

## B.Sc., Microbiology

### Program Outcomes:

<u>S.No</u>	<u>OUTCOMES</u>
<b>PO1</b>	The course will help them to impart the knowledge of the basic principles of microbiology, bacteriology, mycology, immunology, virology and algal technology including the nature of pathogenic microorganisms, pathogenesis, laboratory diagnosis, transmission, prevention and control of diseases common in the country.
<b>PO2</b>	Students will demonstrate competency in laboratory safety and in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including accurately reporting observations and analysis. Students will demonstrate engagement in the Microbiology discipline through involvement in research or internship activities.
<b>PO3</b>	Also it understand the relationship between the science and society by recognizing and discussing logical, scientific and ethical issues in Microbiology.
<b>PO4</b>	This program outcomes will help the students to learn the theoretical and practical view of the syllabus. It will help them to understand the courses fundamentally and its outcomes to develop their subject skills
<b>PO5</b>	Communicate and collaborate with other disciplines by effectively communicating the fundamental concepts of Microbiology in written and oral format. Identify credible scientific sources to interpret and evaluate the evidences.
<b>PO6</b>	The course is reasoning and application based, making the students eligible for higher studies, jobs in various sectors and Entrepreneurship abilities.
<b>PO7</b>	Analyze and interpret results from a variety of microbiological methods
<b>PO8</b>	Understand the issues of environmental contexts and sustainable development.
<b>PO9</b>	Understand the relationship between science and society by recognizing and discussing logical, scientific and ethical issues in microbiology.
<b>PO10</b>	Get ability to apply the process of science by formulating hypotheses and design experiments based on the scientific method

**Program specific Outcomes:**

<b><u>S.No</u></b>	<b><u>OUTCOMES</u></b>
<b>PSO1</b>	A general course emphasizing distribution, morphology and physiology of microorganisms in addition to skills in aseptic procedures, isolation and identification of microorganism from plant, animal, food, water, soil and human.
<b>PSO2</b>	On successful completion of graduation for UG and PG students will gain insight of Microbiology starting from history, basic laboratory techniques and fundamental knowledge about the microorganisms.
<b>PSO3</b>	The skill enhancement elective course such as algal technology, mushroom cultivation and herbal technology to develop their knowledge.
<b>PSO4</b>	They will be well-informative about the integral role of microorganisms associated with specific disease, vital role of microorganisms in biotechnology, fermentation, medicine, and other industries important to human well being.
<b>PSO5</b>	It will acquire the skill in the use and care of basic microbiological equipment; performance of basic laboratory procedures in microbiology; proper collection and forwarding of microbiological and medical.
<b>PSO6</b>	Estimate the number of microorganisms in a sample by suitable enumeration technique
<b>PSO7</b>	Use appropriate microbiological and molecular lab equipment and methods.
<b>PSO8</b>	Practice safe microbiology, using appropriate protective, biosafety and emergency procedures.
<b>PSO9</b>	Use pure culture and selective techniques to isolate microorganisms. Identify microorganisms (media-based, molecular and serological).
<b>PSO10</b>	Document and report on experimental protocols, results and conclusions.

**SEMESTER-I**

**PAPER- 1**

**FUNDAMENTALS OF MICROBIOLOGY**

**SUBJECT CODE: UMB11**  
**NO.OF.HOURS/ WEEK: 06**

**CREDITS:05**  
**TOTAL HOURS:77**

**Course Outcomes**

<b>Semester</b>	<b>Course Name</b>	<b>Course Credit</b>	<b>Course Outcomes</b>
I Regulation 2017- 2018) Semester-I	Fundamentals of Microbiology	04	CO1-Students will learn about the Definition and scope of Microbiology-History of Microbiology
			CO2- Students will be able to understand the working of Microscopy and Staining methods and its principles
			CO3- The Students will learn the Microbial Evolution and Diversity and Binomial nomenclature of Microbes.
			CO4- Students will be able to understand the Anatomy of prokaryotes
			CO5- student will learn basic concepts of Sterilization and Antimicrobial chemotherapy

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	M	S	S	M	S	M	S
CO2	M	S	M	S	S	S	M	S	S	M
CO3	S	M	S	M	S	S	S	S	S	S
CO4	S	S	S	S	M	M	M	M	M	M
CO5	S	S	M	S	M	S	S	M	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

Environmental Studies

**SUBJECT CODE: UES10**  
**NO.OF.HOURS/ WEEK: 02**

**CREDITS: 02**  
**TOTAL HOURS:24**

**Course Outcomes**

Semester	Course Name	Course Credit	Course Outcomes
I  (Regulation 2017- 2018) Semester-I	Environmental Studies	02	CO1-Students will learn about the DefinitionandscopeofMicrobiology-HistoryofMicrobiology
			CO2- Students will able to understand the working of Microscopy and Stainingmethodsanditsprinciples
			CO3- The Students will learn the MicrobialEvolutionandDiversity and BinomialnomenclatureofMicrobes.
			CO4- Students will able to understand the Anatomy of prokaryotes
			CO5- student will learn basic concepts of Sterilization and Antimicrobialchemotherapy

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	M	S	M	S	M	M	M
CO2	S	S	S	M	S	M	S	M	M	M
CO3	S	M	S	M	S	M	S	M	M	M
CO4	S	M	S	M	S	M	S	M	M	M
CO5	S	M	S	L	S	M	S	M	L	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SEMESTER-II**

**SUBJECT NAME: MICROBIAL PHYSIOLOGY**

**SUBJECT CODE: UMB21**

**NO.OF.HOURS/ WEEK: 06**

**CREDITS: 05**

**TOTAL HOURS: 77**

Semes ter	Course Name	Course Credit	Course Outcomes
II Regul ation (2017- 18)	MICROBIALP HYSIOLOGY	05	CO1- Students to understand the Basicconceptsofmetabolism and Transportofnutrients.
			CO2- The Students will able to learn the modern methods of Cultivation of microbes, Culture techniques and Pure Culture Techniques.
			CO3- The Students will Study about the Microbial growth and Factorsaffectinggrowth.
			CO4- The Students will learn and understood the Controlofmicrobialgrowth
			CO5- Students will learning the Basicconceptsofmetabolism and Bacterial enzyme.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	M	S	S	M	S	M	S
CO2	M	S	M	S	S	S	M	S	S	M
CO3	S	M	S	M	S	S	S	S	S	S
CO4	S	S	S	S	M	M	M	M	M	M
CO5	S	S	M	S	S	M	S	M	M	S

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME:**Subjects covering Core Papers 1 & 2 practical 1

**SUBJECT CODE:** UPMB22

**CREDITS:** 03

**NO.OF.HOURS/ WEEK:** 3

**TOTAL HOURS:** 39

**Course Outcomes**

Semester	Course Name	Course Credit	Course Outcomes
II Regulation (2017-18)	Subjects covering Core Papers 1 & 2 Practical-1	03	CO1 - Get acquainted with various sterilization techniques.
			CO2- Students able to know the various culture media and their application.
			CO3- students will able to perform Cultural characteristics of microorganisms.
			CO4- students will able to Prepare and view specimens using microscopy.
			CO5- students will get the idea about Hanging drop preparation.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	S	S	S	M	S	M	S
CO2	M	S	M	S	M	S	S	S	S	S
CO3	S	M	S	S	M	S	S	S	S	M
CO4	S	S	M	S	S	S	M	M	S	M
CO5	S	S	M	S	M	S	S	S	S	S

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

## SEMESTER-3

**SUBJECT NAME: IMMUNOLOGY**

**SUBJECT CODE: UMB31**

**CREDITS: 03**

**NO.OF.HOURS/ WEEK: 03**

**TOTAL HOURS: 39**

### Course Outcomes

Semester	Course Name	Course Credit	Course Outcomes
II Regulation (2017-18)	IMMUNOLOGY	03	CO1- The Students will able to learn the HistoryofImmunology, Blood groups and Microbial Infections.
			CO2- Students will able to understood the Structure and function of Immune system.
			CO3- The Students will able to understand the Antigen, Immunoglobulin and Theoryofantibodyproduction.
			CO4- Students will able to learn Vaccines and Immunization, Hybridoma Technology and Cell mediated immune response
			CO5- To understand the ConceptofAntigen-antibodyinteraction.

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	M	S	M	S	M	S
CO2	M	S	M	S	M	S	M	S	S	M
CO3	S	M	S	M	S	S	S	S	S	S
CO4	S	S	S	S	M	S	M	M	S	M
CO5	S	S	M	S	M	S	S	M	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**



**SUBJECT NAME:** Human anatomy and physiology

**SUBJECT CODE:**

**CREDITS: 04**

**NO.OF.HOURS/ WEEK: 04**

**TOTAL HOURS: 45**

**Course Outcomes**

<b>Semester</b>	<b>Course Name</b>	<b>Course Credit</b>	<b>Course Outcomes</b>
<b>II Regulation (2017-18)</b>	Human anatomy and physiology	04	CO1- Students will be able to understand the Respiratory System and Special Sensory Organs
			CO2- Students will be able to learn Methods of Gastro Intestinal system
			CO3- The Students will be able to understand the Musculoskeletal System, Skin and Nervous System
			CO4- Students will be able to learn Circulatory System and Endocrine System
			CO5- To understand the Reproductive System and Urinary System.

<b>Cos</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>M</b>	<b>S</b>	<b>S</b>	<b>M</b>	<b>S</b>	<b>M</b>	<b>L</b>
<b>CO2</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>M</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>M</b>
<b>CO3</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>M</b>	<b>M</b>	<b>S</b>
<b>CO4</b>	<b>S</b>	<b>M</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>M</b>	<b>S</b>	<b>M</b>
<b>CO5</b>	<b>M</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>M</b>	<b>S</b>	<b>L</b>	<b>S</b>	<b>L</b>	<b>S</b>

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

## SEMESTER-4

### PAPER-4

**SUBJECT NAME:** Hematology and blood banking

**SUBJECT CODE:** USMB33

**CREDITS:** 03

**NO.OF.HOURS/ WEEK:** 03

**TOTAL HOURS:** 39

#### Course Outcomes

Semester	Course Name	Course Credit	Course Outcomes
II Regulation (2017-18)	Haematology and blood banking	03	CO1- Students to understand the Blood: Definition, Characters, Composition and Collection of Blood
			CO2- Students will able to learn Counting of Blood Cells and Haemoglobin
			CO3- Students will able to understand the Coagulation Mechanism and Hematological indices
			CO4- Students will able to learn Preparation of stains and staining techniques
			CO5- Students to understand the Concept of ABO Grouping

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	S	M	S	M	S	M	S
CO2	M	S	M	S	M	S	M	S	S	M
CO3	S	M	S	M	S	S	S	S	S	S
CO4	S	S	S	S	S	S	M	M	S	S
CO5	S	S	M	S	M	S	S	M	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

SUBJECT NAME: MICROBIAL GENETICS

SUBJECT CODE: UMB41

CREDITS: 03

NO.OF.HOURS/ WEEK: 03

TOTAL HOURS: 39

**Course Outcomes**

Semester	Course Name	Course Credit	Course Outcomes
II Regulation (2017-18)	MICROBIAL GENETICS	03	CO1- The student to understand the Historical Introduction Of Genetics.
			CO2- Students will able to learn Organization & functioning of prokaryotic genome plasmids
			CO3- The Students will able to understand the Genetransfer mechanism
			CO4- Students will able to learn Oncogenes and cancer
			CO5- Students to understand the RNA and Protein synthesis in prokaryotes and eukaryotes

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	M	S	S	S	S	S	L
CO2	S	M	S	S	M	S	S	S	S	M
CO3	S	S	S	S	S	S	S	M	L	S
CO4	S	S	M	S	S	S	M	M	S	M
CO5	M	S	S	S	M	S	S	S	S	S

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME: VERMITECH**

**SUBJECT CODE: USMB43**

**CREDITS: 03**

**NO.OF.HOURS/ WEEK: 03**

**TOTAL HOURS: 39**

<b>Sem ester</b>	<b>Course Name</b>	<b>Course Credit</b>	<b>Course Outcomes</b>
II Regulation (2017-18)	VERMITECH	03	CO1- The Students will able to understand the General properties of the soil
			CO2- Students will able to learn Physical properties of soil s
			CO3- The Students will able to understand the Soilbiota and Earthworms
			CO4- Students will able to learn Composting
			CO5 -To understand the Concept of the Earthworms in Bio-reclamation of soil.

<b>COs</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	S	S	S	M	S	S	S	S	S	M
<b>CO2</b>	M	S	S	S	S	S	S	S	S	S
<b>CO3</b>	S	S	M	S	S	S	S	M	M	L
<b>CO4</b>	S	S	S	S	S	S	S	M	L	S
<b>CO5</b>	S	S	M	S	S	S	S	S	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME: Human anatomy and physiology practical**

**SUBJECT CODE: UPMB46**

**CREDITS: 02**

**NO.OF.HOURS/ WEEK: 03**

**TOTAL HOURS: 39**

<b>Semester</b>	<b>Course Name</b>	<b>Course Credit</b>	<b>Course Outcomes</b>
<b>II Regulation (2017-18)</b>	Human anatomy and physiology Practical	<b>02</b>	CO1- Students able to perform Hair perforation Test
			CO2- students will able to get the idea of Absolute Eosinophil Count.
			CO3- Students able to examine the blood smear
			CO4- Students able to understand the Measurement of Pulse, BP
			CO5- Students able to learn Study of different histological slides .

<b>COs</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	S	S	S	M	S	S	S	S	S	S
<b>CO2</b>	M	S	S	S	S	S	M	S	S	M
<b>CO3</b>	L	S	S	S	S	S	S	M	M	S
<b>CO4</b>	S	S	S	S	S	S	M	M	L	S
<b>CO5</b>	S	S	S	S	S	S	S	S	S	S

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME: SUBJECT COVERING CORE PAPER 3&4**

**SUBJECT CODE: UPMB45**

**CREDITS: 03**

**NO.OF.HOURS/ WEEK: 03**

**TOTAL HOURS: 39**

<b>Semester</b>	<b>Course Name</b>	<b>Course Credit</b>	<b>Course Outcomes</b>
II Regulation (2017-18)	Immunology practical	02	CO1- Students able to understand the basic principles Immunological Techniques
			CO2- To Understand and maintain the instruments in Biology labs
			Co3- Students able to perform various Immunological tests
			CO4 - To perform ABO Blood grouping
			CO5- Students able to perform widal test.

<b>COs</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	S	S	S	M	S	S	S	S	S	M
<b>CO2</b>	M	S	S	S	S	S	M	S	S	S
<b>CO3</b>	S	M	L	S	M	S	S	M	L	L
<b>CO4</b>	S	S	S	S	S	S	M	M	L	S
<b>CO5</b>	S	S	S	S	S	S	S	S	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME:** Human microbial diseases, causes and control

**SUBJECT CODE:** UNMB44

**CREDITS:** 02

**NO.OF.HOURS/ WEEK:** 02

**TOTAL HOURS:** 29

Semester	Course Name	Course Credit	Course Outcomes
II Regulation (2017-18)	Immunology practical	02	1- Students able to explain pathogenicity of Gram positive organisms.
			2- Students able to get the knowledge about laboratory diagnosis of <i>Mycobacterium tuberculosis</i> .
			3- Students able to differentiate superficial infections and Opportunistic fungal infections
			4- Students able to know the life cycle of Parasitic diseases.
			5--Students able to understand the chemotherapeutic agents.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	M	S	S	S	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	L	L	S	M	S	S	M	L	S
CO4	S	S	S	S	S	S	M	S	L	S
CO5	S	M	S	S	S	S	S	S	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

## SEMESTER-5

**SUBJECT NAME:** Medical bacteriology

**SUBJECT CODE:** UMB52

**CREDITS:** 05

**NO.OF.HOURS/ WEEK:** 07

**TOTAL HOURS:** 89

Semester	Course Name	Course Credit	Course Outcomes
II B.Sc., Micro regulation 2017 – 2018) III Fifth semester	Medical bacteriology	05	CO1- To learn about the microbial relationship
			CO2- To understand the specimen processing methods
			CO3- student will get the knowledge about diagnostic fields
			CO4- TO Understanding the diagnostic methodology

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	M	S	M	S	M	S
CO2	M	S	M	S	M	S	M	S	S	M
CO3	S	M	S	M	S	S	S	M	S	S
CO4	S	S	S	S	M	S	M	M	S	M
CO5	S	S	M	S	M	S	S	M	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**



**SUBJECT NAME:** Molecular biology and genetic engineering

**SUBJECT CODE:** UMB51

**CREDITS:** 05

**NO.OF.HOURS/ WEEK:** 07

**TOTAL HOURS:** 89

Semester	Course Name	Course Credit	Course Outcomes
II B.Sc., Micro regulation 2017 – 2018) III Fifth semester	Molecular biology and genetic engineering	05	CO1- The Students will able to know the Molecular biology gives
			Co2- The Students will able to Identify and distinguish genetic regulatory mechanisms at different levels.
			CO3- The Students will able to Solve theoretical and practical problems in genetic analysis particularly concern in genetic mapping and strain constructions.
			CO4 - Students will understand how this cellular components are used to generate and utilize energy in cells
			CO5- The Students will handle the lab protocols involving molecular techniques.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	S	S	S	S	M
CO2	M	S	S	S	M	S	M	S	S	S
CO3	S	S	M	S	S	S	S	M	M	L
CO4	S	S	S	L	S	S	M	S	L	S
CO5	S	S	S	S	M	S	S	S	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME:** Medical virology, mycology and parasitology

**SUBJECT CODE:** UMB53

**CREDITS:** 05

**NO.OF.HOURS/ WEEK:** 07

**TOTAL HOURS:** 89

Semester	Course Name	Course Credit	Course Outcomes
III B.Sc., Microbiology (2017 – 2018) III Fifth semester	Medical virology, mycology and parasitology	05	CO1- Students able to understand the methods used in studying virus
			CO2- Classification of medically important virus were studied by students
			CO3- Students able to get The knowledge about viral vaccines were studied
			CO4- Students able to get the idea about the shape, size and structure of different viruses were identified by electron microscopes
			CO5- Students able to understand the ethical committee and functions

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	S	M	S	M	S	M	S
CO2	M	S	M	S	M	S	M	S	S	M
CO3	S	M	S	M	S	S	S	S	S	S
CO4	S	S	S	S	M	S	M	M	M	M
CO5	S	S	M	S	S	S	S	M	S	S

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME:** Herbal technology

**SUBJECT CODE:** MAM45

**CREDITS:** 03

**NO.OF.HOURS/ WEEK:** 03

**TOTAL HOURS:** 39

Semester	Course Name	Course Credit	Course Outcomes
III B.Sc., Micro regulation 2017 – 2018) III Fifth semester	Herbal technology	03	CO1- Students able to understand The manufacture of value added plant products were studied
			CO2- Students able to get the knowledge about traditional medicines like siddha, ayurveda, unani, 2 homeopathy were gained by students
			CO3- Students able to get the idea Phytochemicals nature and uses were studied
			CO4- Students able to get the knowledge about natural plant and their parts medicinal values
			CO5-Students to understand the herbal products.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	S	S	S	S	M
CO2	M	S	L	S	M	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	M	L
CO4	S	S	S	S	S	S	M	M	L	S
CO5	S	S	S	S	S	S	S	S	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME:** Mushroom technology

**SUBJECT CODE:** MAM45

**CREDITS:** 03

**NO.OF.HOURS/ WEEK:** 03

**TOTAL HOURS:** 39

Semester	Course Name	Course Credit	Course Outcomes
III B.Sc., Micro regulation 2017 – 2018) III Fifth semester	Mushroom technology	03	CO1- Students able to understand the edible mushroom and its uses
			CO2- students will get knowledge of profitability of small scale mushroom production and economic values were gained
			CO3- Students were gained the knowledge about different agriculture waste can be used for cultivation of mushrooms.
			CO4- Students able to learn about the production technology

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	M	S	S	S	S	S	M
CO2	M	S	M	S	S	S	M	S	S	S
CO3	S	L	S	S	S	S	S	M	M	S
CO4	S	S	M	S	S	S	M	M	L	S
CO5	S	M	S	S	S	S	S	S	S	S

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

## SEMESTER-6

**SUBJECT NAME:** Food Microbiology

**SUBJECT CODE:** UMB61

**CREDITS:** 05

**NO.OF.HOURS/ WEEK:** 05

**TOTAL HOURS:** 65

Semester	Course Name	Course Credit	Course Outcomes
III B.Sc., Micro regulation 2017 – 2018) VI semester	Food Microbiology	05	CO1 - Students able to get the knowledge the important microorganisms present in food.
			CO2- Students able to understand the principles, methods of food preservations
			CO3 - Students will able to summarize the food borne diseases.
			CO4- Students able to understand the food borne diseases
			CO5- Students able to understandthe fermented food products.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	M	S	S	M	S	M	S
CO2	M	S	M	S	M	S	M	S	S	M
CO3	S	M	S	M	S	S	S	S	S	S
CO4	S	S	S	S	M	S	M	M	M	M
CO5	S	S	M	S	M	S	S	M	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME:** Soil, Agricultural and Environmental Microbiology

**SUBJECT CODE:** UMB62

**CREDITS:** 04

**NO.OF.HOURS/ WEEK:** 05

**TOTAL HOURS:** 65

Semester	Course Name	Course Credit	Course Outcomes
III B.Sc., Microbiology (Regulation 2017 – 2018) VI Semester	Soil, Agricultural and Environmental Microbiology	04	CO1- students will learn the Outline the physical, chemical properties and micro flora of soil.
			CO2- Students able to understand the Biogeochemical cycles and its applications
			CO3- Students able to demonstrate and summarize the air and water borne pathogens.
			CO4- Students able to get the knowledge about the Treatment of waste water treatment.
			CO5- Students able to understand the layer of soil

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	S	S	S	S	S	M
CO2	M	S	M	S	S	S	S	S	M	S
CO3	S	S	S	M	S	S	S	M	M	L
CO4	S	S	M	L	S	S	M	M	L	S
CO5	S	S	S	S	S	S	S	S	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME:** Industrial and pharmaceutical Microbiology

**SUBJECT CODE:** UMB63

**CREDITS:** 05

**NO.OF.HOURS/ WEEK:** 05

**TOTAL HOURS:** 65

Semester	Course Name	Course Credit	Course Outcomes
III B.Sc., Micro regulation 2017 – 2018) VI semester	Industrial and pharmaceutica Microbiology	05	CO1- Students able to get the idea with theoretical and practical understanding of Industrial microbiology.
			CO2- Students able to learn the microbiology is applied in the manufacture of Industrially significant products.
			CO3- Students able to understand the production of pharmaceutical products
			CO4- Students able to make the students will create the summary of downstream processing
			CO5 - Students able to understand the downstream process.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	S	S	S	S	M
CO2	M	M	S	S	S	S	L	S	S	S
CO3	S	S	S	S	S	S	S	M	M	L
CO4	S	M	S	S	S	S	M	M	L	S
CO5	S	S	S	S	S	S	S	S	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME:** Bioinoculants Technology

**SUBJECT CODE:** UEMB64

**CREDITS:** 03

**NO.OF.HOURS/ WEEK:** 03

**TOTAL HOURS:** 39

Semester	Course Name	Course Credit	Course Outcomes
III B.Sc., Micro regulation 2017 – 2018) VI semester	Bioinoculants Technology	03	CO1- Students able to understanding microbes used in biofertilizers technique
			CO2-Students able to know the nitrogen fixing bacteria
			CO3- Students able to get idea about cultivation and mass production Blue green algae
			CO4- To understand Phosphate solubilizers and mycorrhizae as bioinoculants
			CO5-Students able to know Rhizobium mass production.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	S	S	S	S
CO2	M	S	S	S	S	S	M	S	M	S
CO3	S	S	S	L	S	S	S	M	M	M
CO4	S	S	S	S	S	S	M	M	L	L
CO5	S	S	S	M	S	S	S	S	S	S

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**



**SUBJECT NAME:** Food Analysis and quality Control

**SUBJECT CODE:** UEMB65

**CREDITS:** 03

**NO.OF.HOURS/ WEEK:** 03

**TOTAL HOURS:** 39

Semester	Course Name	Course Credit	Course Outcomes
III B.Sc., Micro regulation 2017 – 2018) VI semester	food Analysis and quality Control	03	CO1- Students able to Focus on physical, chemical microbial sensory analysis of food.
			CO2- Students able to understand concepts of food control and quality
			CO3- Students able to Understand food management .
			CO4- Students able to Understand international food loss
			CO5- Students able to Understand adulterants in various food products

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	S	S	S	S	M
CO2	S	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	M	S	M	L	L
CO4	S	S	S	S	S	L	M	M	L	S
CO5	S	S	S	S	S	S	S	S	S	M

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME:** Bioinstrumentation

**SUBJECT CODE:** USMB66

**CREDITS:** 03

**NO.OF.HOURS/ WEEK:** 03

**TOTAL HOURS:** 39

Semester	Course Name	Course Credit	Course Outcomes
III B.Sc., Micro regulation 2017 – 2018) VI semester	Bioinstrumentation	03	CO1- Students will get idea on basic instruments type and principles.
			CO2- Students able to understand the students about Chromatography techniques
			CO3- Students able to Understand the analytic techniques of radioisotopes
			CO4- Students able to understand the Biosensor
			CO5- Students able to understand the HPLC techniques.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	S	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	L	S	M	S	L
CO4	S	S	S	S	S	S	M	M	S	S
CO5	S	S	S	S	S	M	S	S	S	S

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME:** Core practical-III

**SUBJECT CODE:** UPMB67

**CREDITS:** 03

**NO.OF.HOURS/ WEEK:** 03

**TOTAL HOURS:** 39

Semester	Course Name	Course Credit	Course Outcomes
III B.Sc., Micro regulation 2017 – 2018) VI semester	Core practical- III	03	1- Students able to understand the General requirements of collections, transport of clinical specimens Direct examinations - staining of specimens, - Methods of enriched, selective and enrichment culture techniques used to isolate organisms from clinical materials.
			2- Wet mounts examinations of stool for parasites. Cholera stool, vaginal specimens for Trichomonas.
			3- Students able to learn about the KOG and Lacto phenol preparations for skin scrapings, for fungi and for scabies mites.
			4- students will get the idea Of Simple, differential and special staining techniques of clinical materials viz. Throat swab, vaginal swab, slit smears, pus, urine, sputum, stool etc.,
			CO5- Students able to learn various diagnosis techniques.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	S	S	M	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	M	M
CO4	S	S	S	S	S	S	M	M	L	M
CO5	S	S	S	S	S	S	S	S	S	S

**PO- Programme outcome, CO- Course outcome**

**S- Strong, M- Medium, L- Low ( may be avoided)**

**SUBJECT NAME:** Core practical-IV

**SUBJECT CODE:** UPMB68

**CREDITS:** 03

**NO.OF.HOURS/ WEEK:** 03

**TOTAL HOURS:** 39

Semester	Course Name	Course Credit	Course Outcomes
III B.Sc., Microbiology (2017 – 2018) VI semester	Core practical- IV	03	1- Students able to understand the water analysis by MPN technique Presumptive coli forms test Confirmed coli forms test Completed coli forms test.
			2- students will able to get the idea Isolation of microorganisms from air - air sampler technique - settle plate method.
			3.- Students able to understand the idea about Isolation and counting of fecal bacteria from water.
			4- Students able to learn the Detection of bacteria in milk by SPC - Dye reduction test Detection of number of bacteria in milk.
			5- Students able to create the the summary report of Litmus mil reaction

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	S	S	S	S	S
CO2	M	S	S	S	S	S	M	M	S	S
CO3	S	S	S	S	M	S	S	S	M	S
CO4	M	S	S	S	M	S	M	S	L	S
CO5	S	S	S	S	S	S	S	S	S	S

**PO- Programme outcome, CO- Course outcome S- Strong, M- Medium, L- Low ( may be avoided)**

