

“Education for Knowledge, Science and Culture”
Dr.Bapuji Salunkhe

Vivekanand College, Kolhapur (EMPOWERED AUTONOMOUS)
Department of Biotechnology
Subject -Biotechnology Optional
Academic Year 2024-25

Name of Faculty

- 1. Mrs .Salama Bashirun Mulla**
- 2. Ms. Dhanashri Ashok Wajantri**
- 3. Ms. Supriya Dinanath Potdar**
- 4. Ms. Kirti Vijaykumar Kadam**

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Biotechnology / (Optional)

Academic Year: 2024-25

Annual Teaching PlanName of the teacher: **Miss Salama Bashirun Mulla**Programme: **B.Sc. I. B.Sc. II**Semester: **I, III**Subject: **Biotechnology** Course Title: **DSE-1009A Basics of Biotechnology I**: **DSE-1009A Basics of Biotechnology II**: **DSE1009 C- Enzyme Technology**

Month July 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Paper I- Basics of Biotechnology I Scope of Biotechnology Carbohydrates	Scope and Importance of Biotechnology Branches of Biotechnology Introduction carbohydrates
14	2	16		
06	4	10	Paper III- Enzyme technology Credit I- Introduction	Introduction and concept of enzymes
Month August 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Paper II- Basics of Biotechnology II Credit -II Biophysical technique	Spectroscopy, Lambert Beers law Colorimetry
12	3	15		
06	06	10	Paper III- Enzyme technology Credit I- Active site Enzyme inhibition Enzyme kinetics	Enzyme activity, Active site Factors affecting enzyme activity Inhibition
Month September 2024			Module/Unit:	Sub-units planned
10	2	12	Paper I- Basics of Biotechnology I Lipids, Enzymes	Classification function properties
10	3	13	Paper III- Enzyme technology Credit II- Immobilization	Immobilization type and application
Month October 2024			Module/Unit:	Sub-units planned
5	2	07	Paper II- Basics of Biotechnology II Credit -II Centrifugation biochemical technique	Centrifugation Biochemical technique
5	2	07	Paper III- Enzyme technology Credit II Allosteric enzyme, Ribozym	Structure and function of allosteric enzyme Ribozyme structure function

Name and Signature of Teacher

Dr. S. B. Mulla

Name and Signature of HOD

Dr. S. B. Mulla

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Biotechnology (Optional)

Academic Year: 2024 - 25

Annual Teaching PlanName of the teacher: **Miss. Salama Harun Nadaf**Programme: **B.Sc. III** Semester: **VI**Subject: **Biotechnology****DSC-1009F1- Advances in Biotechnology****DSC- 1009F2 Cell metabolism and Virology**

Month December 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	B.Sc.I Cell Biology Unit I- Concepts in cell biology	Cell, type, cell cycle, Cell division
10	2	12		
10	2	12	B.Sc. III Credit I- Cell Metabolism Credit I- Biochemical techniques	Introduction to carbohydrate metabolism and concept in metabolism Electrophoresis type and all
Month January 2025			Module/Unit:	Sub-units planned
Lectures	Practical	Total	B.Sc.I Cell Biology Unit I- Cell organelles in cell	Cell organelles structure and function
5	2	12		
15	2	17	B.Sc. III Credit I- Lipid Metabolism Credit I- Biochemical techniques	1. Fatty acid synthesis 2. Beta oxidation 3. Tracer Techniques
Month Feb-March 2025			Module/Unit:	Sub-units planned
10	0	10	B.Sc.I Cell Biology Unit II- Genetics	Laws of Mendelian inheritance Crosslinking
17	2	19	B.Sc. III Credit I- Nucleic acid Metabolism Credit I- Biochemical techniques	Purine and pyrimidine metabolism Chromatography- Ion exchange, Gel filtration
Month -April 2025			Module/Unit:	Sub-units planned
10	2	12	B.Sc.I Cell Biology Unit II- Genetics	Epistasis, Multiple alleles, Extrachromosomal material
10	3	13	B.Sc. III Credit I- Protein Metabolism Credit I- Biochemical techniques	Urea Cycle Affinity Chromatography Spectroscopy- 1. atomic, Spectroflurometry, Infra red

Name and Signature of Teacher

Name and Signature of HOD

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Department of Biotechnology (Optional)

Academic Year: 2024 - 25

Annual Teaching Plan

Name of the teacher: **Ms. Supriya Dinanath Potdar**


Programme: **B.Sc. III, B.Sc. II, B.Sc. I** Semester: **V, III**

Subject: **Biotechnology** Course Title: **DSE-1009-E1 Plant Tissue culture**

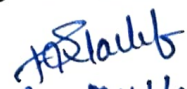
DSE-1009-C Molecular Biology

Month August 2023			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Plant Biotechnology Credit I Animal Tissue Culture	Historical and conceptual background, Lab org, Sterilization
10	02	12	Molecular Biology Credit II Basics of Biotechnology Unit I	Historical and conceptual background, Structure of DNA, RNA, protein Protein History and intro, Amino acids intro
10	02	12		
05	00	05		
Month September 2023			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Plant Biotechnology Credit I- Introduction	Culture media (Types, properties, components)
10	3	13	Molecular Biology Credit II	Prokaryotic Replication and Eukaryotic Replication
10	00	10		
05	00	05		
Month October 2023			Module/Unit:	Sub-units planned
10	02	12	Plant Biotechnology Credit II- Introduction	Callus Culture, Suspension Culture, Organ Culture
10	03	13	Molecular Biology Credit II	Pro and Eukaryotic Transcription, Prokaryotic Translation
05	00	05		
Month November 2023			Module/Unit:	Sub-units planned
10	00	10	Plant Biotechnology Credit II- Introduction	Clonal Propagation, Anther and pollen culture,
10	03	13	Molecular Biology Credit II- Basics of Mol Bio	concepts, applications Eukaryotic Translation, Gene regulation, DNA damage and repair
05	00	05		

Name and Signature of Teacher


Ms. Supriya D. Potdar

Name and Signature of HOD


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Department of Biotechnology (Optional)

Academic Year: 2024- 25

Annual Teaching Plan

Name of the teacher: **Ms. Supriya Dinanath Potdar**

Programme: **B.Sc. II, B.Sc. I** Semester: **II, VI**

Subject: **Biotechnology** Course Title: **DSC-1009D r DNA technology**

DSC- F1 Gene technology and bioinformatics

Month December 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Gene technology Credit I	Gene technology -DNA fingerprinting
10	2	12	r -DNA technology Section II Credit I	Introduction to r DNA technology, Nucleases Restriction enzymes
10	2	12		
Month January 2025			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Gene technology Credit I	Pollution and Biofuels Biodiesel Gene-targeting Gene therapy
10	2	12	r- DNA technology Section II Credit I	Enzymes to modify ends of DNA Cloning vectors Construction of C DNA and genomic library
10	2	12		
Month Feb. 2025			Module/Unit:	Sub-units planned
16	02	18	Gene technology Credit II	Bioremediation Introduction bioinformatics
06	02	08	Section II-r DNA technology Credit II	Probes Blotting techniques PCR
Month March 2025			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Bioinformatics Credit II	Database Human genome project
15	02	12	Section II -r DNA technology Credit II	DNA sequencing techniques Selection of transformed cells Applications of gene cloning Safety measures and biological risk for r-DNA work
05	02	07		

Name and Signature of Teacher

Ms. Supriya D. Potdar

Name and Signature of HOD

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Academic Year: 2024- 25

Annual Teaching Plan

Name of the teacher: **Ms Dhaanshri Ashok Wajantri**

Programme: **B.Sc. I, B.Sc. III**

Semester: **I, III, V**

Subject: **Biotechnology** Course Title: **DSE-1009-E2 Large-Scale Manufacturing Process**

DSE-1009A Basics of Biotechnology II

DSC 1009C Molecular Biology

Month August 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Concept of bioprocess engineering and fermentation technology Credit I- Introduction	The basic design of a fermentor Types of fermentors Fermentation medium and optimization
10	2	12	Basics of Biotechnology Unit II – Concept of sterilization	Introduction Physical agents: Temperature, radiation, filters
10	2	12		
Month September 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Basics of Biotechnology Unit II – Concept of sterilization	Chemical Agents: phenols and phenolic compounds, heavy metals Gaseous agents: Ethylene oxide, formaldehyde
10	3	13	Concept of bioprocess engineering and fermentation technology Credit I	Sterilization Strain Improvement Inoculum development
10	2	12		
Month October 2024			Module/Unit:	Sub-units planned
10	02	12	Credit I Basics of Biotechnology Unit II – Microscopy	Pure culture techniques Culture collection canners
10	03	13	Mutation and Its Types	General principles of microscopy SEM, TEM
07	02	09		Spontaneous, Induced mutation Expression of Mutation
Month November 2024			Module/Unit:	Sub-units planned
10	02	12	Credit I - Bioremediation	Bioremediation of Heavy metals, Hydrocarbons, dyes, Pesticides
05	02	07	Unit II -Sterilization	Concept and type of sterilization

Name and Signature of Teacher

Ms. Wajantri Dhaanshri A.

Name and Signature of HOD

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Department of Biotechnology (Optional)

Academic Year: 2024- 25

Annual Teaching Plan

Name of the teacher: **Ms Dhaanshri Ashok Wajantri**

Programme: **B.Sc. I. B.Sc. III**

Semester: **I ,III, V**

Subject: **Biotechnology** Course Title: **DSE-1009-E2 Large-Scale Manufacturing Process**

DSE-1009A Basics of Biotechnology II

DSC 1009C Molecular Biology

Month August 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Concept of bioprocess engineering and fermentation technology Credit I- Introduction	The basic design of a fermentor Types of fermentors Fermentation medium and optimization
10	2	12	Basics of Biotechnology Unit II – Concept of sterilization	Introduction Physical agents: Temperature, radiation, filters
10	2	12		
Month September 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Basics of Biotechnology Unit II – Concept of sterilization	Chemical Agents: phenols and phenolic compounds, heavy metals Gaseous agents: Ethylene oxide, formaldehyde
10	3	13	Concept of bioprocess engineering and fermentation technology Credit I	Sterilization Strain Improvement Inoculum development
10	2	12		
Month October 2024			Module/Unit:	Sub-units planned
10	02	12	Credit I Basics of Biotechnology Unit II – Microscopy	Pure culture techniques Culture collection centers
10	03	13		General principles of microscopy SEM, TEM
07	02	09	Mutation and Its Types	Spontaneous, Induced mutation Expression of Mutation
Month November 2024			Module/Unit:	Sub-units planned
10	02	12	Credit I - Bioremediation	Bioremediation of Heavy metals ,Hydrocarbons ,dyes,Pesticides
05	02	07	Unit II -Sterilization	Concept and type of sterilization

Name and Signature of Teacher

Ms. Wajantri Dhaanshri A.

Name and Signature of HOD

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Academic Year: 2024- 25

Annual Teaching Plan

Name of the teacher: **Ms. Dhanashri Ashok Wajantri**

Programme: **B.Sc. II, B.Sc. I** Semester: **II, VI**

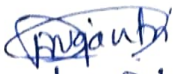
Subject: **Biotechnology**

Course Title: **DSE-1009B Microbiology**


DSC – Environmental Biotechnology

Month January 2025			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Microbiology Unit I- History of Microbiology	Contributions Types of Microorganisms
10	2	12	Unit I- Conventional and Non-conventional	Types of fuel
Month February 2025			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Microbiology Unit I- Morphology & cytology of bacteria	Size, shape, arrangement Structure and function of cell organelles like cell wall, cell membrane, capsule, Pilli, flagella, nuclear material, etc.
10	2	12	Unit I- Types of sewage treatment	1. Primary 2. Secondary 3. Tertiary
Month March-April 2025			Module/Unit:	Sub-units planned
10	0	10	Microbiology Unit II- Culture media and pure culture techniques	Common components Peptone, yeast extract, NaCl, agar agar, etc.
10	2	12	Unit II –Culture media types	Living, non-living, methods of isolation of pure cultures, stain and staining procedures
			Unit –II Bioremediation and Biofertilizers	Bioremediation and Biofertilizers types

Name and Signature of Teacher


Ms. Wajantri Dhanashri A.

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Department of Biotechnology (Optional)
Academic Year: 2024-25

Annual Teaching Plan

Name of the teacher: **Ms. Kirti Vijaykumar Kadam**

Programme: **B.Sc. II, B.Sc. I** Semester: **I,V,**

Subject: **Biotechnology**

Course Title: **DSE-1009B Microbiology**

DSC-1009D Animal tissue culture and

Large scale manufacturing process and specific fermentation

Month August 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Animal Tissue Culture Credit -I Large scale manufacturing processes and special fermentation -I Credit -I	History background and requirements of animal cell culture Culture media natural ,synthetic and other Production of primary metabolites and production of fermented foods and microbial biomass production
10	2	12		
Month – September 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Animal Tissue Culture Credit -II Large scale manufacturing processes and special fermentation -II Credit –II Fundamentals of biotechnology -II Unit -2	Characteristics cultured cells ,Basic technique of mammalian cell culture Production of recombinant products and fermentation economics Centrifugation – basic principles Svedberg constant
10	2	12		
Month March-April 2024			Module/Unit:	Sub-units planned
10	0	10	Microbiology Unit II- Culture media and pure culture techniques Unit II –Culture media types	Common components Peptone, yeast extract, NaCl, agar agar, etc.
10	2	12		Living, non-living, methods of isolation of pure cultures, stain and staining procedures Principle ,mechanism and applications Defination and types

Name and Signature of Teacher

K.Kadam
Miss. Kadam Kirti.V.

Name and Signature of HOD

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Department of Biotechnology (Optional)

Academic Year: 2024- 25

Annual Teaching Plan

Name of the teacher: **Ms. Kirti Vijaykumar Kadam**

Programme: **B.Sc. II, B.Sc. I** Semester: **II, IV**

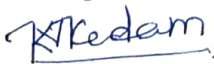
Subject: **Biotechnology**

Course Title: **DSE-100thB Cell Biology**


DSC-1009D - Immunotechnology

Month December 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	B.Sc.I Cell Biology Unit I- Concepts in cell biology	Cell, type , cell cycle, Cell division
10	2	12		
10	2	12	B.Sc. II Credit I- Immunity organ Credit I- Organs of immune system	Introduction to Immunology
Month January 2025			Module/Unit:	Sub-units planned
Lectures	Practical	Total	B.Sc.I Cell Biology Unit I- Cell organelles in cell	Cell organelles structure and function
5	2	12		
15	2	17	B.Sc. II Credit I- Antigen Credit I- Antibody	1. Types of antigen 2. Types of antibodies
Month Feb-March 2025			Module/Unit:	Sub-units planned
10	0	10	B.Sc.I Cell Biology Unit II- Genetics	Lows of Mendelian inheritance Crosslinking
17	2	19	B.Sc. III Credit I- Serological technique Credit I- Biochemical techniques	ELISA Agglutinin Precipitation
Month -April 2025			Module/Unit:	Sub-units planned
10	2	12	B.Sc.I Cell Biology Unit II- Genetics	Epistasis, Multiple alleles, Extrachromosomal material
10	3	13	B.Sc. III Credit I- Enteric fever types Credit I- Urinary tract infection	typhoid

Name and Signature of Teacher


Miss. Kadam Kirti.V.

Name and Signature of HOD


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