Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Structured Work Plan for Teaching

(Winter 2021-2022)

1. Details of Classes to be taught

Sr. No.	Class	Name of Asist. Prof.	Subject	Paper
1.	B. VOC FPT I	Miss. Ashwini M. Devarshe	Food Processing and Technology	**Course Title:** Introduction to Food Processing **Course Code:** U-IFP-209 **Course Title:** Lab Course I **Course Code:** U-LAC-210
				Course Title: Introductory General Microbiology **Course Code :** U-IGM-211 **Course Title :** Lab course II **Course Code :** U-LAC-212
2.	M. Sc. BT I		Biotechnology	**Course Title:** Microbial Physiology **Course Code:** P-MIP-136 **Course Title:** Lab Course III **Course Code:** P-LAC-140

1) Summary of Lesson Plan

Name of Teacher: Miss. Ashwini M. Devarshe **Class: B. VOC FPT(**First Semester)

Course Title :- Introduction to Food Processing. **Course Code:-** U-IFP-209

Sr. No.	Subject	Unit and Chapter to be covered	No. of Lectures	Date	Academic activities to be organizer	No. of Test / Assignment

1	Introduction to Food Processing	**UNIT I** • Specifications Introduction to food processing: Definition; Objectives • Scope of food processing industries • Sectors of food processing industry • Importance and future prospects food Processing • Classification of food – perishable and semi perishable food	03 03 03 03 03	11/ 11/2021 To 24/11/2021	Group Discussion Surprise test Quiz competition	1)Class test on unit I: 2)Class test on Unit II: 3)Quiz competition.
		Unit II • Primary processing: Cleaning, Sorting, Grading, Cutting, • Seeding, Bleaching, Chilling And freezing • Secondary processing: Slicing, Pulping, Paste, Frying, Chilling and Freezing, Milling • Common food processing: Cooking, Baking, Frying, Roasting	03 03 03 03	25/11/2021 To 23/12/2021		

		• Toasting, Grilling, Blanching, Extrusion, Pickling, Refining	03			
		Unit III: • Methods in Food Processing • Microwave processing, Extrusion cooking • Ohmic Heating, Reverse osmosis • Electro dialysis, Ultrafiltration • High pressure processing, Super critical fluid extraction.	03 03 03 03 03	24/12/2021 To 04/01/2022		

		Unit IV: • Brief introduction to plant food processing: • Classification, Fruit and vegetable processing, • Cereal and legume processing, Oil seeds processing. • Brief introduction to animal food processing: Classification, Milk processing, • Meat processing, Fish processing, Poultry processing	03 03 03 03 03	05/01/2022 To 15/01/2022		

Course Title :- Lab Course I **Course Code :-** U-LAC-210

Sr. No.	Subject	Practical's	Date	No. of Practical's
1	Introduction to Food Processing	Milling of Wheat flour.	10/11/2021 To 15/01/2022	01
2		Identification and description of common pulses		01
3		Preparation of fried snacks		01
4		Preparation of germinated foods.		01
5		Preparation of chapati, and baked goods (bread, biscuits and cakes)		01
6		To blanch a seasonal fruit or vegetable		01
7		Assess the quality of blanching process		01
8		Extraction of juice by different methods		01
9		Preparation of tomato juices, puree, sauces, ketchups, soup, paste		01
10		Preparation of tomato juices, puree, sauces, ketchups, soup, paste		01
11		Preparation of sauerkraut, gherkins, cauliflower, lime, mango and mixed pickles		01
12		Use of microwave for food processing		01
13		Visit to food industry		01

Name of Teacher: Miss. Ashwini M. Devarshe

Signature:

Name of Teacher: Miss. Ashwini M. Devarshe **Class: B. VOC. FPT (First Semester)**

Course Title :- Introductory General Microbiology. **Course Code :-** U-LAC-211

Sr. No.	Subject	Unit and Chapter to be covered	No. of Lectures	Date	Academic activities to be organizer	No. of Test / Assignment
1	Introductory General Microbiology	**Unit 1** • Evolution and scope of microbiology • Microbial classification, nomenclature and Identification • Taxonomic groups and general methods of classifying bacteria • Microscopy and microscopes • Smears and staining		11/ 11/2021 To 24/11/2021	Group Discussion Surprise test Quiz comp-etition	1)Class test on unit I: 2)Class test on Unit II: 3)Quiz competition.
		Unit II • Morphology and fine structure of bacteria, • cultivation of bacteria • nutritional requirements • nutritional classification of bacteria, phototrophs, Chemotroph • autotrophs and heterotrophs, obligate parasites		25/11/2021 To 23/12/2021		
		Unit III:				

		• Bacteriological media • growth of bacteria • reproduction of bacteria, • introduction to Fungi, algae and protozoa and virus • Nutrient transport phenomenon: passive diffusion, Facilitated diffusion, group translocation and active transport		24/12/2021 To 04/01/2022		
		Unit IV: • Destruction of microorganisms: physical agents and chemical agents • chemotherapeutic agents and chemotherapy • characteristics of antibiotics and mode of action of antibiotics • Pure culture: methods of isolation of pure cultures • maintenance and preservation of pure cultures and culture collections.		05/01/2022 To 15/01/2022		

Course Title: Lab Course II **Course Code:** U-LAC-212

Sr. No.	Subject	Practical's	Date	No. of Practical's
1	Introductory General Microbiology	Guidelines for safety in food microbiology laboratory work	10/11/2021 To 15/01/2022	01
2		Introduction to equipment's commonly used in microbiology laboratory		01
3		Sterilization of glassware's used in microbiology laboratory		01
4		Simple staining: monochrome straining and negative staining		01
5		Differential staining: Gram's staining and spore staining		01
6		Microscopy		01
7		Preparation of culture media		01
8		Dye reduction tests for microorganisms		01
9		Isolation of microorganisms using streak plate method		01
10		Isolation and enumeration of microorganisms using spread plate method		01
11.		Isolation and enumeration of microorganisms using pour plate method		01

12.		Effect of different factors on growth of microorganisms		01
13.		Microorganisms examination of water		

Name of Teacher: Miss. Ashwini M. Devarshe

Signature:

Name of Teacher: Miss. Ashwini M. Devarshe **Class:** B. VOC. FPT (First Semester)

Course Title: Microbial Physiology **Course Code:** P-MIP-136

Sr. No.	Subject	Unit and Chapter to be covered	No. of Lectures	Date	Academic activities to be organizer	No. of Test / Assignment
1	Microbial Physiology	**UNIT I** • The Beginning of Microbiology: Discovery of the microbial world by Antony van Leeuwenhoek; • Controversy over Spontaneous generation • Role of microorganisms in transformation of organic matter And in the causation of diseases • Development of pure culture methods; Enrichment culture Methods • developments of microbiology in the twentieth century. • Knowing microbial world: Bacteria: Purple and green bacteria, Cyan bacteria, Homoacetogenic bacteria.	01 01 01 01 01 02	11/ 11/2021 To 24/11/2021	Group Discussion Surprise test Quiz comp-etition	1)Class test on unit I: 2)Class test on Unit II: 3)Quiz competition.

		Acetic acid Bacteria, Budding and appendaged bacteria, • Spirilla, Spirochetes, Sheathed bacteria, Pseudomonads; Lactic and propionic acid bacteria, Endospore forming rods and cocci • Mycobacterium, Rickettsia's, Chlamydia's and Mycoplasma. • Archaea: Halophiles, Methanogens, Thermoplasma, Ferroplasma and Hyperthermophilic • Eukarya: Algae, Fungi, Slime moulds and Protozoa. • Viruses: Bacterial Plant. Animal and Tumor viruses; Viroids and Prions.	02 01 02 01 02			
		UNIT II • Pure culture techniques Theory and practice of sterilization, Enrichment culture techniques. • New approaches to bacterial taxonomy classification including Ribotyping; • Ribosomal RNA Sequencing • Taxonomy, Nomenclature and Bergey's Manual.	02 02 02 02	25/11/2021 To 23/12/2021		
		Unit III: • Microbial Growth :The definition of growth,	01			

		• mathematical expression of growth, growth curve, • measurement Of Growth and growth yields; • Synchronous growth: Continuous culture • Growth as Affected by Environmental factors like temperature, acidity, alkalinity, water availability And oxygen; • Culture collection and maintenance of cultures.	01 01 01 02 01	24/12/2021 To 04/01/2022		
		Unit IV: • Overview of Basic Metabolism & Microbial Nutrition: • Metabolic Diversity among Micro-organisms; Photosynthesis in microorganisms • Role of Chlorophylls, carotenoids and Phycobilins; • Calvin cycle • Chemolithotrophy • Hydrogen iron - nitrite - oxidizing bacteria; Nitrate and sulfate reduction; • Methanogenesis and acetogenesis	01 03 02 01 02 02 02 02	05/01/2022 To 15/01/2022		
		• Fermentations - diversity, syntrophy				

Course Title: Lab Course III **Course Code:** P-LAC-140

Sr. No.	Subject	Practical's	Date	No. of Practical's
1	Microbial Physiology	Preparation of liquid and solid media for growth of microorganisms.	10/11/2021	01
2	(Lab Course III)	Isolation and maintenance of organisms by plating, streaking and serial dilution Methods. Slants and stab cultures. Storage of microorganisms.	To 15/01/2022	01
3		Isolation of pure cultures from soil and water.		01
4		Growth: Growth curve.		01
5		Measurement of bacterial population by turbidometry and serial dilution methods.		01
6		Effect of temperature, pH and carbon and nitrogen sources on growth.		01
7		Microscopic examination of bacteria, yeast and molds and study of organisms by Monochrome stain, Negative Stain, Gram stain and staining for spores.		01
8		Assay of antibiotics.		01
9		Analysis of water for portability and determination of MPN.		01
10		Biochemical characterization of selected microbes.		01

Course Teacher

HoD

Head
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Principal

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Structured Work Plan for Teaching

(Summer 2021-2022)

1. Details of Classes to be taught

Sr. No.	Class	Name of Asist. Prof.	Subject	Paper
1	B. Sc BT II	Miss. Ashwini M. Devarshe	Biotechnology	**Course Title:** Process Biotechnology **Course Code:** U-PRB-499 **Course Title:** Lab Course XV **Course Code:** U-LAC-503
2.	M. Sc. BT II			**Course Title:** Advanced Pharmaceutical Biotechnology **Course Code:** P-PHB-433 **Course Title:** Lab Course XIII **Course Code:** P-LAC-436

1) Summary of Lesson Plan

Name of Teacher: Miss. Ashwini M. Devarshe **Class: B. Sc BT (Fourth Semester)**

Sr. No.	Subject	Unit and Chapter to be covered	No. of Lectures	Date	Academic activities to be organizer	No. of Test / Assignment
1	Process Biotechnology	**Unit 1** • Definition of Bioprocesses engineering. • Introduction to Simple engineering calculations,	01 02 03		Group Discussion	1)Class test on unit I:

		• Mass & Energy Balances. Oxygen uptake rate (OUR), KLa, Viscosity & its control. • Design of Fermenters: Construction, Design & Operation, • Materials of Constructions, Welding, Surface treatment Components of the fermenters & their specifications	03 03	17/ 12/2021 To 06/01/2022	Surprise test	2)Class test on Unit II: 3)Quiz competition.
		Unit II • Air Sterilization Principles, Mechanisms of capture of particles in Air, Depth & Screen Filters, Sizing, Testing & validation of filters for air Sterilization. • Principles of Media Sterilization, Decimal reduction, Design of sterilization, • Cycle using kinetics of thermal death of microbes Equipments used in sterilization; • Constituents of media, Media Optimization their estimation & quantification. Design of media. Costing of media	03 03 03 02	07/01/2022 To 26/02/2022	Quiz competition	
		Unit III: • Types of Bioprocesses: Biotransformation (enzyme, whole cell), Batch, Fed-batch, continuous. • Screening: Primary and Secondary Screening, • Preservation and Maintenance methods for Microbial culture. • Strain Improvement: Feedback Mechanism, Isolation of mutants which do not produce	02 02 02 03	27/02/2022 To 16/03/2022		

		feedback inhibitors or repressors. • Isolation of mutants which do not recognize presence of inhibitors or repressors. Modification of Permeability.	02			
		Unit IV: • Measurement & Control of Bioprocesses Parameters: Cell growth. pH, temperature, Substrate consumption, product formation, • Measurement of O2/CO2 uptake, evolution. • Specific rates of consumption substrate & formation of product. • Strategies for fermentation control. Foam & its control. • Computer controlled fermentations. • Scale up in Bioprocesses fermentations, Factors used in scale up.	03 01 02 02 01 02	17/03/2022 To 16/04/2022		

Sr. No.	Subject	Practical's	Date	No. of Practical's
1	Process Biotechnology	Isolation and Screening of Industrially important Microbes- Acid, Antibiotics, Enzymes	01/01/2022 To 16/04/2022	03
2		Strain improvement		03

3		Sterilization Techniques		03
4		Maintenance of pure Culture		03
5		Growth Curve		03
6		Growth kinetics: Effect of pH & Temp		03
7		Media Formulation		03
8		Sterilizer Design- TDP, TDT		03
9		Cell and Enzyme immobilization		03
10		Visit to Fermentation Industry		03

Name of Teacher: Miss. Ashwini M. Devarshe

Signature:

Name of Teacher: Miss. Ashwini M. Devarshe **Class: M. Sc BT (Second Semester)**

Sr. No.	Subject	Unit and Chapter to be covered	No. of Lectures	Date	Academic activities to be organizer	No. of Test / Assignment
1	Advanced Pharmaceutical Biotechnology	**Unit 1** • Chemotherapy Antimicrobial Drug. Mechanism of action of antimicrobial agents. • Microbial Resistance to antibiotics and antimicrobial agents (Types and Mechanism). • Types of Antibiotics: Classification of antibiotics with example. • General characteristics of an Secondary Metabolites • Types and Medicinal Applications	02 02 02 02 02	17/ 01/2022 To 10/02/2022	Group Discussion Surprise test Quiz comp-etition	1)Class test on unit I: 2)Class test on Unit II: 3)Quiz competition.

		Unit II • Chemotherapeutics Agents Structure • Mechanism of Action and Applications of Antibacterial drug: Sulfonamides, Quinolones. • Antiviral drug: Amantadine, Azido thymidine. • Antifungal drug: Nystatin, Griseofulvin. • Mechanism of action of Anticancer drugs, • Drugs acting on CNS, Insulin, Blood factor VIII.	01 02 02 02 02 02	11/02/2022 To 23/02/2022		
		Unit III: • Discovery and Development History, drug targeting, • Molecular Biology and Combinatorial drug discovery, • Rational Drug designing. Stability of Drug, • Pharmacokinetics, Pharmacodynamics. • Drug delivery systems, Liposomes.	02 02 02 02 02	24/02/2022 To 07/03/2022		

		Unit IV: • Clinical Trials Phases of Clinical trials of drugs, • Preclinical drug evaluation of its biological activity, potency and toxicity-Toxicity test in animals including acute, sub-acute and chronic toxicity, • ED50 and LD50 determination, special toxicity test like teratogenicity and mutagenicity. • Biosimilar Technology, Introduction to Indian, • International Pharmacopoeia and global regulatory guidelines.	03 03 03 03 03	08/03/2022 To 16/04/2022		

Sr. No.	**Subject**	**Practical's**	**Date**	**No. of Practical's**
1	Advanced Pharmaceutical Biotechnology	Estimation of penicillin/streptomycin by biological assay.	17/01/2022 To 16/04/2022	01
2		Estimation of penicillin/streptomycin by chemical assay.		01
3		Assay of antimicrobial activity of Penicillin, Chloramphenicol, streptomycin		01
4		Determination of Minimum Inhibitory Concentration (MIC) of Antibiotic		01
5		Determination of shelf life of antibiotics (Expired drugs)		01
6		Sterility testing of commercial pharmaceuticals.		01
7		Study of microbial spoilage of pharmaceuticals.		01

8		Sterility testing of injectable as per IP.		01
9		Effect of chemical disinfectant on growth of bacteria		01
10		Study of Pharmacopeia and global regulatory guidelines in pharma industry		01
11.		Study of drug action by using Zebra fish (Danio rerio) as model organism		01
12.		Visit to Pharmaceutical industry		01

Course Teacher

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