

MVN University

Scheme of Studies

Course: B.Sc. Bio Technology, Batch: 2020-21

Academic Year 2020-21 (NOV-2020) Semester I

S. No.	Subject Code	Subject Title	Contact Hours per Week			Credits
			L	T	P	
1.	HBL-101-20	Fundamentals of Microbiology-1	3	0	0	3
2.	HBL-103-20	Introduction to Biotechnology-1	3	0	0	3
3.	HBL-105-20	Biochemistry - 1	3	0	0	3
4.	ABL-107-20	Cell Biology-1	3	0	0	3
5.	SDP-101-20	Work Place competencies-I	0	0	2	1
6.	HBP-101-20	Fundamentals of Microbiology-1 Lab	0	0	4	2
7.	HBP-103-20	Introduction to Biotechnology-1 Lab	0	0	4	2
8.	HBP-105-20	Biochemistry - 1 Lab	0	0	4	2
9.	HBP-107-20	Cell Biology-1Lab	0	0	4	2
Total			12	0	18	21

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Academic Year 2020-21 (NOV-2020) Semester II

S. No.	Subject Code	Subject Title	Contact Hours per Week			Credits
			L	T	P	
1.	HBL-102-20	Fundamentals of Microbiology-2	3	0	0	3
2.	HBL-104-20	Introduction to Biotechnology-2	3	0	0	3
3.	HBL-106-20	Biochemistry - 2	3	0	0	3
4.	ABL-108-20	Cell Biology-2	3	0	0	3
5.	SDP-102-20	Work Place competencies-II	0	0	2	1
6.	HBP-102-20	Fundamentals of Microbiology-2 Lab	0	0	4	2
7.	HBP-104-20	Introduction to Biotechnology-2 Lab	0	0	4	2
8.	HBP-106-20	Biochemistry - 2 Lab	0	0	4	2
9.	HBP-108-20	Cell Biology-2Lab	0	0	4	2
Total			12	0	18	21



MVN University**Scheme of Studies****Course: B.Sc. Bio Technology, Batch: 2020-21****Academic Year 2020-21 (NOV-2020) Semester III**

S. No.	Subject Code	Subject Title	Contact Hours per Week			Credits
			L	T	P	
1.	HBL-201-20	Clinical & Applied Microbiology-1	3	0	0	3
2.	HBL-203-20	Introduction to Biotechnology-3	3	0	0	3
3.	HBL-205-20	Biochemistry - 3	3	0	0	3
4.	ABL-207-20	Introduction to computer application	3	0	0	3
5.	SDP-201-20	Work Place competencies-II	0	0	2	1
6.	HBP-201-20	Clinical & Applied Microbiology-1Lab	0	0	4	2
7.	HBP-203-20	Introduction to Biotechnology-3 Lab	0	0	4	2
8.	HBP-205-20	Biochemistry - 3 Lab	0	0	4	2
9.	HBP-207-20	Introduction to computer application Lab	0	0	2	1
Total			12	0	16	20



MVN University**Scheme of Studies****Course: B.Sc. Bio Technology, Batch: 2020-21****Academic Year 2020-21 (NOV-2020) Semester IV**

S. No.	Subject Code	Subject Title	Contact Hours per Week			Credits
			L	T	P	
1.	HBL-202-20	Clinical & Applied Microbiology-2	3	0	0	3
2.	HBL-204-20	Introduction to Biotechnology-4	3	0	0	3
3.	HBL-206-20	Biochemistry - 4	3	0	0	3
4.	ABL-208-20	Introduction to C-Programming & Digital Logic	3	0	0	3
5.	SDP-202-20	Work Place competencies-II	0	0	2	1
6.	HBP-202-20	Clinical & Applied Microbiology-2Lab	0	0	4	2
7.	HBP-204-20	Introduction to Biotechnology-34 Lab	0	0	4	2
8.	HBP-206-20	Biochemistry - 4 Lab	0	0	4	2
9.	HBP-208-20	Introduction to C-Programming & Digital Logic Lab	0	0	2	1
Total			12	0	16	20



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Academic Year 2020-21 (NOV-2020) Semester V

S. No.	Subject Code	Subject Title	Contact Hours per Week			Credits
			L	T	P	
1.	HBL-301-20	Medical Microbiology-1	3	0	0	3
2.	HBL-303-20	Introduction to Biotechnology-5	3	0	0	3
3.	IIDL-305-20	Biochemistry 5	3	0	0	3
4.	ABL 307 20	Introduction to Data Structure & Computer Organization	3	0	0	3
5.	SDP-301-20	Work Place competencies-II	0	0	2	1
6.	HBP-301-20	Medical Microbiology-2 Lab	0	0	4	2
7.	HBP-303-20	Introduction to Biotechnology-5 Lab	0	0	4	2
8.	HBP-305-20	Biochemistry - 5 Lab	0	0	4	2
9.	HBP-307-20	Introduction to Data Structure & Computer Organization Lab	0	0	2	1
Total			12	0	16	20

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Course: B.Sc. Bio Technology, Batch: 2020-21

Academic Year 2020-21 (NOV-2020) Semester VI

S. No.	Subject Code	Subject Title	Contact Hours per Week			Credits
			L	T	P	
1.	HBL-302-20	Medical Microbiology-2	3	0	0	3
2.	HBL-304-20	Introduction to Biotechnology-6	3	0	0	3
3.	HBL-306-20	Biotechnology-7	3	0	0	3
4.	ABL-308-20	Biotechnology-8	3	0	0	3
5.	SDP-302-20	Work Place competencies-II	0	0	2	1
6.	HBP-302-20	Medical Microbiology-2 Lab	0	0	4	2
7.	HBP-304-20	Introduction to Biotechnology-6 Lab	0	0	4	2
8.	HBP-306-20	Biotechnology-7 Lab	0	0	4	2
9.	HBP-308-20	Biotechnology-8 Lab	0	0	4	2
Total			12	0	18	21

HBL-101-21	Fundamentals of Microbiology	L	T	P	CRED-IT
		3	0	0	3

Objective: *The objective of the course is to provide fundamental knowledge of Microbiology. It covers classification, structure, growth and identification of microbes.*

SECTION – A

UNIT -1

L-7

Introduction to Microbiology- Classification of Microbes, pathogen, commensals, type of Infections, communicable diseases, Carriers Historical aspects in Microbiology. Contributions of Antony Van Leeuwenhoek, Louis Pasteur, Robert Koch and Paul Ehrlich.

UNIT- 2

L-7

Structure and classification of bacteria- Difference between prokaryotes and eukaryotes. Structure- Cell wall, flagella, fimbriae, capsule, spore, plasmid. Classification of bacteria based on morphology Arrangement, Motility and oxygen requirement

UNIT- 3

L-7

Sterilization and disinfection- Importance of sterilization and Disinfection Methods of sterilization Physical methods- Dry heat, Moist Heat Chemical methods- alcohols, aldehydes, gases Mechanical methods- Filtration, Radiation. Describe principle, parts, and use of - Hot air Oven, Autoclave. Disinfectants and Antiseptics and their application

SECTION – B

UNIT -4

L-7

Growth & Cultivation of Bacteria- Bacterial growth and replication - Mention essential growth requirements- Temperature, PH, Gaseous requirements

UNIT -5

L-6

Culture media techniques- Classification of culture media with examples Preparation and use of common media Peptone water, Nutrient Agar, Blood Agar, Chocolate agar, Mac Conkey Agar Bacteriological wire loop, Straight wire - Inoculation of Culture media- Liquid and Solid

Mention Streak, Stroke, Stab, Lawn culture - Mention Anaerobic techniques- Gas pak.

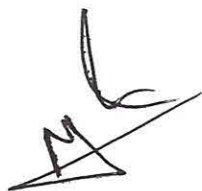
Techniques and identification- Basic identification Techniques Introduction Identification of bacteria .Different methods.Detection of motility - Name different methods - Hanging drop method in detail.Staining - Principle, requirement, procedure and interpretation of Simple stain, Grams stain, AFB stain

Text Books:

1. Textbook of microbiology, ananthanarayan and paniker's
2. Textbook of microbiology, C. P. BAVEJA
3. The Short Textbook of Medical Microbiology Including Parasitology: Including Parasiotology, Satish Gupte

Reference Books:

1. Prescott's Microbiology - McGraw-Hill Education
2. Pelczar Microbiology - McGraw-Hill Education

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HBL-103-21	INTRODUCTION TO BIOTECHNOLOGY	L	T	P	CREDIT
		3	0	0	3

Unit I Introduction to Biotechnology : History & Introduction to Biotechnology What is Biotechnology. Definition of Biotechnology, Traditional and Modern Biotechnology, Branches of Biotechnology

Unit II Scope of Biotechnology : Biotechnology Research in India. Biotechnology Institutions in India (Public and Private Sector) Biotech Success Stories Biotech Policy Initiatives Biotechnology in context of Developing World Public Perception of Biotechnology

Unit III Applications Biotechnology: Applications of Biotechnology in Agriculture . GM Food, GM Papaya, GM Tomato, Fungal and Insect Resistant Plants BT Crops, BT Cotton and BT Brinjal Pros and Cons Biotechnological applications in Crop and Livestock Improvements Modifications in Plant Quality Golden Rice, Molecular Pharming, Plant Based Vaccines Ethics in Biotechnology and IPR

Unit IV Food Biotechnology: Food Biotechnology Biotechnological applications in enhancement of Food Quality Unit Operation in Food Processing Quality Factors in Preprocessed Food Food Deterioration and its Control

Unit V Industrial Biotechnology : Industrial Fermenters, Single-cell Protein. Biomining and bioleaching of ores (Use of thermophilic microorganisms in industrial microbiology Bio-gas, Bio-leaching, Bio-diesel

Unit VI Fermentation Biotechnology: Fermentation Technology Definition, Applications of Fermentation Technology Microbial Fermentations Overview of Industrial Production of Chemicals (Acetic Acid, Citric Acid and Ethanol), Antibiotics, Enzymes and Beverages.

HBL-105-21	BIOCHEMISTRY - I	L	T	P	CREDIT
		3	0	0	3

Objective: This syllabus has been formulated to impart basics knowledge of biochemistry, apparatus, units, equipment, and volumetric analysis in the Clinical Biochemistry.

UNIT-1

Introduction- Introduction to Clinical Biochemistry and role of Medical Lab Technologist, ethics, responsibility, safety measure and hazards in clinical biochemistry lab and first aid in laboratory accidents.

UNIT-2

Laboratory awareness- Basic awareness of laboratory in respect to equipment's and glassware's. Calibration of volumetric apparatus, cleaning & care and maintenance.

UNIT-3

laboratory equipment's- Principle, working, care & maintenance and calibration of Weighing balance, Hotplate, Magnetic stirrer, Centrifuges, Incubator, Hot air oven, Colorimeter, Spectrophotometer, Water distillation plant, Deionizers, pH paper, pH meter, method of pH measurement.

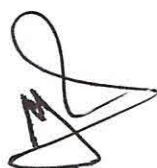
UNIT-4

Reagents and solution- Preparation and storage of reagent, standard solution, buffer solutions and their pH determination.

UNIT-5

Body fluids- Biophysical techniques- osmosis, dialysis, surface tension, sedimentation and viscosity. Biochemical composition of body fluids and their physiological variations. Collection of blood specimens avoiding Haemolysis and separation of serum and plasma.

UNIT-6



Clinical Biochemistry- Physical and biochemical examination of urine samples: Qualitative tests of inorganic urinary ingredients: Chlorides, phosphate, sulphur compounds, sodium, potassium, calcium and magnesium and their clinical significance.

Text Book:

1. D M Vasudevan, (2011),Text book of Medical Biochemistry,6th edition Jaypee Publishers.

Reference Books:

1. M N Chatterjea & Rana Shinde,(2012),Text book of Medical Biochemistry,8th edition,Jaypee Publications.
2. U Satyanarayan, (2008), Essentials of Biochemistry, 2nd edition, Standard Publishers.

Text Book:

3. D M Vasudevan, (2011),Text book of Medical Biochemistry,6th edition Jaypee Publishers.
4. J L Jain (2016) fundamentals of biochemistry S chand.

Reference Books:

1. M N Chatterjea & Rana Shinde,(2012),Text book of Medical Biochemistry,8th edition,Jaypee Publications.
5. U Satyanarayan, (2008), Essentials of Biochemistry, 2nd edition, Standard Publishers.



HBL-107-21	Cell Biology	L	T	P	CREDIT
		3	0	0	3

Objective: *This course has been formulated to impart comprehensive knowledge of cell and structure and functions of cell organelles.*

Unit I

Overview of Cell : Overview of prokaryotic and eukaryotic cells, cell size and shape, Phages, Virioids, Mycoplasma and Escherichia coli. Chemical composition and molecular interactions, chemical building blocks of cells.

Unit II

The Nucleus - Nuclear Envelope- structure of nuclear pore complex, nuclear lamina, Transport across Nuclear Envelope, Chromatin: molecular organization.

Unit III

The Plasma Membrane – Structure, Transport of small molecules, Endocytosis. Cell Wall, the Extracellular Matrix and Cell Interactions - Bacterial and Eukaryotic Cell Wall; the extracellular matrix and cell matrix interactions; cell-cell interactions.

Unit IV

Mitochondria - Structural organization, Function, Enzymes, Mitochondrial biogenesis, Protein import in mitochondria and Energy production through ETC.

Unit V

Protein synthesis, sorting and transport – The Ribosome, The Endoplasmic reticulum, The Golgi Apparatus, Mechanism of Vesicular Transport, and Lysosomes.

Unit VI



Cytoskelton and Cell Movement - Structure and organization of actin filaments, actin, myosin and cell movement; intermediate filaments; microtubules.

Text Books:

1. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, Dr. P. S. Verma, Dr. V. K. Agarwal
2. Cell and Molecular Biology: Concepts and Experiments VI edition, Karp, G

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SDP 101-19	Workplace Competencies -I	L	T	P	Cr
		0	0	2	1

Total hrs. - 25

Objective:-

The objective of the module is to make students aware about different aspects of Communication. It covers the various aspects of communication such as barriers in communication, Listening Skills and how to express surroundings, actions and happenings with the help of ready to use sentence structures of English Language.

(Section - A)

1. Communication Skills

To make the students aware about

- The importance of good communication
- The way to develop good communication skills
- Consequences of miscommunication
- Difference between speaking and communication
- Different types of communication
- That the ultimate aim of communication is being understood

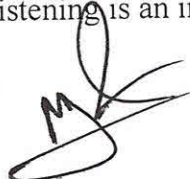
2. How to Avoid Confusion

- Introduce to the students the meaning of perception and other barriers to communication.
- Also, throw light on the fact that how our perceptions hinder the process of communication and how we can overcome them.
- We have to explain as to why we form perceptions and then look at things with a limited perspective.
- We thus block our minds and our thoughts or imagination; think only what we feel is right and refrain from seeing the other's point of view and thus we need to change.

3. How to be a Good Listener

To make the students:-

- Aware that listening is an important part of communication.



- Understand the importance of good listening skills.
- Aware about the various levels of listening.
- Able to overcome the barriers to listening.
- Able to listen empathically.

(Section - B)

4. Interaction with Your Surroundings

After this session students will be

- Able to use the sentence structures formed with is/am/are/was/were and has/have/had.
- Able to describe your surroundings in both in past and present form.
- Able to describe your possession both in past and present form.
- Equipped with the most commonly used 100 nouns and a list of adjectives.
- Equipped with the Conversational English for General Greetings, Asking Locations and Introducing Friends.

5. How to Express Actions/ Happenings in day to day Life

This session will make students able to

- Able to use sentence structures to describe actions in present, past and future form.
- Able to describe actions in English
- Able to use modal verbs related to Request, Asking Permission, Suggestions, and Imagination etc.
- Equipped with the various conversations in day to day life.

Evaluation Scheme

Workplace competencies -1 will be evaluated under continuous classroom evaluation as per following structure

<i>Course</i>	Evaluation Scheme			
	<i>Attendance</i>	<i>Test 1</i>	<i>Test 2</i>	<i>Total</i>
Workplace Competencies-1	20	40	40	100

Text Books:

1. English Grammar in Use for Intermediate Students - Raymond Murphy

Reference Books:

1. How English Works: A Grammar Practice Book - Michael Swan
2. Practical English Usage by Michael Swan




3. A Communicative Grammar of English - Geoffrey N. Leech

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HBP-101-21	Fundamentals of Microbiology	L	T	P	CREDIT
		0	0	3	2

Practical Microbiology

1. To study precaution to be taken in microbiology laboratory.
2. To study instruments/Glassware's and tools of microbiology lab.
3. To study parts of microscope. and focusing.
4. Methods of sterilization.
5. Simple and Gram's staining of bacteria.
6. AFB (ZN) staining of sputum sample.
7. Study nutritional media and their preparations.
8. Preparation of special culture media.
9. Pour and spread plate method for the isolation of bacteria.
10. Types of streaking to isolate the bacteria.



HBP-103-21	INTRODUCTION TO BIOTECHNOLOGY	L	T	P	CREDIT
		0	0	3	2

Practical Haematology

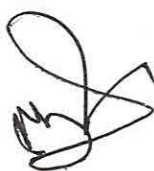
1. Study of any branch of biotechnology and its applications
2. Microbial examination of food and detection of Pathogenic Bacteria from Food Samples
3. Isolation of organisms causing Food Spoilage
4. Microscopic determination of Microbial flora from Yoghurt and Lactic Acid Determination
5. Analysis of Milk Methylene Blue, Resazurin Test, Phosphatase Test
6. Extraction of Caesin from Milk
7. Meat Tenderization using Papain
8. Fermentative production of Alcohol
9. Determination of Alcohol content
10. Isolation and purification of DNA (genomic, plasmid) ,Restriction Digestion



HBP-105-21	BIOCHEMISTRY - I	L	T	P	CREDIT
		0	0	3	2

Practical Clinical biochemistry

1. To study general laboratory safety rules.
2. To demonstrate glassware, apparatus and plasticwares used in laboratory.
3. Collection of blood sample.
4. To separate serum and plasma.
5. Preparation of different percentage solutions.
6. Preparation of normal and molar solutions. (0.1 N NaOH, 0.2N HCl, 0.1 M H₂SO₄).
7. Demonstration of photocolormeter and spectrophotometer.
8. Demonstration of pH meter.
9. Deproteinization of blood sample.
10. Physical and biochemical examination of urine samples



HBP-107-21	Cell Biology	L	T	P	CRED IT
		0	0	4	2

List of Experiments:

1. Demonstration of Prokaryotic cell.
2. Demonstration of eukaryotic cell.
3. Demonstration of Nucleus.
4. Demonstration of Mitochondria.
5. Demonstration of Cell wall & plasma membrane.
6. Demonstration of Endoplasmic reticulum.
7. Demonstration of Golgi bodies.
8. Demonstration of Ribosome.
9. Demonstration of Lysosome.
10. Demonstration of cytoskeleton.