

Annual Teaching Plan

Academic Year: 2023-2024

Semester: M. Sc. I Semester I

Department: Microbiology (PG)

Subject: Microbiology

Course Title: Paper IV-RMD20MIC11 - Research Methodology

Name of the teacher: Dr. K. K. Bhise

| Month: July | | | Module/Unit: | Sub-units planned | |
|------------------|------------|-------|--------------|--------------------------------------|------------------------------------------------|
| Lectures | Practicals | Total | | Theory | Practicals |
| - | - | - | - | - | - |
| Month: August | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | Unit I | Fundamentals of Research methodology | Practicals of Taxonomy and Microbial Diversity |
| 12 | 12 | 24 | Unit II | Interpretation and Report Writing | |
| Month: September | | | Module/Unit: | Sub-units planned | |
| 12 | 12 | 24 | Unit II | Report Writing | Practicals of Taxonomy and Microbial Diversity |
| | | | Unit III | Bioinformatics | |
| Month: October | | | Module/Unit: | Sub-units planned | |
| 12 | 12 | 24 | Unit IV | Biostatistics | Practicals of Taxonomy and Microbial Diversity |

Name and Signature of Teacher

Dr. K. K. Bhise

Dr. K. K. Bhise

Name and Signature of HOD

Dr. G. K. Sontakke

Dr. G. K. Sontakke
HEAD

DEPARTMENT OF MICROBIOLOGY
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)



Annual Teaching Plan

Academic Year: 2023-2024

Semester: M. Sc. II Semester III

Department: Microbiology (PG)

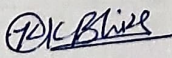
Subject: Microbiology

Course Title: Paper IX -CC-2412-Biostatistics, Bioinformatics And Scientific Writing


Name of the teacher: Dr. K. K. Bhise

| Month: July | | | Module/Unit: | Sub-units planned | |
|------------------|------------|-------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Lectures | Practicals | Total | | Theory | Practicals |
| - | - | - | | | |
| Month: August | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Theory | Practicals |
| 12 | 12 | 24 | Unit I | 1. Biostatistics, Basic concepts, 2. Collection and presentation of data 3. Descriptive statistics 4. Probability 5. Sampling methods | Practicals of Biostatistics, Bioinformatics And Scientific Writing |
| | | | Unit II | 1. Inference about populations 2. Hypothesis testing | |
| Month: September | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Theory | Practicals |
| 12 | 12 | 24 | Unit II | 3. Analysis of Variance 4. Correlation & Regression | Practicals of Biostatistics, Bioinformatics And Scientific Writing |
| | | | Unit III | 1. Bioinformatics, databases 2. Applications of Bioinformatics 3. Data visualization 4. Pattern matching and sequence alignment 5. Modeling and Simulation 6. Phylogenetic analysis | |
| Month: October | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Theory | Practicals |
| 12 | 12 | 24 | Unit IV | 1. Scientific Writing 2. Basic concepts of Scientific writing 3. Scientific Document 4. Compilation of record and programme of writing 5. Structure of a scientific paper 6. Presenting and publishing research | Practicals of Biostatistics, Bioinformatics And Scientific Writing |

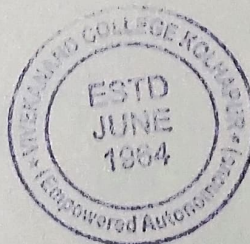
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Annual Teaching Plan

Academic Year: 2023-2024

Semester: M. Sc. I Semester II

Department: Microbiology (PG)

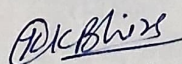
Subject: Microbiology

Course Title: Paper VII-DSE20MIC21- Medical Microbiology

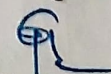
Name of the teacher: Dr. K. K. Bhise

| Month: January | | | Module/Unit: | Sub-units planned | |
|-----------------|------------|-------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | Theory | Practicals |
| Lectures | Practicals | Total | Unit I | 1. Virulence 2. Attributes of microorganisms that enable them to cause disease 3. Pathogen survival mechanisms 4. Collection and transport of clinical specimens | Practicals of medical microbiology |
| 12 | 12 | 24 | | | |
| Month: February | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Unit II | 1. Bacterial Diseases 2. Fungal Diseases |
| 12 | 12 | 24 | | | |
| Month: March | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Unit III | 1. Prevention and control of diseases caused by viruses 2. Diseases by Protozoa 3. Pathology of AIDS and prevalence of Tuberculosis, Mycoplasma and Cryptococcus infections 4. Special microbial metabolites and their applications in health care |
| 12 | 12 | 24 | | | |
| Month: April | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Unit IV | 1. B and T cell immune deficiency disorders 2. Complement disorders: complement component deficiency 3. Rheumatic disease 4. Atopic disease |
| 12 | 12 | 24 | | | |

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Annual Teaching Plan

Academic Year: 2023-2024

Semester: M. Sc. II Semester IV

Department: Microbiology (PG)

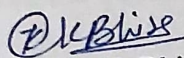
Subject: Microbiology

Course Title: Paper XII-CC-2415-Quality Control Microbiology – I

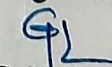
Name of the teacher: Dr. K. K. Bhise

| Month: July | | | Module/Unit: | Sub-units planned | |
|------------------|------------|-------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Lectures | Practicals | Total | | Theory | Practicals |
| - | - | - | - | - | - |
| Month: August | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Theory | Practicals |
| 12 | 12 | 24 | Unit I | 1. Design of Basic laboratories 2. Biosafety Levels 1 and Biosafety Levels 2 3. The containment laboratory – Biosafety Level 3 4. The maximum containment laboratory – Biosafety Level 4 | Practicals of quality control microbiology-I |
| | | | Unit II | 1. Good microbiological techniques- 2. Handling of specimen 3. Use of pipette, BSC | |
| Month: September | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Theory | Practicals |
| 12 | 12 | 24 | Unit II | 4. Opening of ampoules and storage, Standard precautions with blood and body fluids 5. Contingency grants and emergency procedures | Practicals of quality control microbiology-I |
| | | | Unit III | 1. Sterilization and methods 2. Sterility assurance tests | |
| Month: October | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Theory | Practicals |
| 12 | 12 | 24 | Unit IV | 1. Biosafety Guidelines 2. BSC-Class I, II, III 3. Safety equipments | Practicals of quality control microbiology-I |

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Annual Teaching Plan

Academic Year: 2023-2024

Semester: M. Sc. II Semester IV

Department: Microbiology (PG)

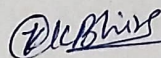
Subject: Microbiology

Course Title: Paper XV-CC2420-Recombinant DNA Technology

Name of the teacher: Dr. K. K. Bhise

| Month: January | | | Module/Unit: | Sub-units planned | |
|-----------------|------------|-------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Lectures | Practicals | Total | | Theory | Practicals |
| 12 | 12 | 24 | Unit I | 1. Enzymes 2. Linkers and adapters 3. Cloning vectors 4. Gene probes | Practicals of recombinant DNA technology |
| | | | | | |
| Month: February | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Theory | Practicals |
| 12 | 12 | 24 | Unit II | 1. Basic Cloning Strategies- General principals 2. Cloning in <i>Escherichia coli</i> and other bacteria 3. Screening of gene libraries 4. Sigmoid kinetics – Hill and Adair equations 5. for co operativity 6. Expression of foreign DNA in transformed 7. Bacteria | Practicals of recombinant DNA technology |
| | | | | | |
| Month: March | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Theory | Practicals |
| 12 | 12 | 24 | Unit III | 1. Cloning in yeast and fungi 2. Cloning in animals 3. Cloning in plant | Practicals of recombinant DNA technology |
| | | | | | |
| Month: April | | | Module/Unit: | Sub-units planned | |
| Lectures | Practicals | Total | | Theory | Practicals |
| 12 | 12 | 24 | Unit IV | 1. Applications of rDNA Technology | Practicals of recombinant DNA technology |
| | | | | | |

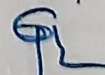
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Annual Teaching Plan

Academic Year: 2023-2024

Semester: M. Sc. II Semester IV

Department: Microbiology (PG)

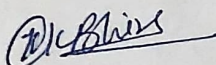
Subject: Microbiology

Course Title: Paper XVI-CC2421- Quality control Microbiology-II


Name of the teacher: Dr. K. K. Bhise

| Month: January | | | Module/Unit: | Sub-units planned | |
|-----------------|------------|-------|--------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| | | | | Theory | Practicals |
| Lectures | Practicals | Total | Unit I | Pharmaceutical Drug Regulatory Affairs | Practicals of Quality control Microbiology-II |
| 12 | 12 | 24 | | | |
| Month: February | | | Module/Unit: | Sub-units planned | |
| | | | | Theory | Practicals |
| Lectures | Practicals | Total | Unit II | Cleanrooms and environmental monitoring | Practicals of Quality control Microbiology-II |
| 12 | 12 | 24 | | | |
| Month: March | | | Module/Unit: | Sub-units planned | |
| | | | | Theory | Practicals |
| Lectures | Practicals | Total | Unit III | 1. Bioburden determination 2. Endotoxin and pyrogen testing | Practicals of Quality control Microbiology-II |
| 12 | 12 | 24 | | | |
| Month: April | | | Module/Unit: | Sub-units planned | |
| | | | | Theory | Practicals |
| Lectures | Practicals | Total | Unit IV | 1. Quality Management Systems in Pharmaceutical Manufacturing 2. Auditing the microbiology laboratory | Practicals of Quality control Microbiology-II |
| 12 | 12 | 24 | | | |

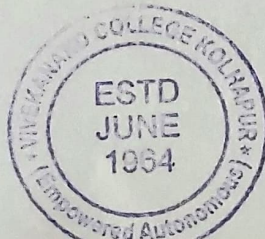
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Annual Teaching Plan

Academic Year: 2023-2024

Semester: M. Sc. I Semester I

Department: Microbiology (PG)

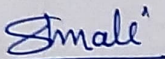
Subject: Microbiology

Course Title: Paper II Immunology DSC20MIC12


Name of the teacher: Dr. S. D. Mali

| Month: July | | | Module/Unit: | Sub-units planned-theory | Sub-units planned-practicals |
|------------------|------------|-------|--------------|---------------------------------------------------------------------------------------------------------------------|------------------------------|
| Lectures | Practicals | Total | Unit I | 1. MHC complex 2. Signal transduction 3. T-cell sensitization | Practicals of Immunology |
| 12 | 4 | 16 | | | |
| Month: August | | | Module/Unit: | Sub-units planned-theory | Sub-units planned-practicals |
| Lectures | Practicals | Total | Unit II | 1. Complement System 2. Genetics of Ab synthesis 3. Antibody diversity 4. Immunomodulation, 5. Vaccines | Practicals of Immunology |
| 12 | 4 | 16 | | | |
| Month: September | | | Module/Unit: | Sub-units planned-theory | Sub-units planned-practicals |
| 12 | 4 | 16 | Unit III | 1. Transplantation immunology 2. Tumour immunology | Practicals of Immunology |
| Month: October | | | Module/Unit: | Sub-units planned-theory | Sub-units planned-practicals |
| 12 | 4 | 16 | Unit IV | 1. Serodiagnosis of diseases 2. Immunochemical techniques 3. PCR based diagnostic tests | Practicals of Immunology |

Name and Signature of Teacher


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Annual Teaching Plan

Academic Year: 2023-2024

Semester: M. Sc. I Semester II

Department: Microbiology (PG)

Subject: Microbiology

Course Title: Paper V Microbial Physiology, Biochemistry & Metabolism DSC20MIC15

Name of the teacher: Dr. S. D. Mali

| Month: January | | | Module/ Unit: | Sub-units planned-Theory | Sub-units planned- Practicals |
|-----------------|------------|-------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Lectures | Practicals | Total | Unit I | 1. Carbohydrate metabolism 2. Oxidation of hydrocarbons 3. Oxidation of fatty acids and phospholipids 4. Catabolism of amino acids 5. Pasteur and Crabtree effect 6. Autotrophy | Practicals of Microbial Physiology, Biochemistry & Metabolism |
| 12 | 4 | 16 | | | |
| Month: February | | | Module/ Unit: | Sub-units planned - Theory | Sub-units planned- Practicals |
| Lectures | Practicals | Total | Unit II | 1. Respiratory metabolism 2. Photo-phosphorylation 3. Drug metabolism in the body 4. Fermentation of bacteria | Practicals of Microbial Physiology, Biochemistry & Metabolism |
| 12 | 4 | 16 | | | |
| Month: March | | | Module/ Unit: | Sub-units planned - Theory | Sub-units planned- Practicals |
| 12 | 4 | 16 | Unit III | 1. Protein chemistry 2. Biosynthesis of amino acids 3. Lipid metabolism 4. Phospholipid biosynthesis 5. Purine and pyrimidine biosys. | Practicals of Microbial Physiology, Biochemistry & Metabolism |
| Month: April | | | Module/ Unit: | Sub-units planned- Theory | Sub-units planned- Practicals |
| 12 | 4 | 16 | Unit IV | 1. Osmosis 2. Permeation 3. Biosignaling 4. Microbial hormones and quorum sensing | Practicals of Microbial Physiology, Biochemistry & Metabolism |

Name and Signature of Teacher

S. D. Mali

Dr. S. D. Mali

Name and Signature of HOD

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Annual Teaching Plan

Academic Year: 2023-2024

Semester: M. Sc. II Semester III

Department: Microbiology (PG)

Subject: Microbiology

Course Title: Paper X Enzymology & Enzyme Technology CC-2413

Name of the teacher: Dr. S. D. Mali

| Month: July | | | Module/Unit: | Sub-units planned | |
|------------------|------------|-------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| | | | | Theory | Practicals |
| Lectures | Practicals | Total | Unit I | 1. History and properties of enzymes 2. Nomenclature and classification of enzymes 3. Specificity of enzymes: 4. Structure of enzymes 5. Methods employed to identify functional groups in the active site 6. Catabolism of amino acids 7. Co-factors in enzyme action | Practicals of enzymology |
| 12 | 4 | 16 | | | |
| Month: August | | | Module/Unit: | Theory | Practicals |
| Lectures | Practicals | Total | Unit II | 1. Kinetics of single-substrate enzyme catalysed reactions 2. Kinetics of multisubstrate reactions 3. Haldane's relationship for reversible reactions 4. Sigmoid kinetics – Hill & Adair equations 5. Enzyme inhibition | Practicals of enzymology |
| 12 | 4 | 16 | | | |
| Month: September | | | Module/Unit: | Theory | Practicals |
| 12 | 4 | 16 | Unit III | 1. Covalent modification of enzyme structure 2. Ligand induced changes 3. Multienzyme systems 4. Membrane bound enzymes in metabolic regulation 5. Isoenzymes | Practicals of enzymology |
| | | | | | |



| Month: October | | | Module/Unit: | Theory | Practicals |
|----------------|---|----|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 12 | 4 | 16 | Unit IV | 1. Applications of enzymes in medicine 2. Industrial applications of enzymes 3. Enzymes as analytical tools 4. Immobilisation of enzymes 5. Newer approaches to the 6. application of enzymes | Practicals of enzymology |

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Annual Teaching Plan

Academic Year: 2023-2024

Semester: M. Sc. II Semester IV

Department: Microbiology (PG)

Subject: Microbiology

Course Title: Paper XIII Food and Dairy Technology CC-2418

Name of the teacher: Dr. S. D. Mali

| Month: January | | | Module/Unit: | Sub-units planned | |
|-----------------|------------|-------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| | | | | Theory | Practicals |
| Lectures | Practicals | Total | Unit I | 1. Food as a substrate for Microorganisms 2. General principles underlying microbial spoilage of food 3. Microbial spoilage of meat, fruits and vegetables 4. Microbial spoilage of heated canned food 5. General principles of Preservation of food 6. Methods of food preservation | Practicals of Food and Dairy Technology |
| 12 | 4 | 16 | | | |
| Month: February | | | Module/Unit: | Sub-units planned | |
| | | | | Theory | Practicals |
| Lectures | Practicals | Total | Unit II | 1. Milk: Definition, composition, Factors affecting composition, Nutritive value of milk 2. Spoilage of milk and milk products 3. Fermented food | Practicals of Food and Dairy Technology |
| 12 | 4 | 16 | | | |
| Month: March | | | Module/Unit: | Sub-units planned | |
| | | | | Theory | Practicals |
| Lectures | Practicals | Total | Unit III | 1. Food born diseases 2. Prevention and control of food borne diseases 3. Fermented dairy products and their role in controlling food borne diseases | Practicals of Food and Dairy Technology |
| 12 | 4 | 16 | | | |
| Month: April | | | Module/Unit: | Sub-units planned | |
| | | | | Theory | Practicals |
| Lectures | Practicals | Total | Unit IV | 1. Probiotics 2. Enzymes in food processing 3. Applications of enzymes 4. Food safety and standards | Practicals of Food and Dairy Technology |
| 12 | 4 | 16 | | | |

Name and Signature of Teacher

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