

## Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc I Sem I Department: Microbiology

Subject: Microbiology

Course Title: DSC 1010 A : BASIC TECHNIQUES IN MICROBIOLOGY

Name of the teacher: Ms.V.V.Misal

Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit I	<b>A. General Principles of Microscopy :</b> 1. Types of microscopes: a) light microscopes b) electron microscopes, 2.Light microscopy:
5	3	8		
Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit I	2. Ray diagram, special features and applications of : a) Compound Microscope b) Phase Contrast Microscope c) Electron Microscope d) Fluorescence Microscope
5	3	8		
Month: December			Module/Unit:	Sub-units planned
5	3	8	Section I Unit I	<b>B. Stains and Staining procedures</b> 1. Definition of dye and stain 2. Classification of stains – Acidic, Basic and Neutral
Month: January			Module/Unit:	Sub-units planned
5	3	8	Section I Unit I	3. Principles, Procedure, Mechanism of staining procedures a) Monochrome staining b) Negative staining c) Differential staining : i) Gram's staining ii) Acid fast staining
Month: February			Module/Unit:	Sub-units planned
5	3	8	Section I Unit I	. Special staining methods a) Cell wall (Chance's method) b) Capsule (Manvel's method) c) Volutin granule (Albert's method)

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## Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc I Sem II

Department: Microbiology

Subject: Microbiology

Course Title: Bacteriology and applied microbiology

Name of the teacher: Ms.V.V.Misal

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit I	A. Proteins : i) Introduction to amino acids , peptide bond. ii) Types of amino acids based on R group
5	2	7		
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit I	B. Carbohydrates: i) Monosaccharides : ii) Disaccharides : ii) Polysaccharide s : Structure of starch, glycogen and cellulose.
5	2	7		
Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit I	C. Lipids : i) Simple lipids – Fats, oils and waxes ii). Compound lipids – Phospholipid, Glycolipids iii) Derived lipids – Cholesterol
5	2	7		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit I	D. Enzymes: E. Nucleic Acids
5	2	7		

*V.V.Misal*

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## Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc II Sem III

Department: Microbiology

Subject: Microbiology

Course Title: Microbial Physiology, Metabolism and Applied Microbiology

Name of the teacher: Ms.V.V.Misal

Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	<b>Industrial Microbiology</b> <b>A . Basic concepts of fermentation.</b> 1. Definition, concept of primary and secondary metabolites.
6	8	14	Unit II	
Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	2. Types of fermentations – Batch, continuous, dual and multiple fermentation.
6	8	14	Unit II	
Month: December			Module/Unit:	Sub-units planned
6	8	14	Section I	3. Typical Fermentor design – Parts and their functions. 4. Factors affecting fermentation process.
			Unit II	
Month: January			Module/Unit:	Sub-units planned
6	8	14	Section I	<b>C. Fermentation media -</b> a. Water, carbon source, nitrogen source, precursors, growth
			Unit II	
Month: February			Module/Unit:	Sub-units planned
6	8	14	Section I	factors, antifoam agents, chelating agents
			Unit II	

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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc II Sem IV

Department: Microbiology

Subject: Microbiology

Course Title: Microbial Genetics, Molecular Biology, Basics in Medical Microbiology & Immunology

Name of the teacher: Ms.V.V.Misal

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	<b>Molecular Biology</b> 1. Gene transfer in bacteria. 2. Fate of exogenote in recipient cell.
6	2	8	Unit II	
Month: May			Module/Unit:	
Lectures	Practicals	Total	Section II	3. Modes of gene transfer – a. Transformation. b. Conjugation c. Transduction
6	2	8	Unit II	
Month: June			Module/Unit:	Sub-units planned
6	2	8	Section II	1. Plasmids – a. Natural – Properties, types , structure & applications b. Artificial – pBR 322- structure and applications
			Unit II	
Month: July			Module/Unit:	
6	2	8	Section II	2. DNA repair : i) Photoreactivation ii) Dark repair mechanism ( Excision repair)
			Unit II	

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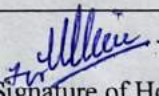
Academic Year: 2021-22 Semester: V ( B.Sc.III) Department: Microbiology

Subject: Microbiology Course Title: dse:1010e1 immunology and medical microbiology

Name of the teacher – Ms.V.V.Misal

Month: September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	1.Cells of Immune system – 2. Membrane receptors for antigen and their role in antigen recognition
12	8	20	Unit I	
Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	3. Molecular mechanism of antibody production.
12	8	20	Unit II	
Month: November			Module/Unit:	Sub-units planned
12	8	20	Section I	1.1 Cytokines 2 Immunological tolerance :
			Unit III	
Month: December			Module/Unit:	Sub-units planned
12	8	20	Section II	3 Interferon 1. Complement 2.Monoclonal antibodies
			Unit IV	
Month: January			Module/Unit:	Sub-units planned
12	8	20	Section II	1.New diagnostic techniques 2.Hypersensitivity
			Unit IV	
Month: February			Module/Unit:	Sub-units planned
12	8	20	Section II	3.Autoimmunedisease
			Unit IV	

  
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### Annual Teaching Plan


Academic Year: 2020-2021 Semester: B.Sc III Sem VI Department: Microbiology

Subject: Microbiology Course Title: Virology and Microbial Genetics

Name of the teacher: Ms.V.V.Misal

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit I	1. One cistron - one polypeptide hypothesis. 2. Molecular mechanism of gene expression
12	4	16		
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit II	1. Mutations 2. Methods of isolation and detection of mutants based on a. Relative survival b. Relative growth c. Visual detection
12	4	16		
Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit III	Techniques in Molecular Biology -
12	4	16		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit I	Genetic engineering
12	4	16		

  
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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc I Sem I


Department: Microbiology

Subject: Microbiology


Course Title: Introduction to microbiology and microbial diversity

Name of the teacher: Mr. Suraj D. Gabale

Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	1. History and milestones in Microbiology a. Spontaneous generation vs biogenesis
5	2	7	Unit I	
Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	b. Contributions of scientists 2. History and milestones in Microbiology a. Beneficial and harmful activities of Microorganisms
5	2	7	Unit I	
Month: December			Module/Unit:	Sub-units planned
5	2	7	Section I	b. Classification of organisms i) Whittaker's classification ii) Carl Woese's classification
			Unit I	
Month: January			Module/Unit:	Sub-units planned
5	2	7	Section I	2. Scope of Microbiology a. Introduction to applied branches of Microbiology
			Unit I	
Month: February			Module/Unit:	Sub-units planned
5	2	7	Section I	3. Bacterial systematic a. Taxonomic ranks b. Bacterial nomenclature
			Unit I	

Mr. S. D. Gabale   
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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc II Sem IV


Department: Microbiology

Subject: Microbiology

Course Title: Microbial Genetics, Molecular Biology, Basics in Medical Microbiology & Immunology

Name of the teacher: Mr. Suraj D. Gabale

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	IMMUNOLOGY
6	2	8	Unit II	1. Immunity 2. Non-specific defense mechanism
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	3. Antigens
6	2	8	Unit II	a. Chemical nature b. Types c. factors affecting antigenicity 4. Antibodies
Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	5. Theories of antibody production
6	2	8	Unit II	6. Immune response
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	7. Mechanism of Ag-Ab reaction
6	2	8	Unit II	8. Types of Ag-Ab reactions 9. Types of immune response 10. Organs of Immune system

Mr. S.D. Gabale 

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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc I Sem II


Department: Microbiology

Subject: Microbiology

Course Title: Bacteriology and applied microbiology

Name of the teacher: Mr. Suraj D. Gabale

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	I. Bacterial cell organization. a. Cell size shape and arrangement b. Cell wall
5	2	7	Unit I	
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	c. Cell membrane d. Capsule and slime layer e. Flagella
5	2	7	Unit I	
Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	f. Pili g. Endospores h. Nucleoid i. Mesosomes j. Ribosome
5	2	7	Unit I	
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	1. Reserve food material a. Nitrogenous b. Non-nitrogenous
5	2	7	Unit I	

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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc III Sem VI


Department: Microbiology

Subject: Microbiology

Course Title: Virology and Microbial Genetics

Name of the teacher: Mr. Suraj D. Gabale

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit I	1. General characteristics of Viruses 2. One step growth experiment 3. Viroids 4. Prions 5. Capsid, envelope and nucleic acid of viruses
12	4	16		
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit II	1. Isolation and cultivation of- a. Bacteriophages b. Animal viruses c. Plant viruses 2. Enumeration of viruses 3. Purification of viruses
12	4	16		
Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit III	Multiplication cycles of- a. Adenoviruses b. TMV c. Lambda phage d. T4 bacteriophages
12	4	16		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit IV	1. Types of cancer cells 2. Types of cancer 3. Oncogenic viruses 4. Hypothesis about cancer
12	4	16		

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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc III Sem V


Department: Microbiology

Subject: Microbiology

Course Title: Immunology and Clinical Microbiology

Name of the teacher: Mr. Suraj D. Gabale

Month: September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	1. <i>Mycobacterium leprae</i> 2. <i>Clostridium perfringenes</i>
12	4	16	Unit I	
Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	1. <i>Treponema pallidum</i> 2. <i>Pseudomonas aeruginosa</i> 3. <i>Vibrio cholerae</i>
12	4	16	Unit II	
Month: November			Module/Unit:	Sub-units planned
12	4	16	Section II	1. <i>Helicobacter pylori</i> 2. <i>Leptospira interrogans</i> 3. <i>Plasmodium falciparum</i> 4. <i>Candida albicans</i> 5. Dengue virus
			Unit III	
Month: December			Module/Unit:	Sub-units planned
12	4	16	Section II	1. Hepatitis A and B virus 2. Rabies virus 3. SARS virus
			Unit IV	
Month: January			Module/Unit:	Sub-units planned
12	4	16	Section II	1. Chemotherapy 2. Gene therapy 3. Antimicrobial chemoprophylaxis
			Unit IV	
Month: February			Module/Unit:	Sub-units planned
12	4	16	Section II	1. Drug resistance 2. Vaccines
			Unit IV	

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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc I Sem I

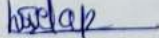
Department: Microbiology

Subject: Microbiology

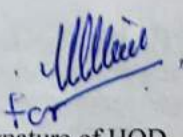
Course Title: Introduction to microbiology and microbial diversity

Name of the teacher: Ms. S.A.Pise

Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	1. Types of Microorganisms: A .General characteristics of different group- Acellular , Cellular microorganism
5	2	7	Unit I	
Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	1. Structure of Prokaryotic & eukaryotic cell. 2. Difference between prokaryotic and eukaryotic microorganisms.
5	2	7	Unit I	
Month: December			Module/Unit:	Sub-units planned
5	2	7	Section I	2. Control of Microorganisms – A. Definitions
			Unit I	
Month: January			Module/Unit:	Sub-units planned
5	2	7	Section I	B. Mode of Action and application of –a) Physical agents
			Unit I	
Month: February			Module/Unit:	Sub-units planned
5	2	7	Section I	b) Chemical Agents
			Unit I	

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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc I Sem II


Department: Microbiology

Subject: Microbiology

Course Title: Bacteriology and applied microbiology

Name of the teacher: Ms. S. A. Pise

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit IV	1. Enrichment and Isolation of Microorganisms from natural environment
5	2	7		
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit IV	2. Preservation of microbial cultures –
5	2	7		
Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit IV	3. Systematic study of pure cultures:
5	2	7		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit IV	4. Concept Culture collection centres.
5	2	7		

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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc II Sem III

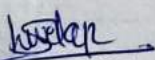
Department: Microbiology

Subject: Microbiology


Course Title: Microbial Physiology, Metabolism and Applied Microbiology

Name of the teacher: Ms. S. A.Pise

Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	A] Air Microbiology:
6	2	8	Unit III	
Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	B ] Food Microbiology
6	2	8	Unit III	
Month: December			Module/Unit:	Sub-units planned
6	2	8	Section II	1.General Principles & methods of food preservation.
			Unit III	
Month: January			Module/Unit:	Sub-units planned
6	2	8	Section II	1 . Biostatics
			Unit III	
Month: February			Module/Unit:	Sub-units planned
6	2	8		1. Bioinformatics .

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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc II Sem IV

Department: Microbiology

Subject: Microbiology

Course Title: Microbial Genetics, Molecular Biology, Basics in Medical Microbiology & Immunology

Name of the teacher: Ms. S. A.Pise

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit III	1. Definations 2. Virulence factor
6	2	8		
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit III	1. Types of diseases 2. Types of infections
6	2	8		
Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit III	1. Modes of transmission of diseases 2. General principles of prevention and control of microbial diseases
6	2	8		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit III	1. Normal flora of human body & its significance (flora of skin, throat, GI tract & Urinogenital tract)
6	2	8		

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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc III Sem V

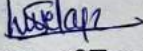
Department: Microbiology

Subject: Microbiology


Course Title: Industrial microbiology and microbial biochemistry

Name of the teacher: Ms. S. A. Pise

Month: September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	1 .Enzymes
12	4	16	Unit I	
Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	1. Extraction & purification of enzymes. 2. Assay of enzymes - 3. Immobilization of enzymes 4. Confirmation of purified enzymes
12	4	16	Unit I	
Month: November			Module/Unit:	Sub-units planned
12	4	16	Section II	1. Basic concepts of Glyoxylate bypass, Phosphoketolase pathway, Bioluminescence -
			Unit II	
Month: December			Module/Unit:	Sub-units planned
12	4	16	Section II	1. Assimilation of Carbon, Nitrogen, Sulphur
			Unit II	
Month: January			Module/Unit:	Sub-units planned
12	4	16	Section II	1. . Prokaryotic Biosynthesis of RNA, DNA
			Unit II	
Month: February			Module/Unit:	Sub-units planned
12	4	16	Section II	1. . Prokaryotic Biosynthesis of Proteins, Peptidoglycan
			Unit II	

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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc III Sem VI

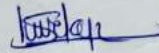
Department: Microbiology

Subject: Microbiology


Course Title: Agricultural and Environmental microbiology

Name of the teacher: Ms. S.A.Pise

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit I	1. Soil Microbiology. 2. Role of microorganisms in elemental cycle
12	4	16		
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I Unit I	1. . Manure and Compost
12	4	16		
Month: June			Module/Unit:	Sub-units planned
12	4	16	Section I Unit II	1. Types, production, methods of application and uses.
Month: July			Module/Unit:	Sub-units planned
12	4	16	Section I Unit II	1. Biodegradation by bacteria & fungi 2. Plant Pathology

S.A.Pise,   
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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc I Sem I

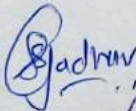
Department: Microbiology

Subject: Microbiology

Course Title: Introduction to microbiology and microbial diversity

Name of the teacher: Ms. S. V. Jadhav

Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit IV	1. Microbial Nutrition A) Nutritional requirements of microorganisms:
5	2	7		
Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit IV	B) Nutritional types of microorganism based on carbon and energy sources
5	2	7		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit IV	2. Culture media:
5	2	7		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit IV	Functional types of culture media
5	2	7		
Month: February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II Unit IV	3. Cultivation of microorganisms
5	2	7		

Ms. S. V. Jadhav 

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## Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc I Sem II

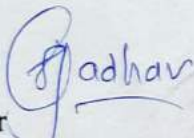
Department: Microbiology


Subject: Microbiology

Course Title: Bacteriology and applied microbiology

Name of the teacher: Ms. S. V. Jadhav

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	1 Water microbiology a) Sources of microorganisms in water. b) Fecal pollution of water.
5	2	7	Unit III	
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	c) Indicators of fecal pollution d) Routine Bacteriological analysis of water
5	2	7	Unit III	
Month: June			Module/Unit:	Sub-units planned
5	2	7	Section II	2) Milk Microbiology a) General composition of Milk. b) Sources of contamination in milk
			Unit III	
Month: July			Module/Unit:	Sub-units planned
5	2	7	Section II	c) Microbiological examination of Milk d. Spoilage of milk
			Unit III	

Ms. S. V. Jadhav   
Name and Signature of Teacher

  
Name and Signature of HOD  
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DEPARTMENT OF MICROBIOLOGY  
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(AUTONOMOUS)

### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc II Sem III

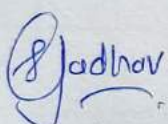
Department: Microbiology

Subject: Microbiology


Course Title: Microbial Physiology, Metabolism and Applied Microbiology

Name of the teacher: Ms. S. V. Jadhav

Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	A] Growth : Growth phases,
6	2	8	Unit I	
Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	measurement of growth,
6	2	8	Unit I	
Month: December			Module/Unit:	Sub-units planned
6	2	8	Section I	continuous growth, synchronous growth and diauxic growth
			Unit I	
Month: January			Module/Unit:	Sub-units planned
6	2	8	Section I	B] Effect of environmental factors on microbial growth
			Unit I	
Month: February			Module/Unit:	Sub-units planned
6	2	8	Section I	c. Transport across the cell membrane
			Unit I	

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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc II Sem IV

Department: Microbiology

Subject: Microbiology

Course Title: Microbial Genetics, Molecular Biology, Basics in Medical Microbiology & Immunology

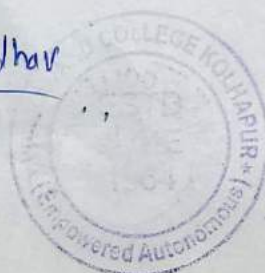
Name of the teacher: Ms. S. V. Jadhav

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	1. Forms of DNA. 2. Basic concepts – Gene, genome, genotype, phenotype, mutagen, recon, muton, cistron, split genes.
6	2	8	Unit I	
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	3. Genetic code 4. Organization of chromosomal DNA in <i>E.Coli</i>
6	2	8	Unit I	
Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	B] Mutation: - 1. Basic Concepts of Mutation 2. Spontaneous mutation
6	2	8	Unit I	
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	3. Induced mutations
6	2	8	Unit I	

Ms. S.V. Jadhav

Name and Signature of Teacher

*S.V. Jadhav*



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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc III Sem V

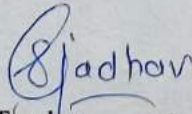
Department: Microbiology

Subject: Microbiology

Course Title: Industrial microbiology and microbial biochemistry

Name of the teacher: Ms. S. V. Jadhav

Month: September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	1. Food Microbiology
12	4	16	Unit I	
Month: October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section I	2. Industrial Microbiology
12	4	16	Unit I	
Month: November			Module/Unit:	Sub-units planned
12	4	16	Section I	1. Industrial production of
			Unit II	
				a. Amylase
				b. Grape wine
				c. Penicillin
				d. Citric acid
				e. SCP
Month: December			Module/Unit:	Sub-units planned
12	4	16	Section I	2. Microbial production of
			Unit II	
				a. Vitamin B12
				b. Amino acid- Lysine
Month: January			Module/Unit:	Sub-units planned
12	4	16	Section I	3. Probiotics
			Unit II	
				4. Downstream processing and product recovery
Month: February			Module/Unit:	Sub-units planned
12	4	16	Section I	5. Testing of sterility, pyrogen, carcinogenicity, toxicity and allergens
			Unit II	

Ms. S. V. Jadhav   
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### Annual Teaching Plan

Academic Year: 2020-2021

Semester: B.Sc III Sem VI

Department: Microbiology

Subject: Microbiology

Course Title: Agricultural and Environmental microbiology

Name of the teacher: Ms. S. V. Jadhav

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	1.General characteristics of waste
12	4	16	Unit I	
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	2.Sewage Microbiology 3.Characteristics and treatment of waste
12	4	16	Unit I	
Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	4.Eutrophication 1. Biological safety in laboratory
12	4	16	Unit II	
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Section II	2. Environmental monitoring 3. Environmental Impact Assessment
12	4	16	Unit II	

Ms. S.V. Jadhav  
Name and Signature of Teacher



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