology-I** 1.2 Culture Vessels and Substrates **Plant Tissue Culture** 3.2 Somaclonal Variation, Synthetic Seeds	K3-K4 K2-K5	3 3	2-3 1-4	Lecture and PowerPoint presentation Lecture and PowerPoint presentation	Cooperative learning Experiments
Dec 4-11, 2024 (Day Order 1 to 6)	1 3	**Animal Biotechnology** **Cell Culture Technology-I** 1.3 Types of Cell Culture Media and Supplements **Plant Tissue Culture** 3.2 Screening of Secondary Metabolites 3.3 Production of Haploid Plants	K3-K5 K2-K5 K3-K6	3 1 2	2-4 1-4 2-5	Lecture and PowerPoint presentation Lecture and PowerPoint presentation	Quiz Test (Short answers)

Dec 12-19, 2024 (Day Order 1 to 6)	1 3	**Animal Biotechnology** **Cell Culture Technology-I** 1.3 Types of Cell Culture Media and Supplements 1.4 Media Preparation and Sterilization **Plant Tissue Culture** 3.3 Germplasm Conservation 3.4 Applications of Tissue Culture in Agriculture	K3-K6 K3-K6 K3-K6 K4-K6	2 1 1 2	2-5 2-5 2-5 3-5	Lecture and PowerPoint presentation Lecture and PowerPoint presentation	Group discussion Case analysis
Dec 20, 2024 (Day Order 1)	1	**Animal Biotechnology** **Cell Culture Technology-I** 1.4 Media Preparation and Sterilization	K3-K6	1	2-5	Lecture and PowerPoint presentation	MCQ
Jan 3 – 7, 2025 (Day Order 3 to 6)	1 3	**Cell Culture Technology-I** 1.4 Media Preparation and Sterilization **Plant Tissue Culture** 3.4 Applications of Tissue Culture in Agriculture, Horticulture	K3-K6 K4-K6	1 3	2-5 3-5	Lecture and PowerPoint presentation Lecture and PowerPoint presentation	MCQ Group discussion

Jan 8 – 17, 2024 (Day Order 1 to 6)	1 2 4	**Cell Culture Technology-I** 1.4 Media Preparation and Sterilization **Cell Culture Technology-II** 2.1 Type of Cell Culture **Plant Genetic Transformation Techniques** 4.1 Selectable and Scoreable Markers, Reporter Genes and Promoters Used in Plant Vectors	K3-K6 K1-K3 K1-K3	1 2 3	2-5 1-2 1-2	Lecture and PowerPoint presentation Lecture and PowerPoint presentation	MCQ Group Discussion Quiz
Jan 18 - 23, 2025	**C.A. Test – I**						
Jan 24 -31, 2025 (Day Order 1 to 6)	2 4	**Cell Culture Technology-II** 2.1 Type of Cell Culture 2.2 Establishing Cell Lines and Molecular Characterization **Plant Genetic Transformation Techniques** 4.2 Techniques for Plant Transformation – *Agrobacterium tumefaciens* – Mediated Gene Transfer Method	K1-K3 K3-K4 K4-k6	2 1 3	1-2 2-3 3-5	Lecture and PowerPoint presentation Lecture and PowerPoint presentation	Quiz Test (detailed answers)
Feb 3-8, 2025 (Day Order 1 to 6)	2 4	**Cell Culture Technology-II** 2.2 Establishing Cell Lines and Molecular Characterization **Plant Genetic Transformation Techniques**	K3-K4	3	2-3	Lecture and PowerPoint presentation	Group discussion

		4.2 Techniques for Plant Transformation – *Agrobacterium tumefaciens* – Mediated Gene Transfer Method 4.3 Techniques for Plant Transformation – Direct Gene Transfer Methods	K4-K6 K4-K6	1 2	3-5 3-5	Lecture and PowerPoint presentation	Quiz
Feb 10– 18, 2025 (Day Order 1 to 4)	2 4	**Cell Culture Technology-II** 2.3 Quantitation, Contamination **Plant Genetic Transformation Techniques** 4.3 Techniques for Plant Transformation – Direct Gene Transfer Methods	K3-K6 K4-K6	3 1	2-5 3-5	Lecture and PowerPoint presentation Lecture and PowerPoint presentation	Group discussion Test (detailed answers)
Feb 19- 26, 2025 (Day Order 1-6)	2 4	**Cell Culture Technology-II** 2.3 Cryopreservation 2.4 Scale-up **Plant Genetic Transformation Techniques** 4.4 Chloroplast Transformation	K4-K6 K4-K6 K4-K6	1 2 3	3-5 3-5 3-5	Lecture and PowerPoint presentation Lecture and PowerPoint presentation	Assignment (III Component) MCQ Test
Feb 27- Mar 6, 2025 (Day Order 1 to 6)	2	**Cell Culture Technology-II** 2.4 Cell Bank Preparation	K4-K6	3	3-5	Lecture and PowerPoint presentation	MCQ

	4 5	**Plant Genetic Transformation Techniques** 4.4 Chloroplast Transformation **Application of Animal and Plant Biotechnology** 5.3 GM Strategies for Insect Resistance – Environmental Impact of BT Crops, Herbicide Tolerance, Delay of Fruit Ripening, Golden Rice	K4-K6 K1-K6	1 2	3-5 1-5	Lecture and PowerPoint presentation	Debate
Mar 7 – 11, 2025 (Day Order 1 to 3)	5	**Application of Animal and Plant Biotechnology** 5.1 Production and Application of Transgenic Animal: Disease Model, Biological Model 5.3 GM Strategies for Insect Resistance – Environmental Impact of BT Crops, Herbicide Tolerance, Delay of Fruit Ripening, Golden Rice	K1-K6 K1-K6	2 1	1-5 1-5	Lecture and PowerPoint presentation Lecture and PowerPoint presentation	Seminar (III Component) Group discussion
Mar 12 –17, 2025	**C.A. Test – II**						
Mar 18 – 20, 2025 (Day 4 to 6)	5	**Application of Animal and Plant Biotechnology** 5.1 Production and Application of Transgenic Animal: Food Source	K1-K6	1	1-5	Lecture and PowerPoint presentation	Seminar (III Component)

		5.3 Transgenics for Abiotic Stress Tolerance – Drought Salinity	K1-K6	2	1-5	Lecture and PowerPoint presentation	Third component- (short answers)
Mar 21 - 28, 2025 (Day Order 1 to 6)	5	**Application of Animal and Plant Biotechnology** 5.2 Manipulation of Reproduction: *In vitro* Fertilization Embryo Transfer Technology in Farm Animals 5.4 Cytoplasmic Male Sterility, Edible Vaccines	 K3-K6 K1-K6	 3 3	 2-5 1-5	Lecture and PowerPoint presentation Lecture and PowerPoint presentation	Seminar (III Component) Case analysis
Mar 29- April 2, 2025 (Day Order 1 to 3)	**REVISION**						

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

COURSE PLAN (November 2024 – April 2025)

Department : BIOTECHNOLOGY

Name/s of the Faculty : DR. S. JAYASHREE AND DR. ARUNA SHARMILI S

Course Title : RESEARCH METHDOLOGY

Course Code : 23BY/PC/RM24

Shift : II

COURSE OUTCOMES (COs)							
COs	**Description**						**CL**
CO1	tell the concepts and research design						K1
CO2	explain the steps in research and data analysis						K2
CO3	relate advanced critical thinking and assessment						K3
CO4	outline the importance of writing and statistics in research						K4
CO5	evaluate, formulate, analyze and interpret the research ideas						K5, K6
	CL – Cognitive Level K1 – Remember | K2 – Understand | K3 – Apply | K4 – Analyse | K5 – Evaluate | K6 – Create						
Week	**Unit No.**	**Content**	**Cognitive Level**	**Teaching Hours**	**COs**	**Teaching Learning Methodology**	**Assessment Methods**
Nov 18 – 25, 2024 (Day Order 1-6)	1 3	**Principles of Research** 1.1 Research Definition-Types of Research - Descriptive, Analytical, Applied **Biostatistics** 3.1 Introduction – Definition, Statistical Terms	K1-K5 K1-K4	2 3	1-5 1-4	Lecture	Group discussion
Nov 26- Dec 3, 2024 (Day Order 1 to 6)	1	**Principles of Research** 1.1Fundamental, Quantitative, Qualitative, Conceptual and Empirical	K1-K5	1 1	1-5	Lecture	Group discussion

	3	1.2 Significance of Research - Methods vs Methodology **Biostatistics** 3.2 Application of Biostatistics	K1-K4	3	1-4		Assignment-III component
Dec 4-11, 2024 (Day Order 1 to 6)	1 3	**Principles of Research** 1.3 Research Formulation - Defining and Formulating the Research Problem **Biostatistics** 3.3 Sampling Methods	K2-K6 K1-K4	2 3	1-5 1-3	Participatory Learning Methods: Group discussion	Group discussion
Dec 12-19, 2024 (Day Order 1 to 6)	1	**Principles of Research** 1.3 Research Formulation - Defining and Formulating the Research Problem **Biostatistics** 3.4 Data Collection – Classification of Data, Representation of data	K2-K6 K2-K6	2 3	1-5 1-5	Lecture	Group discussion
Dec 20, 2024 (Day Order 1)	**NO CLASS**						

Jan 3 – 7, 2025 (Day Order 3 to 6)	1 4	**Principles of Research** 1.4 Criteria for Good Research Data **Descriptive Statistics** 4.1 Measures of Central Tendency – Mean, Median	K3-K6 K1-K6	2 2	2-5 1-5	Lecture Problem Solving	Group discussion
Jan 8 – 17, 2024 (Day Order 1 to 6)	1 4	**Principles of Research** 1.4 Essential Steps in the Research Collection **Descriptive Statistics** 4.1 Measures of Central Tendency – Mode 4.2 Measures of Dispersion - Range, Quartile Deviation	K3-K6 K1-K6 K1-K6	2 2 1	2-5 1-5 1-5	Lecture Problem Solving	Group discussion
Jan 18 - 23, 2025	**C.A. Test - I**						
Jan 24 -31, 2025 (Day Order 1 to 6)	2 4	**Research Communication and Proposal** 2.1 Essentials of the Scientific Report **Descriptive Statistics** 4.2 Measures of Dispersion – Mean Deviation, Standard Deviation, Standard Error	K1-K6 K1-K6	2 3	1-5 1-5	Lecture Problem Solving	Group discussion

Feb 3-8, 2025 (Day Order 1 to 6)	2 4	**Research Communication and Proposal** 2.1 Essentials of the Scientific Report 2.2 Preparing Manuscripts. Cross-Referencing **Descriptive Statistics** 4.3 Correlation Analysis	K1-K6 K1-K6 K2-K6	1 1 3	1-5 1-5 1-5	Problem Solving: Case study Problem Solving	Manuscript preparation-III component
Feb 10– 18, 2025 (Day Order 1 to 4)	2 4	**Research Communication and Proposal** 2.2 Proof Reading, Plagiarism **Descriptive Statistics** 4.3 Correlation Analysis	K1-K6 K2-K6	2 1	1-5 2-5	Lecture Problem Solving	Group discussion
Feb 19- 26, 2025 (Day Order 1-6)	2 4 5	**Research Communication and Proposal** 2.3 Oral and Poster Presentation Poster Presentation, Writing Thesis **Inferential Statistics** 4.4 Regression Analysis 5.1 Hypothesis Testing Null Hypothesis, Alternate Hypothesis	K1-K6 K2-K6 K1-K6	2 2 1	1-5 1-5 1-5	Lecture Problem Solving	Group discussion
Feb 27- Mar 6, 2025 (Day Order 1 to 6)	2	**Research Communication and Proposal** 2.3 Oral and Poster Presentation	K3-K6	1	3-5		Presentation

		Poster Presentation, Writing Thesis 2.4 Project Proposal Writing	 K3-K6	 1	 3-5	Participatory Learning Methods: Poster Presentation	III Component
	5	**Inferential Statistics** 5.1 Hypothesis Testing Null Hypothesis, Alternate Hypothesis 5.2 Students T- Test	 K1-K6 K1-K6	 1 2	 1-5 1-5	 Problem Solving	
Mar 7 – 11, 2025 (Day Order 1 to 3)	2 5	**Research Communication and Proposal** 2.4 Grant Application **Inferential Statistics** 5.2 Chi-Square Test	 K3-K6 K1-K6	 1 1	 2-5 1-5	 Experiential Learning Method: Project designing Problem Solving	Group discussion
Mar 12 –17, 2025	**C.A. Test - II**						
Mar 18 – 20, 2025 (Day 4 to 6)	2 5	**Research Communication and Proposal** 2.4 Funding Agencies for Project **Inferential Statistics** 5.3 ANOVA- One Way	 K3-K6 K1-K6	 2 2	 3-5 1-5	 Lecture Problem Solving	Group discussion
Mar 21 - 28, 2025	2	**Research Communication and Proposal**				Lecture	Group discussion

(Day Order 1 to 6)		2.4 Grant Application, Funding Agencies for Project **Inferential Statistics**	K3-K6	2	3-5		
	5	5.3 ANOVA- Two Way Classification	K1-K6	1	1-5	Problem Solving	
		5.4 MS-Excel for Data Analysis	K3-K6	2	2-5	Class participation	
Mar 29- April 2, 2025 (Day Order 1 to 3)	**REVISION**						

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI
COURSE PLAN
November 2024 – April 2025

Department : **BIOTECHNOLOGY**
Name/s of the Faculty : **DR. S. JAYASHREE**
Course Title : **MARINE BIOTECHNOLOGY**
Course Code : **23BY/PE/MT15**
Shift : **II**

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	describe and compare the structure of marine ecosystems	K1,K2
CO2	present the function of marine environment	K3
CO3	research the ecological significance and impacts of the marine environment	K4

CO4	evaluate the importance of marine environment and resources	K5
CO5	integrate marine-related habitats, techniques and products	K6
	CL – Cognitive Level K1 – Remember | K2 – Understand | K3 – Apply | K4 – Analyse | K5 – Evaluate | K6 – Create	

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods
Nov 18-25, 2024 (Day Order 1 to 6)	1	**Introduction to Marine Biotechnology** 1.1 Marine Environment –Marine Estuaries, Coral Reefs 1.2 Marine Flora- Classification of Plankton, Methods of Collection, Preservation	 K1-K6 K1-K6	 4 1	 1-5 1-5	**Participatory Learning Method:** Group Discussion	Quiz
Nov 26-Dec 3, 2024 (Day Order 1 to 6)	1	1.2 Marine Flora- Classification of Plankton, Methods of Collection, Preservation 1.3 Sea Weeds Classification, Distribution	K1-K6 K2-K6	3 2	1-5 1-5	Power Point, Videos and Lecture	Test (Short answers)
Dec 4-11, 2024 (Day Order 1 to 6)	1 2	1.3 Sea Weeds - Ecological Role Mangroves - Classification, Distribution, and Ecological Role **Extreme Marine Environment and Microbial Diversity** 2.1 Hydrothermal Vents	K2-K6 K1-K5	3 2	1-5 1-4	Power Point, Videos and Lecture **Experiential Learning Method:** Poster Presentation	Quiz Quiz
Dec 12-19, 2024 (Day Order 1 to 6)	2	2.1 Hydrothermal Vents 2.2 Hyperthermophilic Microorganisms and their Applications	K1-K5	2 3	1-4	Power Point, Videos and Lecture	Group Discussion

Dec 20, 2024 (Day Order 1)	**NO CLASS**						
Jan 3-7, 2025 (Day Order 3 to 6)	2	2.3 Biotechnological Applications of Extremozymes from Extremophilic Organisms	K3-K6	3	2-5	Power Point, Videos and Lecture	Assignment III component
Jan 8-17, 2025 (Day Order 1 to 6)	3	**Unit 3** **Marine Pollution** 3.1 Effects of Pollutants to Marine Organisms - Bio Concentration Bioaccumulation and Bio Magnification	K1-K4	5	1-3	**Problem Solving Method:** Case study	Quiz
Jan 18-23, 2025	**C.A. Test – I**						
Jan 24-31, 2025 (Day Order 1 to 6)	3	3.1 Effects of Pollutants to Marine Organisms - Role of (GESAMP) 3.2 Pollution – Impact of sewage, Oil, Radioactive	K1-K4 K2-K4	2 3	1-3 1-3	**Participatory Learning Methods:** Power Point Presentation	Seminar
Feb 3-8, 2025 (Day Order 1 to 6)	3	3.3 Biofouling - Marine Fouling and Boring Organisms	K3-K6	5	2-5	**Experiential Learning Method:** Model Making	Presentation III component

Feb 10-18, 2025 (Day Order 1 to 4)	4	**Unit 4** **Monitoring Marine Environment** 4.1. Light Devices, Water Sampling Devices 4.2 Salinity	K1-K4	3	1-3	Power Point and Lecture	Seminar
Feb 19-26, 2025 (Day Order 1 to 6)	4	4.2 Dissolved Oxygen 4.3 Heavy Metals and Petroleum Carbon Analysis	K1-K4 K3-K6	1 4	1-3 2-5	Power Point, Videos and Lecture	MCQ III component
Feb 27-Mar 6, 2025 (Day Order 1 to 6)	5	**Unit 5** **Marine Bioactive Products** 5.1 Pharmaceutical Products 5.2 Flavour Modifiers, Food Colouring Agents	 K1-K5 K1-K6	 2 3	 1-4 1-5	**Participatory Learning Methods:** Power Point Presentation	Seminar
Mar 7-11, 2025 (Day Order 1 to 3)	5	5.2 Food Supplements	K1-K6	2	1-5	Power Point, Videos and Lecture	Group Discussion
Mar 12-17, 2025	**CA Test – II**						
Mar 18-20, 2025 (Day Order 4 to 6)	5	5.3 Other Marine Products - Agarose	K3-K6	3	2-5	Power Point, Videos and Lecture	Quiz
Mar 21-28, 2025 (Day Order 1 to 6)	5	5.3 Other Marine Products - , Carrageen, Alginates	K3-K6	5	2-5	Power Point, Videos and Lecture	Quiz
Mar 29-April 2 2025 (Day Order 1 to 3)	**REVISION**						

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

COURSE PLAN (November 2024 – April 2025)

Department : **Biotechnology**

Name/s of the Faculty : **Dr. K. Veena Gayathri**

Course Title : **Virology**

Course Code : **23BY/PE/VR15**

Shift : **II**

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	define the terms in virology and virus-host interactions	K1-K2
CO2	relate virus replication and its diseases	K3
CO3	investigate the mechanism of disease transmission	K4
CO4	evaluate various viral diseases, growth, symptoms prevention, and control	K5
CO5	integrate concepts in virology to viral diseases	K6

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods

Nov 18 – 25, 2024 (Day Order 1-6)	1.1	Viruses – Properties and Importance	K1-K2, K6	5	1,5	Lecture: Black board Powerpoint presentations	Question and answers
Nov 26- Dec 3, 2024 (Day Order 1 to 6)	1.2	Classification of Viruses – Baltimore Classification and Taxonomy	K1-K2,	5	1	Lecture: Powerpoint presentations	Brief answers test
Dec 4-11, 2024 (Day Order 1 to 6)	1.3	Identification of Viruses - Methods and Detection techniques – Immunological and Molecular Methods	K1-K3, K6	5	1-2,5	Lecture: PowerPoint presentation **Participatory Learning Methods** Presentations-Video	**Third Component Assignment**
Dec 12-19, 2024 (Day Order 1 to 6)	2.1	Multiplication Cycle, Virus Attachment, and Entry into Cells	K1-K6	5	1-5	Lecture: power point presentation Black board	Assignment
Dec 20, 2024 (Day Order 1)	2.2	Viral Nucleic Acid-Synthesis-RNA Synthesis-DNA- Genome Replication in DNA Viruses	K1-K6	1	1-5	Lecture: power point presentation Black board	Assignment
Jan 3 – 7, 2025 (Day Order 3 to 6)	2.3	Viral replication in Host Cells	K1-K6	3	1-5	Lecture: power point presentation Black board **Experiential Learning Methods –** Group activity	Brief answers test

Jan 8 – 17, 2024 (Day Order 1 to 6)	3.1	Acutely Cytopathic Infection- Persistence, Latent, Transforming, Abortive, Null Infections	K1-K6	5	1-5	Lecture: PowerPoint presentation Black board	Brief answers test
Jan 18 - 23, 2025	**C.A. Test – I**						
Jan 24 -31, 2025 (Day Order 1 to 6)	3.2	Host Interactions- Transmission of Viruses- Horizontal, Vertical	K1-K6	5	1-5	Lecture: power point presentation Black board	Brief answers test
Feb 3-8, 2025 (Day Order 1 to 6)	3.3	Mechanism of Virus Latency- Switch On and Off Viral Genes	K1-K6	5	1-5	Lecture: power point presentation Black board	Brief answers test
Feb 10– 18, 2025 (Day Order 1 to 4)	4.1	Gastrointestinal, Respiratory and Sexually transmitted viral infections – Common Signs and Symptoms	K1-K6	3	1-5	Lecture: power point presentation Black board	Questionnaire
Feb 19- 26, 2025 (Day Order 1-6)	4.2	Carcinogenesis (Papilloma and Herpes Virus) and Tumor Viruses- Hepatitis B and Herpes Virus	K1-K6	5	1-5 1-5	Lecture: PowerPoint presentation Black board **Participatory Learning Methods** Group Discussion	**Third Component Seminar Presentation**
Feb 27- Mar 6, 2025 (Day Order 1 to 6)	4.3	Prion Diseases- Spectrum of Disease, Etiology, Pathogenesis	K1-K6	5	1-5	Lecture: PowerPoint presentation	Questionnaire

					1-5	Black board	
Mar 7 – 11, 2025 (Day Order 1 to 3)	5.1	Diagnosis Techniques for Viral Infections – Serological and Molecular Techniques	K1-K6	2	1-5	Lecture: power point presentation Black board **Problem-Solving Methods** Case study	**Third Component** Seminar Presentation
Mar 12 –17, 2025	**C.A. Test – II**						
Mar 18 – 20, 2025 (Day 4 to 6)	5.2	Cultivation of Viruses (Embryonated Eggs, Organ Cultures, Primary and Secondary Cell Cultures)	K1-K6	3	1-5	Lecture: power point presentation Black board	
Mar 21 - 28, 2025 (Day Order 1 to 6)	5.3	Introduction to Vaccines, Production and Types of Viral Vaccines	K1-K6	5	1-5	Lecture: power point presentation Black board	Assignment
Mar 29- April 2, 2025 (Day Order 1 to 3)	**REVISION**						

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

COURSE PLAN (November 2024 – April 2025)

Department **:** Biotechnology
Name/s of the Faculty **:** Dr, J. Anbumalarmathi
Course Title **:** Applications of Biotechnology
Course Code **:** 23BY/PE/AB23
Shift **:** II **Department** **:**

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	describe the basics of biotechnology	K1
CO2	apply bio-products in various fields of biotechnology	K2
CO3	assess the methods involved in research, medicine, and industries	K3
CO4	integrate biotechnological implications in agriculture, food and medicine	K4

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods
Nov 18 – 25, 2024	1	**Introduction to Biotechnology**	K1-K2	3	1-2	Lecture: power point presentation	Group discussion

(Day Order 1-6)		1.1 Fundamentals of Fermentation					
Nov 26- Dec 3, 2024 (Day Order 1 to 6)	1	1.1Fermenter-Process-Upstream and Downstream Fermentation Technology	K1-K2	3	1-2	Lecture: power point presentation	Quiz
Dec 4-11, 2024 (Day Order 1 to 6)	1	1.2 Production -Bread, Wine- Applications of Enzymes in Food Industry	K1-K4	3	1-4	Lecture: power point presentation	Test (short answers)
Dec 12-19, 2024 (Day Order 1 to 6)	1	1.3 Introduction – Antibiotics production	K1-K4	3	1-4	Lecture: power point presentation	Quiz
Dec 20, 2024 (Day Order 1)	No class						
Jan 3 – 7, 2025 (Day Order 3 to 6)	1 2	1.4Antibiotic Production Penicillin-Using microbes **Bioproducts** 2.1Bio-fertilizers	K1-K4 K1-K4	1 2	1-4 1-4	Lecture: power point presentation	**Third component** Assignment-Biofertilizer
Jan 8 – 17, 2024 (Day Order 1 to 6)	2	2.1 Composting and Vermicomposting 2.2 Mushroom – Types	K1-K4 K1-K4	2 1	1-4 1-4	Lecture: power point presentation	Group discussion

Jan 18 - 23, 2025	**C.A. Test - I**						
Jan 24 -31, 2025 (Day Order 1 to 6)	2	2.2 Mushroom Cultivation 2.2 Genetically Modified Microbes	K1-K4 K2-K4	2 1	1-4 2-4	Lecture: power point presentation	Group discussion
Feb 3-8, 2025 (Day Order 1 to 6)	2 3	2.2 Genetically Modified Microbes-Applications **Bioconversion** 3.1 Biofuels	K2-K4 K1-K4	2 1	2-4 1-4	Lecture: power point presentation	Case analysis
Feb 10– 18, 2025 (Day Order 1 to 4)	3	3.1 Biofuels	K1-K4	1	1-4 2-4	Lecture: power point presentation	Group discussion
Feb 19- 26, 2025 (Day Order 1-6)	3	3.2 Ethanol Production 3.3 Biogas production	K2-K4 K2-K4	2 1	2-4	Lecture: power point presentation	Test (short answers)
Feb 27- Mar 6, 2025 (Day Order 1 to 6)	4	**Genetic Engineering** 4.1 Introduction to Cloning 4.2 Production of Transgenic - Animals (Mouse, Sheep Cattle)	K1-K4 K2-K4	1 2	1-4 2-4	Lecture: power point presentation	Quiz
Mar 7 – 11, 2025 (Day Order 1 to 3)	4	4.3 Transgenic Plants (BT cotton, Edible Vaccines)	K2-K4	1	2-4	Lecture: power point presentation	Test (detailed answers)

Mar 12 –17, 2025	**C.A. Test - II**						
Mar 18 – 20, 2025 (Day 4 to 6)	5	**Applications** 5.1 DNA Fingerprinting in Forensic Science Diseases	K3-K4	2	3-4	Lecture: power point presentation	**Third Component** Test- Production of transgenic animals (detailed answers)
Mar 21 - 28, 2025 (Day Order 1 to 6)	5	5.2 Cancer Therapy 5.3 Marine Products from Microbes	K3-K4 K1-K4	1 2	3-4 1-4	Lecture: power point presentation	Quiz
Mar 29- April 2, 2025 (Day Order 1 to 3)	**REVISION**						

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