



TELANGANA SOCIAL WELFARE RESIDENTIAL  
DEGREE COLLEGES

TSWRDC Mancherial

DEPARTMENT OF MICROBIOLOGY

SEMESTER PLAN — pqpcn Tn+tOc-

Luch0.RJ bio 103 y



TELANGANA SOCIAL WELFARE RESIDENTIAL DEGREE COLLEGES

NTllne of the College ——— TSWRDC Manchrial—————

SEMESTER PLAN

Names of the Course	B.Sc. IMZC SEMESTER r
Subject	MICROBIOLOGY
Paper Name	INTRODUCTORY MICROBIOLOGY
Paper Code	
Learning Outcomes	<ul style="list-style-type: none"> <li>• The study of microbes helps us to understand our world and o place within it. It gives us insights into the complexity of nature an society, which in turn provide many different health, environmental, social, cultural, industrial, and economic benefits</li> <li>• Microbiology is the scinccc that deals with the study o microorganisms. The term microbiology derives its name fro three Greek words mikros [small] bios [life] and logos [study]. Microorganisms are tiny and invisible to the naked eye. So, the can be looked into and studied only with the help of a microscope.</li> </ul> <p>This chapter in understanding the contributions of most eminent scientist towards the field of Microbiology like Antonie van Leeuwenhoek (1632—1723) was one of the first people to observe microorganisms, using a microscope of his own design, and made one of the most important contributions to biology. Robert Hooke was the first to use a microscope to observe living things. Pasteu dealt the death blow to the theolY of spontaneous generation an supported germ theory instead. .</p> <p>Ferdinand Julius Cohn (January 24, 1828 — June 25, 1898) was German biologist. His glassitication of bacteria into four groups based on shape (sphericals, shon rods, threads, and . spirals) is still i use today</p> <p>In 1876, Robert Koch (1843—1910) established that microbes can caus disease. I-le found that the blood of cattle who were infected with anthrac always had large nunbers of Bacillus anthracis.</p>

Faculty Name	Dr. Kuraganti Gunaswetha
--------------	--------------------------

Unit-I Title	Topic	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities, etc.,	No. of Hours
po	Definition, Scope and History of Microbiology	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Blackboard Curricular : Assignment on the importance of WRM Extra-curricular : Questionnaire	
	Contributions of Scientist: Antony Van Leeuwenhoek, Edward Jenner	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Blackboard Curricular : Assignment Extra-curricular : Group Discussion	
	Louis Pasteur, Robert Koch	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples Extra-curricular : Group Discussion	
	Iwanoswky, Beijernik	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples Extra-curricular : Group Discussion	02 w
	Winogradsky, Alexander Fleming	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Blackboard Curricular : Seminar on Hydrological cycle Extra-curricular : Group Discussion	
	Physical Methods of Sterilization	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples Extra-curricular : Group Discussion	
	Chemical methods of Sterilization	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples Extra-curricular : Make a handout of topics to discuss in class	03

Vunit-I	Topics	Teaching Pedagogy, Teaching Aids, Curricular. Extra-curricular Activities etc.,	Hours
	Principle and applications of Bright field Microscopy	Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board Curricular : Assignment and MCQs Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board	
	Principle and applications of Dark field Microscopy	Curricular : Assignment and MCQs Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board	
	Principle and applications of Phase contrast Microscopy	Curricular : Assignment and MCQs Extra-curricular : More written exams to be by instructor at various points throughout the course Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board	02-
	Principles and Applications of Fluorescence Microscopy	Curricular : Assignment and MCQs Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board	01
	Principles and applications of Electron SEM TEM Microscopy	Curricular : Assignment and MCQs and Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board	09.
	Ocular and Stage Microscopy	Curricular : Assignment, MCQs and Group discussion Extra-curricular : Make a handout of topics to discuss in Class Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board	02
	Principles and types of stains	Curricular : Assignment and Group discussion Extra-curricular : Make a handout of topics to discuss in class Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board	05

Unit-3 Title	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
Classification, Isolation, and Identification of Microorganisms	Classification of Living organisms: Haeckel, Whittaker, Carl Woese systems	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Assignment Extra-curricular : Essay Writing	
	Differentiation of Prokaryotic and Eukaryotic cells	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Assignment and Group discussion Extra-curricular : Make a handout of topics to discuss in class	
	Classification and Identification of Bacteria: Bergey's manual of systematic bacteriology	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Group discussion and MCQ's Extra-curricular : Make a handout of topics to discuss in class	
	Growth Media: Synthetic, Semisynthetic, selective, differential	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Assignment Extra-curricular : Make a handout of topics to discuss in class	03
	Isolation of Pure culture techniques	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Objective assessments (multiple choice and fill in the blank) Extra-curricular : Do the reading and problem sets	03
	Preservation of Microbial cultures	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Assignment Extra-curricular : Do the reading and problem sets	
	Classification of protozoa, Fungi and algae	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Assignment Extra-curricular : Do the reading and problem sets	

Structural Stains

Curricular : Assignment and Group discussion  
Extra-curricular : Make a handout of topics to discuss in Class

Unit-4 Title	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
Structure and General characteris Microorganisms	General characteristics of Prokaryotes	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Group discussion Extra-curricular : Interactive session	03
	Ultra structure of bacterial Cellwall	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Assignment and group discussion Extra-curricular : Review lecture notes and search for new auto immune diseases	03
	General characteristics of Eukaryotes	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : MCQs and Assignment Extra-curricular : Prepare an outline of issues to cover in class	06
	General characteristics and classification of viruses	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Practical and Group Discussion Extra-curricular : Interactive session	
	TMV, HIV	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : Practical and Group Discussion Extra-curricular : Do the reading and problem sets	
Total Hours :			

Swamy  
21/9/23

PRINCIPAL  
TSWRDC (N)  
MANCHERIAL

TELANGANA SOCIAL WELFARE,

COLLEGE,s

Name of the Course

B.Sc. MZC J

Subject

B.Sc. MZC J

Paper Name

Microbiology

Paper Code

Microbiology and Biochemistry

By the end of the course, the student will be able to

1. Apply the knowledge to understand microbial physiology and to identify

2. Understand the regulation of biochemical pathways and possible processes improved control over microorganisms for microbial product synthesis.

Understand the microbial nutrition and how they are classified based on their nutrients to understand the Photosynthetic apparatus of prokaryotes and their working principle. To understand the Phases of bacterial growth and how different factors affect their growth, Methods of measuring the bacterial growth via viable count, turbidity assay

Learning Outcomes

To understand the microbial metabolism through oxygenic and anoxygenic photosynthesis along with microbial respiration via Glycolysis, EMP, ED pathways, TCA cycle, electron transport chain, and oxidative substrate-level phosphorylation

To understand the Biomolecules: Classification and general characteristics of Carbohydrates, amino acids, proteins, fatty acids and lipids, Structure of nitrogenous bases, nucleotides and nucleic acid. To understand the properties and classification of enzymes. Their biocatalysis properties.

To Understand the working of principles of Biochemical techniques

To understand the hydrogen ion concentration in biological fluids, how to measure it, Preparation of buffers and their characteristics understand the principles and applications of Agarose gel electrophoresis and SDS

Faculty Name

J. K. Uraganti Gunaswetha

Name of the College

TELANGANA SOCIAL WELFARE RESIDENTIAL TSWRDC  
Mancherial DEGREE COLLEGES

Names of the Course

Subject  
Paper Name  
Paper Code

## SEMESTER PLAN

B.Sc. MZC I Year  
SEMESTER - 11  
Microbiology

### Microbial Physiology and Biochemistry

By the end of the semester, the students will be able to

I. Apply the knowledge to understand microbial physiology and to identify

2. Understand the regulation of biochemical pathways and possible process modifications for improved control over microorganisms for microbial product synthesis.

o To understand the different modes of microbial nutrition and how they are classified based on their uptake of nutrients

To understand the Photosynthetic apparatus of prokaryotes and their working principle

To understand the Phases of bacterial growth and how different factors affect their growth, methods of measuring the bacterial growth via viable count, turbidometry

To understand the microbial metabolism through oxygenic and anoxygenic photosynthesis along with microbial respiration via Glycolysis, EMP, ED pathways, TCA cycle, electron transport chain, and oxidative substrate-level phosphorylation

To understand the Biomolecules: Classification and general characteristics of Carbohydrates, amino acids, proteins, fatty acids and lipids, Structure of nitrogenous bases, nucleotides and nucleic acid To understand the properties and classification of enzymes. Their biocatalytic properties.

To understand the working principles of Biochemical techniques

To understand the hydrogen ion concentration in biological fluids, how to measure the

pH, Preparation of buffers and their characteristics electrophoresis To

understand the SDS principles PAGE and applications of Agarose gel

Learning Outcomes

Faculty Name  
Name of the College

Dr. Kuraganti Gunaswetha



Unit-I Title	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities, etc.,	Hours
Microbial Nutrition and Growth	Microbial Nutrition & Uptake of nutrients by cell	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment on the Microbial nutrition and different modes of their uptake Extra-curricular : Group Discussion	
	Nutritional groups: Autotrophs, Heterotrophs, Mixotrophs & Methylophiles	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment & Class Discussion Extra-curricular : Group Discussion	
	Photosynthetic apparatus in prokaryotes	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples Extra-curricular : Group Discussion	04
	Bacterial growth- Different phases of growth	Teaching Pedagogy : Descriptive & Practical Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples Extra-curricular : Group Discussion	
	Factors influencing bacterial growth	Teaching Pedagogy : Descriptive & Practical Teaching Aids : PowerPoint & Blackboard Curricular : Seminar on Growth factors & Practical report submission Extra-curricular : Group Discussion	
	Synchronous, Continuous, Biphasic growth	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples Extra-curricular : Group Discussion	
	Methods for measuring microbial growth- Direct Microscopic, Viable count, Turbidometry	Teaching Pedagogy : Descriptive & Practical Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples & Practical report submission Extra-curricular : Make a handout of topics to discuss in class	

Unit-2 Title	Topic	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
	Bacterial photosynthesis: Outline of oxygenic and anoxygenic	Teaching Pedagogy : Instructive, descriptive & practical Teaching Aids : PowerPoint & Blackboard Curricular : Assignment and MCQs Extra-curricular	

photosynthesis in bacteria	*'tra-curricular : More written exams to be scheduled by instructor at various points throughout the course	
Microbial respiration- Aerobic	reaching Pedagogy : Instructive and descriptive	
Glycolysis, JIMP pathway,	reaching Aids : PowerPoint & Black board	
ED pathway, TCA Cycle	Curricular : Assignment and MCQs	03
	Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course	
Anaplerotic reactions, Electron transport,	reaching Pedagogy : Instructive and descriptive	03
	Teaching Aids : PowerPoint & Black board	
Oxidative and Substrate level phosphorylation	Curricular : Assignment and MCQs and	02-
	Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course	
Glyoxylate cycle, Nitrate anaerobic respiration	Teaching Pedagogy : Instructive and descriptive	
discussion	Teaching Aids : PowerPoint & Black board	
	Curricular : Assignment, MCQs and Group discussion	
	[Extra-curricular : Make a handout of topics to discuss in class	
	Teaching Pedagogy : Instructive and descriptive	
Sulphate anaerobic respiration	Teaching Aids : PowerPoint & Black board	0 1
	Curricular : Assignment and Group discussion	
	Extra-curricular : Make a handout of topics to discuss in class	
	reaching Pedagogy, Teaching Aids : PowerPoint & Black board	
	No. of (Activities etc., Hours	
	Practical & Black board	
	III	
	lay Writing,	
	Descriptive	
	PowerPoint & Black board	
01		
	and Group	
Flittynoids (Saturated and	lipids, Sterols, phospholipids	

Structure Nitrogenous bases  
 Extra-curricular: Make a handout of topics to discuss in class  
 Teaching Pedagogy : Descriptive  
 Teaching Aids : PowerPoint & Black board  
 Curricular : Assignment

Structure nucleotides and nucleic acids  
 Extra-curricular : Make a handout of topics to discuss in class  
 Teaching Pedagogy : Descriptive  
 Teaching Aids : PowerPoint & Black board  
 Curricular : Objective assessments (multiple choice and fill in the blank)

Properties and classification of enzymes.  
 Extra-curricular : Do the reading and problem sets  
 Teaching Pedagogy : Descriptive  
 Teaching Aids : PowerPoint & Black board  
 Curricular : Assignment

Biocatalysis- Induced fit and Lock & Key Model  
 Extra-curricular : Do the reading and problem sets  
 Teaching Pedagogy : Descriptive  
 Teaching Aids : PowerPoint & Black board  
 Curricular : Assignment

Coenzymes, Co-factors, Factors affecting activity  
 Extra-curricular : Do the reading and problem sets  
 Teaching Pedagogy : Descriptive  
 Teaching Aids : PowerPoint & Black board  
 Curricular : Assignment

Extensive Make a handout of topics to discuss in class  
 Teaching Pedagogy : Descriptive  
 Teaching Aids : PowerPoint & Black board  
 Curricular : Assignment

Extensive Descriptive  
 Teaching Pedagogy : Descriptive  
 Teaching Aids : PowerPoint & Black board  
 Curricular : Assignment  
 Extra-curricular : Do the reading and problem sets

Unit-4 Topic	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
Biochemical techniques	Hydrogen ion concentration in biological fluids	Teaching Pedagogy : Descriptive & Practical Teaching Aids : PowerPoint & Black board Curricular : Group discussion Extra-curricular : Interactive session	
	pH Measurement	Teaching Pedagogy : Descriptive & Practical Teaching Aids : PowerPoint & Black board Curricular : Assignment and group discussion Extra-curricular : Review lecture notes and search for new auto immune diseases	
	Types of buffers and their uses in biological reactions	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : MCQs and Assignment Extra-curricular : Prepare an outline of issues to cover in class	03

	Principles and application of colorimetry and chromatography (Paper and Thin layer)	Teaching Pedagogy : Descriptive & Practical Teaching Aids : PowerPoint & Black board Curricular : Practical and Group Discussion Extra-curricular : Interactive session	03
	Principles and applications of Electrophoretic techniques introduction	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : Practical and Group Discussion Extra-curricular : Do the reading and problem sets	
	Agarose gel electrophoresis & SDS PAGE	Teaching Pedagogy : Descriptive & Practical Teaching Aids : PowerPoint & Black board Curricular : Practical and Group Discussion Extra-curricular : Do the reading and problem sets	
Total Hours			

*K. A. ...*

*...*  
22/01/24

PRINCIPAL  
TSWRDC (M)  
MANCHERAL



TELANGANA SOCIAL WELFARE RESIDENTIAL DEGREE COLLEGES

Name of the College TSWRDC Mancherial

Names of the Course	B.Sc. MZC II YEAR SEMESTER – III
Subject	MICROBIOLOGY
Paper Name	MEDICAL MICROBIOLOGY AND BASICS OF IMMUNOLOGY
Paper Code	
Learning Outcomes	<p>Upon successful completion, students will be able to :</p> <p>Understands the concept of Normal flora and their importance and different defence mechanisms</p> <p>Understands the different microorganisms causing Air borne, Food and water borne, zoonotic, insect-borne, contact diseases, Blood borne diseases.</p> <p>Understands the need of vaccination.</p> <p>Differentiate between active and passive immunity</p> <p>Understands the function of various lymphoid organs</p> <p>Understands the maturation sites of the immune cells</p> <p>Understands the antigen and antigenicity</p> <p>Understands basic structure of immunoglobulins</p> <p>Understands the type of antigen antibody reactions and learn the terms associated with it.</p> <p>Understands the Hypersensitivity reactions</p>
Faculty Name	K.SHIVALEELA

*K. Shivalleela*  
Dept. of Microbiology  
TSWRDC (W), Mancherial

# SEMESTER PLAN

Unit-I Title	OPICS	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities, etc.	No. of Hours
	History of Medical Microbiology. Normal flora of human body.	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Blackboard Curricular : Assignment xtra-curricular : Questionnaire	<b>5</b>
	Host pathogen interactions. Bacterial toxins, virulence and attenuation. Antimicrobial resistance. Air-borne diseases — Tuberculosis. Food and water-borne diseases Cholera, Typhoid	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Blackboard Curricular : Assignment xtra- curricular : Group Discussion	<b>5</b>
	Contact diseases - Syphilis, Gonorrhoea. General account of Nosocomial infections.	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples, practicals xtra-curricular : Group Discussion	

Unit-2 Title	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
	Air borne diseases – Influenza. Food and water-borne diseases – Poliomyelitis, Amoebiasis.	Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board Curricular : Assignment and MCQs Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course	5
	Insect-borne diseases - Malaria, Dengue fever. Zoonotic diseases – Rabies	Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board Curricular : Assignment, MCQs and Practicals Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course	5
	Viral diseases - Hepatitis B, HIV, SARS, MERS;	Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board Curricular : Assignment and MCQs Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course	5



Unit-3 Title	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
	1. History of Immunology, Cells and Organs of the immune system - primary and Secondary lymphoid organs. • Function of B and T lymphocytes. Natural Killer cells, Polymorphonuclear cells.	Teaching Pedagogy : PowerPoint : Descriptive & Black board Curricular : Assignment Extra-curricular : Make a handout of topics to discuss in class	5
	2. Structure and Classification of antigens, Factors affecting antigenicity. Antibodies: Basic structure, Types of properties and functions of immunoglobulins	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Assignment and Group discussion Extra-curricular : Make a handout of topics to discuss in class	5
	3. Types of Immunity: Innate and Acquired immunity, Humoral and cell-mediated immune response	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Group discussion and MCQ's Extra-curricular : Make a handout of topics to discuss in class	6

Unit-4 Title	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
	1. Types of hyper sensitivity reactions — immediate and delayed. Systemic and localized autoimmune disorders. Complement pathways - Classical and Alternative pathways.	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Group discussion Extra-curricular : Interactive session	
	2. Types of antigen-antibody reactions — agglutinations, Precipitation, neutralization, Blood groups.	Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Assignment and group discussion Extra-curricular : Make a handout of topics to discuss in class	5

omplement fixation Test. Labeled antibody based techniques — ELISA, and immunofluorescence; polyclonal and Monoclonal antibodies production and application

teaching Pedagogy : Descriptive teaching  
Aids : PowerPoint & Black board

Curricular : MCQs and Assignment , extra-curricular : Prepare an outline of issues to cover in class

Unit-5 Title	Topics	No. of Hours
	Enumeration of RBC and WBC	
	Estimation of blood haemoglobin	
	Determination of blood groups and Rh typing.	
	Isolation and identification of medically important bacteria by cultural, microscopic and biochemical tests.	
	Antibiotic sensitivity testing — disc diffusion method.	
	Parasites — Malarial parasite, amoeba (study of permanent slides)	
	Tests for disinfectant (Phenol coefficient).	
	Typing of human blood groups-slide agglutination	
	Estimation of hemoglobin content of human blood	
	Preparation of blood smear and differential blood cell count	
	RBC count	
	WBC count	



*K. Feela*  
 Dept. of Microbiology  
 TSWRDC (M), Mancherial

*Surya*

PRINCIPAL  
 TSWRDC AM



**MANCHERN**  
**TELANGANA SOCIAL WELFARE RESIDENTIAL DEGREE COLLEGES**

Name or the College      TSWRDC Mancherial

**SEMESTER PLAN**

Names of the Course	<b>B.Sc. MZC II YEAR SEMESTER - II</b>
Subject	MICROBIOLOGY
Paper Name	MOLECULAR BIOLOGY AND MICROBIAL GENETICS
Paper Code	
Learning Outcomes	<p>Upon successful completion, students will be able to :</p> <ul style="list-style-type: none"> <li>Understands the prokaryotic and Eukaryotic cell organelles</li> <li>Understands the difference between prokaryotic and eukaryotic cells</li> <li>Understands the gene, alleles, Mendel laws</li> <li>Understands the DNA and RNA structure, replication, transcription and translation.</li> <li>Different methods of transferring the genetic material in bacteria</li> <li>DNA damage and repair mechanisms</li> <li>Understands one gene one enzyme, one gene one polypeptide, one gene one product hypothesis.</li> <li>Understands Genetic code</li> <li>Understands types of genes, operon concept, lac operon</li> <li>Understands basic principle of genetic engineering and applications of genetic engineering in industry, agriculture and medicine</li> </ul>
Faculty Name	<b>K.SHIVALEELA</b>

Unit-I	OPICS	Teaching Pedagogy, Teaching Aids,	No. of
--------	-------	-----------------------------------	--------

Title	Curricular, Extra-curricular Activities, etc.,	Hours
Overview of prokaryotic and eukaryotic Cells, cell size and shape	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment Extra-curricular : Questionnaire	5
Eukaryotic and prokaryotic cell organelles, cell division	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment Extra-curricular : Group Discussion	3
Fundamentals of genetics- Mendelian laws, alleles, crossing over and linkage	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples, practicals Extra-curricular : Group Discussion	5
DNA and RNA as genetic material	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples Extra-curricular : Group Discussion	4
Structure of DNA- Watson and Crick model	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment Extra-curricular : Group Discussion	4
Extrachromosomal genetic elements- Plasmids and transposons	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples Extra-curricular : Group Discussion	4
Replication of DNA	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples Extra-curricular : Make a handout of topics to discuss in class	4

Unit-2 Title	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
	Brief account on horizontal gene transfer among bacteria	Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board Curricular : Assignment and MCQs Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course	
	Mutations	Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board Curricular : Assignment, MCC); and Practicals Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course	
	Lines of DNA damage and Repair mechanisms	Teaching Pedagogy : Instructive and descriptive Teaching Aids : PowerPoint & Black board Curricular : Assignment and MCQs •Extra-curricular : More written exams to be scheduled by instructor at various points throughout the course	3
Unit-3 Title	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
	Concept of gene	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : Assignment Extra-curricular : Make a handout of topics to discuss in class	

one gene one enzyme	eaching Pedagogy : Descriptive eaching Aids : PowerPoint & Black board	2-
---------------------	--	----

one gene one polypeptide

Curricular : Assignment and Group discussion  
 •Extra-curricular : Make a handout of topics to discuss in class eaching Pedagogy : Descriptive eaching Aids : PowerPoint & Black board

one gene one product hypothesis

\*utTicular : Group discussion and MCQ's  
 : Make a handout of topics to discuss in class eaching Pedagogy : Descriptive eaching Aids : PowerPoint & Black board

Types of RNA and their functions.

Curricular : Assignment  
 Extra-curricular : Make a handout of topics to discuss in class eaching Pedagogy : Descriptive

Outlines of RNA biosynthesis in prokaryotes

eaching Aids : PowerPoint & Black board  
 Curricular : Objective assessments (multiple choice and fill in the blank) xtra-curricular : Do the reading and problem ets eaching Pedagogy : Descriptive eaching Aids : PowerPoint & Black board

genetic code

Curricular : Assignment xtra-curricular : Do the reading and problem ets eaching Pedagogy : Descriptive eaching Aids : PowerPoint & Black board

rotein synthesis

Curricular : Assignment xtra-cun•icular : Do the reading and problem ets

2+


2

Unit-5 Title	Topics	No. of Hours
	Estimation of DNA by diphenylamine(DPA) method	

	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,Hours	No. of
ol' genes	reaching Pedagogy : Descriptive Caching Aids : PowerPoint & Black board Curricular : Group discussion Extra-curricular : Interactive session Caching Pedagogy : Descriptive	3
operon concept, Lac operon	Caching Aids : PowerPoint & Black board Curricular : Assignment and group discussion Extra-curricular Review lecture notes and •x lainin ' other o cron s stems reaching Pedagogy : Descriptive reaching Aids : PowerPoint & Black board	
Basic Principles of genetic engineering	Curricular : MCC); and Assignment Extra-curricular : Prepare an outline of issues to cover in class Caching Pedagogy : Descriptive	
Outlines of gene cloning genomic and cDNA libraries	Caching Aids : PowerPoint & Black board Curricular : Practical and Group Discussion Extra-curricular : Interactive session Caching Pedagogy : Descriptive Caching Aids : PowerPoint & Black board	19
Applications of Genetic Engineering	Curricular : Group Discussion Extra-curricular: Interactive session	



	stimulation of RNA by orcinol method	
	Study of cell division in onion root tip(mitotic division)	
	Isolation of DNA from bacteria	
	Isolation of mutants of bacteria by UV exposure	
	Problems related to Mendilian laws mono and dihybrid cross(problems)	
	Problems related to gene interactions	
	Problems related to DNA and RNA characteristics,transcription and Translation	
		Total Hours : <b>80</b>



**TELANGANA SOCIAL WELFARE RESIDENTIAL DEGREE COLLEGES**

Name of the College TSWRDC Mancherial

**SEMESTER PLAN**

Dept. of Microbiology  
 TSWRDC (W), Mancherial

Names of the Course	<b>B.Sc. MZC III YEAR SEMESTER – v</b>
Subject	MICROBIOLOGY
Paper Name	INDUSTRIAL AND FOOD MICROBIOLOGY
Paper Code	
Learning Outcomes	<p>Upon successful completion, students will be able to :</p> <p>Understands the Bio reactors, and their functioning</p> <p>Understands the history and development in Industrial microbiology</p> <p>Understands the types of fermentations</p> <p>Understand the isolation of industrial strains and fermentation medium</p> <p>Preservation and maintainance of industrial strains</p> <p>Understands the ingredients used in Fermentation medium</p> <p>Understand the down stream processing and its importance</p> <p>Understands the different Types of industrial products</p> <p>Intrinsic and extrinsic parameters that affects the microbial growth in food.</p> <p>Understands the different types of food preservation techniques</p> <p>Importance of probiotics and examples.</p>
Faculty Name	<b>K.SHIVALEELA</b>

Unit-1 Title	TOPICS	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities, etc.,	No. of Hours
	Introduction to industrial microbiology, brief history and developments in industrial microbiology	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment Extra-curricular : Questionnaire	5
	<b>Types of Fermentation processes: Solid state , liquid state, batch , fed batch and continuous</b>	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment Extra-curricular : Group Discussion	5
	Types of fermenters – laboratory, pilot-scale and production fermenters. Components of a typical continuously stirred tank bioreactor	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples, practicals Extra-curricular : Group Discussion	5

Unit-2Title	Curricular, Teaching Extra-curricular Pedagogy, Teaching Activities Aids,etc.,	HoursNo. or
Topics		
solation of industrial strains and fermentation medium: Primary and eaching Pedagogy : Instructive and descriptive		
econdary eaching Aids : PowerPoint & Black board		
urricular : Assignment and MCQs		
5		
screening. Preservation and maintenance Extra-curricular : More written exams to be		
f industrial strains.	cheduled by instructor at various points	
hroughout the course		
.Ingredients used in fermentation Instructive and descriptive eaching Pedagogy :		
edium - molasses, corn steep liquor,eaching Aids : PowerPoint & Black board		
'hey &yeast	Curricular : Assignment, MCQs and Practicals	5
Extra-curricular : More written exams to be		
xtract.	at various points	
scheduled by instructor		
hroughout the course		
.Microbial fermentation processes: Instructive and descriptive eaching Pedagogy :		
ownstream processing - filtration,eaching Aids : PowerPoint & Black board		
entrifugation,	Curricular : Assignment and MCQs	5
xtra-curricular : More written exams to be		
ell disruption, solvent extraction.scheduled by instructor at various points		
hroughout the course		

Unit-3 Title	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
. Microbial production of industrial products - citric acid, ethanol and penicillin.		Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Assignment Extra-curricular : Make a handout of topics to discuss in class	5
Food as a substrate for microbial growth: Intrinsic and extrinsic parameters that affect microbial growth in food.		Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Assignment and Group discussion Extra-curricular : Make a handout of topics to discuss in class	5
Microbial spoilage of food - milk, egg, bread and canned foods.		Teaching Pedagogy : Descriptive teaching Aids : PowerPoint & Black board Curricular : Group discussion and MCQ's Extra-curricular : Make a handout of topics to discuss in class	5

Unit-4 Title	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
	Principles and methods of food preservation and food sanitation: Physical methods -  high temperature, low temperature, irradiation, aseptic packaging. Chemical methods  - salt, sugar, benzoates, citric acid, ethylene oxide, nitrate and nitrite.	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : Group discussion Extra-curricular : Interactive session	5
	Dairy products, probiotics and Food-borne Diseases: Fermented dairy products  yogurt, acidophilus milk, kefir, dahi and cheese.	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : Assignment and group discussion Extra-curricular : Make a handout of topics to discuss in class	5
	t.Probiotics definition, examples and benefits.	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : MCQs and Assignment Extra-curricular : Prepare an outline of issues to cover in class	5

Unit-5 Title	Topics	No. of Hours
	Microbial fermentation for the production and estimation of amylase.	4
	Microbial fermentation for the production and estimation of citric acid.	4
	Microbial fermentation for the production and estimation of ethanol.	4
	Determination of the microbiological quality of milk sample by MBRT.	4
	Isolation of fungi from spoilt bread/fruits/vegetables.	4
	Preparation of yogurt.	4
<b>Total Hours :</b>		<b>84</b>

*K. P. Teel*

Dept. of Microbiology  
SWRDC (M), Mancheri

*Surya*  
PRINCIPAL  
MANCHERIAL  
SWRDC (M)



# TELANGANA SOCIAL WELFARE RESIDENTIAL DEGREE COLLEGES

Name of the College TSWRDC Mancherial  
Names of the Faculty Name SEMESTER PLAN  
Course  
Subject B.Sc. MZC 11 YEAR  
SEMESTER JCROBIOLOCJY  
Paper Name NVIRONMENTAL MICROBIOOGY  
Paper Code

## Learning Outcomes

Upon successful completion, students will be able to :  
Understands the Bioaerosols, and air borne microorganisms

Understands the impact of air borne microorganisms on human health and environment.

Understands the significance of air borne microorganisms in food and pharmaceutical industries and operation theatres, allergens.

Understand the air sample collection, analysis of the microorganism through CFI-J identifies the culture media for bacteria and fungi inactivation of bioaerosols through different mechanisms like V, HEPA filters, desiccation etc. Understands the different water borne pathogen and the type of diseases caused by them.

Understand how to collect water sample, treatment of water purification. Understand the different methods to detect potability of water samples. Standard qualitative procedure:

Presumptive test (1VfPN test), confirmed and completed tests for faecal coliforms. Control measures: Precipitation, chemical disinfection, filtration, high temperature, UV light

.SHIVALEELA

Dept. of Microbiology  
(W), Mancherial



Unit-1 Title	TOPICS	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities, etc.,	No. of Hours
	Aero microbiology: Bioaerosols, Air borne microorganisms (bacteria, Viruses, fungi)	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment Extra-curricular : Questionnaire	5
	Impact of air borne microorganisms on human health and environment.	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment Extra-curricular : Group Discussion	5
	Significance of air borne microorganisms in food and pharma industries and operation theatres, allergens.	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Blackboard Curricular : Assignment with examples, practicals Extra-curricular : Group Discussion	5

二猷、さな、CFC

它::こを 0:: 0 0 こ:ざ 0

o.こ:0「トき::まニミこつ、..一、

3

00 ござを二に=:ドニま 0: 0 ござぐミミミ、

1 ぐ 00 トいまミいーま、T ぐまバト iii&人いき、

Cを口、第い広を、:「バ第「一\*第「人i、ii 0”  
0い

貰、ぐトこいぐ 3 ござ員 0、れ、:i、バこ

03 des ぐれバ貰ぐ当 0 人に、バ震&

に震発い::人iこ豊 1 ぐこ ad、ICバ

ドこトト、トト:れ:0「隼、口 0 い)iii いこ:こ

ト 0 震:トぐバ0 にさバ

T ぐこ 第こいぐ 3 ござ 0: It、:ユ:i、バ工 desバ i、バ 1 ぐ

三豊こ A にトい 0、:=ド Bl.Rk、ユ 03

に三:=:人沁ユぐ 0、- CQ こ:ごiバミ Is 人・こ・バ

:::ミこ:こ:、!0:バ、気::00 0、こ 1:0 い

に三:こ::こトこ::ト 0 ざこ 0

バ三二。~ここ 0:き:隼こi、バand descripti、バ淋こ

:~0、バ心&-Black、ユ 03 一、に三ござ:人い隼 0

3、::t こ、::=:に、い、気バ豊 ex 1、いと 0

0,

Unit- Title	Topics	Teaching methodology, Teaching Aids, Curricular, Extra-curricular Activities etc.,	Hours
	Water Microbiology: Water borne Pathogens.	Teaching, Pedagogy : Descriptive Teaching! Aids : PowerPoint & Black board Curricular : Assignment Extra-curricular : Make a handout of topic, to discuss in class	
	Water borne diseases.	Teaching, Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : Assignment and Group discussion Extra-curricular : Make a handout of topic, to discuss in class	
	Microbiological analysis of water: Sample collection. Treatment and safety of drinking (potable) water	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : Group discussion and MCQ's Extra-curricular : Make a handout of topics to discuss in class	

Unit-4 Title	Topics	Teaching Pedagogy, Teaching Aids, Curricular, Extra-curricular Activities etc.,	No. of Hours
	Methods to detect potability of water samples: Standard qualitative procedure; presumptive test(MPN test), confirmed and completed tests for faecal coliforms	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : Group discussion Extra-curricular : Interactive session	5
	Membrane filter technique and Presence/absence tests.	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : Assignment and group discussion Extra-curricular : Make a handout of topics to discuss in class	5
	Control measures: Precipitation, chemical disinfection, filtration, high temperature, UV light.	Teaching Pedagogy : Descriptive Teaching Aids : PowerPoint & Black board Curricular : MCQs and Assignment Extra-curricular : Prepare an outline of issues to cover in class	5

Unit-5 Title	Topics	No. of Hours
	1. Determination of Biochemical Oxygen Demand (BOD) of sewage water	3
	2. Determination of Chemical Oxygen Demand (COD) of industrial waste water	3
	3. Bacteriological examination of water using multiple tube fermentation test: presumptive test, confirmed test and completed coli form test	3
	4. Analysis of Air Microflora	3
<b>Total Hours :</b>		89

K. Sule

Dept. of Microbiology  
SWRDC (W), Mancherial

Surya  
PRINCIPAL  
TSWRDC (W)  
MANCHERIAL