

Rajarshi Shahu Mahavidyalaya, (Autonomous) Latur
 Department of Microbiology
Annual Teaching Plan 2021-22

Name of the Faculty: Miss Sonali Shrikant Patil

Subject: Microbiology

Class: M.Sc. I (Sem. I)

Course Title: Bioinstrumentation

Paper No.: IV

Course Code: P-BIO-183

Details of the Classes to be taught

Sr. No.	Class	Name of teacher	Subject	Paper
2	M.Sc. I	MS. S. S. Patil	Microbiology	Paper: IV, P-BIO-183, VI, P-MIG-281
3	M.Sc. II			Paper: X, P-AMB-385, XIII, P-FMT-477
				M.Sc. I Lab Course: I, IV (Sem I), VI, VII (Sem II)

Unit	Unit and the chapter to be covered	No. of Lectures	Date	Academic activities to be organized	Test/Assignments
I	Unit-1: Laboratory techniques 1.1 Biosafety in microbiological laboratories 1.2 Theory, Principle, Working and Applications of a. pH meter b. Laminar Air Flow 1.3 Efficacy testing protocols for a. Autoclave, b. pH meter c. Laminar Air Flow. 1.4 Centrifuge machine types and Centrifugation 1.5 Rotor types and Ultra	15	27/09/2021 to 12/10/2021	Seminars	Assignment

	centrifugation.				
II	Unit 2: Chromatography Techniques 2.1 Theory, Principle, Apparatus, Methods and Applications of a. Paper Chromatography b. Thin Layer Chromatography (TLC) c. HPTLC d. Gel Filtration Chromatography e. Ion Exchange Chromatography f. Affinity Chromatography g. Gas Chromatography, and h. HPLC.	15	13/10/2021 to 08/11/2021	Seminars	Assignment
III	Unit III: Electrophoretic Techniques 3.1 Theory, Principle, Apparatus, Methods and Applications of a. Paper Electrophoresis, b. Polyacrylamide Gel Electrophoresis (PAGE), c. Agarose Gel Electrophoresis. 3.2 Principle and Applications of a. Iso-electric Focusing b. Immuno Electrophoresis c. Enzyme-Linked Immunosorbent Assay (ELISA) 3.4 Blotting Techniques	15	09/11 2021 to 25/11/2021	Seminars	Assignment
IV	Unit IV: Spectroscopic and Radio-isotopic Techniques 4.1 Principle, Working, Instrumentation and Applications of a. UV/Vis spectroscopy, b. IR spectroscopy,	15	26/11/2021 to 31/12/2021	Seminars	Class Test

<p>c. Atomic absorption spectroscopy, d. NMR spectroscopy, e. Mass spectroscopy, 4.2 Introduction to radioisotopes and their biological applications 4.3 Principles and Applications of a. Geiger Muller (GM) counter b. Solid and Liquid scintillation counter c. Autoradiography d. Radioimmunoassay (RIA)</p>				
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--	--	--



Subject Teacher



HEAD
HOD
Dept. of Microbiology
Rajarshi Sanku Mahavidyalaya
LA, R 41 12



Principal

Rajarshi Shahu Mahavidyalaya, (Autonomous) Latur

Department of Microbiology

Annual Teaching Plan 2021-22

Name of the Faculty: Miss Sonali Shrikant Patil

Subject: Microbiology

Class: M.Sc. II (Sem III)

Course Title: Advanced Molecular Biology

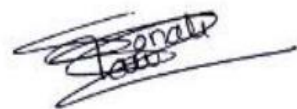
Paper No.: X

Course Code: P-AMB-385

Unit	Unit and the chapter to be covered	No. of Lectures	Date	Academic activities to be organized	Test/Assignments
I	Basic tools of r DNA Technology: 1.1 Enzymes used with their types, mode of activity and examples 1.2 Restriction endonucleases 1.3 DNA polymerase and enzymes 1.4 DNA ligation, DNA Manipulating enzymes 1.5 Cloning Vectors 1.6 Artificial chromosome vectors, Animal virus derived vectors. 1.6 Gene probes:	15	05/07/2021 to 12/08/2021	Seminars	Assignment
II	Nucleic acid amplification, Sequencing and Hybridization Techniques: 2.1 Polymerase Chain Reaction (PCR) 2.2 PCR in gene recombination 2.3 Methods of nucleic acid detection, sequencing methods 3.3 Methods of nucleic acid hybridization, DNA fingerprinting, chromosome walking and jumping.	15	13/08/2021 to 26/08/2021	Seminars	Assignment

III	Cloning and Screening methodologies: 3.1. Insertion of foreign DNA into the host cells. 3.2 Cloning and expression in yeast, animal and plant cells. 3.3. Plant transformation technology 3.4. Factors affecting expression in plants and animal cells, strategies to create knockout (KO) cells and transgenic animals. 3.5 cDNA and genomic cloning.	15	27/08/2021 to 21/09/2021	Seminars	Assignment
IV	Applications of rDNA technology and Legal issues: 4.1. Molecular Markers- types and applications. 4.2 Applications of recombinant DNA technology in medicine, agriculture, Forensic and veterinary sciences. 4.3 Engineering microbes for the production of antibiotics, enzymes, Insulin, growth hormones, monoclonal antibodies etc. Human genetic engineering and Gene therapy 4.4 Science and the constitution	15	22/09/2021 to 30/10/2021	Seminars	Class Test

Note: Five extra lectures are required for the completion of syllabus



Subject Teacher



HEAD
HOD
Dept. of Microbiology
Rajarshi Sahu Mahavidyalaya
LAHORE 41-12



Principal

Rajarshi Shahu Mahavidyalaya, (Autonomous) Latur
 Department of Microbiology
Annual Teaching Plan 2021-22

Name of the Faculty: Miss Sonali Shrikant Patil

Subject: Microbiology

Class: M.Sc. I (Sem-II)

Course Title: Microbial Genetics

Paper No.: VI

Course Code: P-MIG-281

Unit	Unit and the chapter to be covered	No. of Lectures	Date	Academic activities to be organized	Test/Assignments
I	Bacterial DNA Replication, Damage and Repair 1.1 Bacterial DNA Replication: 1.2 Types of damage: 1.3 DNA repair pathways:	15	03/02/2022 To 27/02/2022	Seminars	Assignment
II	Bacterial Transcription and Translation Process 2.1 Structure of RNA polymerase (RNAP), Transcription factors, Structure and Functions of different types of RNA, Promoter structure, Transcription cycle and Fidelity of transcription. 2.2 Structure of ribosomes, Genetic code, Initiation complex, Activation and functioning of tRNA, Translation cycle, Polysomes, Post-translational modifications (PTMs) and Recycling.	15	28/02/2022 To 15/03/2022	Seminars	Assignment
III	Regulation of Gene Expression in Bacteria 3.1 Common modes of	15	16/03/2022 To 02/04/2022	Seminars	Assignment

	regulation 3.2 Transcriptional regulation 3.3 Translational regulation 3.4 Regulation of gene expression in bacteriophages 3.5 Introduction to Quorum-sensing Regulation of Gene Expression in bacteria.				
IV	Genetic Recombination and Mapping in Bacteria 4.1 Background and perspectives of Genetic Recombination. 4.2 Introduction to different types of genetic maps. 4.3 Molecular mechanism of gene transfer and genetic mapping by:	15	05/04/2022 To 26/04/2022	Seminars	Class Test

Note: Five extra lectures are required for the completion of syllabus



Subject Teacher



HEAD
HoD
Dept. of Microbiology
Rajarshi State Mahavidyalaya
LAH 41-12



Principal

Rajarshi Shahu Mahavidyalaya, (Autonomous) Latur
 Department of Microbiology
Annual Teaching Plan 2021-22

Name of the Faculty: Miss Sonali Shrikant Patil

Subject: Microbiology

Class: M.Sc. II (Sem. IV)

Course Title: Fermentation Technology

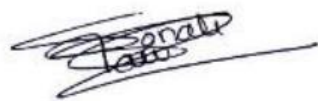
Paper No.: XIII

Course Code: P-FMT-477

Unit	Unit and the chapter to be covered	No. of Lectures	Date	Academic activities to be organized	Test/Assignments
I	Microbial Fermentations 1.1 Metabolic pathways and metabolic control mechanisms. 1.2 Industrial production of citric acid, lactic acid, acetic acid. 1.3 Industrial production of Acetone- butanol, Lysine and Glutamic acid. 1.4 Alcoholic beverages, distilled beverages. 1.5 Industrial production of enzymes 1.5 Some industrial techniques for whole cell and enzyme immobilization. 1.6 Application and advantages of cell and enzyme immobilization	15	17/12/2021 To 12/01/2022	Seminars	Assignment
II	Microbial production of therapeutic compounds 2.1 Microbial production of antibiotics 2.2 Industrial production of Peptide antibiotics 2.3 Microbial Transformation and Steroids	15	13/01/2202 to 16/02/2022	Seminars	Assignment

	and Sterols. 2.4 Vit.B-12 and riboflavin fermentation.				
III	Modern trends in microbial production 3.1 Modern trends in microbial production of bioplastics, Biopolymer 3.2 Biofertilizer 3.3 Single cell protein production 3.4 Useful features of biofuels. 3.5 Production of bioethanol 3.6 Microbial production of hydrogen gas, biodiesel from hydrocarbons.	15	17/02/2022 to 23/03/2022	Seminars	Assignment
IV	Intellectual Property Rights (IPR), Patent 4.1 Intellectual Property Rights (IPR) 4.2 Implication of patenting, current issues, hybridoma technology etc. 4.3 IPR and plant genetic resources (PGRs) Patenting of higher plants and animals, transgenic organisms and isolated genes, patenting of genes and DNA sequences, plant breeders right and farmers rights.	15	24/03/2022 To 16/04/2022	Seminars	Class Test

Note: Five extra lectures are required for the completion of syllabus



Subject Teacher



HEAD
HOD

Dept. of Microbiology
Rajarshi Sanku Mahavidyalaya
LA, R 41 - 12



Principal