

B.Sc., Microbiology

Program Outcomes:

<u>S.No</u>	<u>OUTCOMES</u>
PO1	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.
PO2	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.
PO3	Also it understand the relationship between the science and society by recognizing and discussing logical, scientific and ethical issues in Microbiology.
PO4	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
PO5	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.
PO6	Graduates would acquire both theoretical and practical knowledge of fundamental concepts in Microbiology.
PO7	Graduates would knowledgeably be competent with characteristics, skills and cognizance established.
PO8	A microbiologist could enter into higher studies for their passion of futuristic drive or could prefer academia for manifesting instructional capability.
PO9	After graduation, the graduates can join public health sectors not only for career advancement but, for the betterment/welfare of the human society as well.
PO10	Understand and appreciate the importance of microbes in different arena of novelty for day-to-day applications.

Program specific Outcomes:

<u>S.No</u>	<u>OUTCOMES</u>
PSO1	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.
PSO2	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.
PSO3	The skill enhancement elective course such as algal technology, mushroom cultivation and herbal technology to develop their knowledge.
PSO4	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.
PSO5	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.Sc MICROBIOLOGY – (2022-2023 onwards)

SEMESTER: I

PAPER- 1

FUNDAMENTALS OF MICROBIOLOGY

SUBJECT CODE: CMB11

NO.OF.HOURS/ WEEK: 06

CREDITS:04

TOTAL HOURS:45

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
I Regulation 2022-2023	FUNDAMENTALS OF MICROBIOLOGY	04	CO1- After studying unit-1, the student will be able to Understand the scope and relevance of Microbiology as a scientific discipline
			CO2- After studying unit-2, the student will be able to Decide on the correct type of microscopy and staining
			CO3- After studying unit-3, the student will be able to Gain knowledge on the various classification of microorganisms
			CO4- After studying unit-4, the student will be able to Study the morphology and structure of microorganism
			CO5- After studying unit-5, the student will be able to Get acquainted with various sterilization techniques

Course Material: website links, e-Books and e-journals Mapping

with Programme Outcomes

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

SEMESTER: II

MICROBIAL PHYSIOLOGY
SUBJECT CODE: CMB21
NO.OF.HOURS/ WEEK: 05

CREDITS:04
TOTAL HOURS:45

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
II Regulation (2022- 2023)	MICROBIAL PHYSIOLOGY	04	CO1- 1. After studying unit-1, the student will be able to Outline on the nutritional requirement and nutritional types of bacteria.
			CO2- After studying unit-2, the student will be able to Demonstrate various techniques employed in the cultivation of microorganisms
			CO3- After studying unit-3, the student will be able to Discuss on the different phases of microbial growth
			CO4- After studying unit-4, the student will be able to Explain the basic concepts of microbial metabolism
			CO5- After studying unit-5, the student will be able to Elaborate on the biosynthesis of bacterial cell wall and mechanism of photosynthesis

Mapping with Programme Outcomes

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

SEMESTER: II

EXPERIMENTS IN BASIC MICROBIOLOGY

SUBJECT CODE: CPMB22

NO.OF.HOURS/ WEEK: 03

CREDITS:02

TOTAL HOURS:20

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
II Regulation (2022-2023)	EXPERIMENTS IN BASIC MICROBIOLOGY	02	CO1- the student will be able to observe microorganisms by staining
			CO2- , demonstrate motility of bacteria
			CO3- determine the size of microorganisms
			CO4- prepare culture media
			CO5- 1. demonstrate the biochemical activity bacteria.

Mapping with Programme Outcomes

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

SEMESTER: III

IMMUNOLOGY

SUBJECT CODE: CMB31

NO.OF.HOURS/ WEEK: 04

CREDITS:4

TOTAL HOURS:45

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
III Regulation (2022- 2023)I	IMMUNOLOGY	04	CO1 After studying unit-1, the student will be able to Outline the history and scope of Immunology.
			CO2- , After studying unit-2, the student will be able to Explain the structure, functions and properties of immune cells
			CO3- After studying unit-3, the student will be able to Compare the different types of antibodies and relate them to antigens
			CO4- After studying unit-4, the student will be able to Comprehend on the complement system and Major histocompatibility complex
			CO5- 1. After studying unit-5, the student will be able to Familiarize with immunohaematology and hypersensitivity reaction

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

SEMESTER: III

HAEMATOLOGY AND BLOOD BANKING
SUBJECT CODE:CSMB33
NO.OF.HOURS/ WEEK: 02

CREDITS:2
TOTAL HOURS:20

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
III Regulation (2022-2023) I	HAEMATOL OGY AND BLOOD BANKING	02	CO1 After studying unit-1, the student will be able to Discuss in detail the collection and processing of blood.
			CO2- , After studying unit-2, the student will be able to Understand the appropriate methods of diagnosis and management of disorders
			CO3- After studying unit-3, the student will be able to Understand how to diagnose and manage hematological disorders and blood parasites
			CO4- After studying unit-4, the student will be able to Appreciate the various types of blood group systems
			CO5- 1. After studying unit-5, the student will be able to Know the methods of preservation, storage and transportation of blood to distant places

Mapping with Programme Outcomes

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

SEMESTER: III

MICROBES IN HUMAN WELFARE
SUBJECT CODE:CNMB34
NO.OF.HOURS/ WEEK: 02

CREDITS:2
TOTAL HOURS:20

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
III Regulation (2022-2023)	MICROBES IN HUMAN WELFARE	02	CO1 After studying unit-1, the student will be able to Understand the scope and relevance of Microbiology in daily life
			CO2- , After studying unit-2, the student will be able to Gain knowledge on the various types of microorganisms
			CO3- After studying unit-3, the student will be able to Understand the potential of microorganisms
			CO4- After studying unit-4, the student will be able to Appreciate the beneficial aspects of microorganisms
			CO5-. After studying unit-5, the student will be able to Get acquainted with various ways of using microorganisms

Mapping with Programme Outcomes

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	S	M	S	M
CO3	S	M	S	M	S	S	S	S	M	S
CO4	S	S	S	S	M	S	M	S	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

SEMESTER: IV

MICROBIAL GENETICS
SUBJECT CODE: CMB41
NO.OF.HOURS/ WEEK: 04

CREDITS:4
TOTAL HOURS:45

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
IV Regulation (2022- 2023)	MICROBIAL GENETICS	04	CO1 After studying unit-1, the student will be able to Outline the structure, replication and function of DNA
			CO2- , After studying unit-2, the student will be able to Explain about mutation, types of mutation and DNA repair mechanism
			CO3- After studying unit-3, the student will be able to Elaborate the different gene transfer methods in bacteria
			CO4- After studying unit-4, the student will be able to Compile the gene regulation in prokaryotes and eukaryotes
			CO5-. After studying unit-5, the student will be able to Describe transposons and gene mapping

Mapping with Programme Outcomes

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	S	S	S	S	M	M	S
CO4	S	S	S	S	S	S	M	M	S	M
CO5	S	S	M	S	M	S	S	S	S	M

PO – Programme Outcome, CO – Course outcomeS –

Strong , M – Medium, L – Low

SEMESTER: IV

EXPERIMENTS IN IMMUNOLOGY AND MICROBIAL GENETICS

SUBJECT CODE: CPMB45

CREDITS: 3

NO. OF HOURS/ WEEK: 03

TOTAL HOURS: 39

Course Outcomes

Semester	Course Name	Course Credit	Course Outcomes
IV Regulation (2022- 2023)	EXPERIMENTS IN IMMUNOLOGY AND MICROBIAL GENETICS	03	CO1 the student will be able to separate Serum and Plasma from blood
			CO2- , the student will be able to identify blood groups
			CO3- the student will be able to do differential Count of blood cells
			CO4- the student will be able to perform immune diffusion
			CO5-. the student will be able to demonstrate antibiotic resistant bacteria

Mapping with Programme Outcomes

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

SEMESTER: IV

MUSHROOM CULTIVATION
SUBJECT CODE:CSMB43
NO.OF.HOURS/ WEEK: 02

CREDITS:2
TOTAL HOURS:20

Semester	Course Name	Course Credit	Course Outcomes
III Regulation (2022-2023)I	MUSHROOM CULTIVATION	02	CO1 After studying unit-1, the student will be able to Outline the structure, cultivation of mushroom
			CO2- , After studying unit-2, the student will be able to Explain about Spawn preparation
			CO3- After studying unit-3, the student will be able to Elaborate the Cultivation of important Mushroom varieties
			CO4- After studying unit-4, the student will be able to Appreciate the nutritional value of mushrooms
			CO5-. After studying unit-5, the student will be able to Describe the economic aspects of mushroom cultivation

Mapping with Programme Outcomes

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

SEMESTER: IV

EMERGING MICROBIAL DISEASES
SUBJECT CODE:CNMB44
NO.OF.HOURS/ WEEK: 02

CREDITS:2
TOTAL HOURS:20

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
IV Regulation (2022- 2023)	EMERGING MICROBIAL DISEASES	02	CO1 After studying unit-1, the student will be able to explain the mode of disease transmission
			CO2- , After studying unit-2, the student will be able to recognize and prevent diseases caused by bacteria
			CO3- After studying unit-3, the student will be able to recognize and prevent fungal diseases
			CO4- After studying unit-4, the student will be able to recognize and prevent parasitic diseases
			CO5-. After studying unit-5, the student will be able to understand and prevent viral diseases

Mapping with Programme Outcomes

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	M	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	M	S	S	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

SEMESTER V

Medical Bacteriology and Mycology

SUBJECT CODE:CMB51

NO.OF.HOURS/ WEEK: 06

CREDITS:6

TOTAL HOURS:77

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
V Regulation (2022- 2023)	Medical Bacteriology and Mycology	06	CO1 After studying unit-1, the student will be able to outline the importance of Normal microbial flora of human body and Host-Parasite relationships.
			CO2- , After studying unit-2, the student will be able to explain about the diseases caused by the bacterial pathogens, prevention and treatment
			CO3- After studying unit-3, the student will be able to discuss the different modes of transmission of bacterial diseases and the preventive measures
			CO4- After studying unit-4, the student will be able to compare the morphological classification of fungi, and perform isolation of fungi from clinical specimen
			CO5-. After studying unit-5, the student will be able to compile the common mycotic diseases, their pathogenicity and various antifungal agents used for treatment

Mapping with Programme Outcomes

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

SEMESTER V

Agricultural and Environmental Microbiology

SUBJECT CODE:CMB52

NO.OF.HOURS/ WEEK: 06

CREDITS:5

TOTAL HOURS:65

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
V Regulation (2022- 2023)	Agricultural and Environmental Microbiology	05	CO1 After studying unit-1, the student will be able to outline the physical, chemical properties and microflora of soil
			CO2- , After studying unit-2, the student will be able to explain the role of microorganisms in biogeochemical cycles
			CO3- After studying unit-3, the student will be able to compile the significance of microbial interactions and phytopathogens
			CO4- After studying unit-4, the student will be able to demonstrate the air sampling techniques and summarize on air borne pathogens
			CO5-. After studying unit-5, the student will be able to apply the processes involved in the treatment of municipal water supplies

Mapping with Programme Outcomes

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	S	M	M	S	S	M
CO3	S	M	S	M	S	S	S	S	M	S
CO4	S	S	M	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

SEMESTER: V

FOOD MICROBIOLOGY
SUBJECT CODE:CMB53
NO.OF.HOURS/ WEEK: 05

CREDITS:5
TOTAL HOURS:55

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
V Regulation (2022- 2023)	FOOD MICROBIOL OGY	05	CO1 After studying unit-1, the student will be able to Outline the important microorganisms present in food.
			CO2- After studying unit-2, the student will be able to Elaborate the principles and methods of food preservation
			CO3- After studying unit-3, the student will be able to Compile the contamination, spoilage and spoilage of various foods
			CO4- After studying unit-4, the student will be able to Demonstrate and prepare fermented foods
			CO5-. After studying unit-5, the student will be able to Summarize bacterial and non-bacterial food borne diseases

Course Material: website links, e-Books and e-journals

Mapping with Programme Outcomes

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

SEMESTER: V

IMMUNOTECHNOLOGY

SUBJECT CODE:CEMB54A
NO.OF.HOURS/ WEEK: 03

CREDITS:3
TOTAL HOURS:39

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
V Regulation (2022-2023)	IMMUNOTECHNOLOGY	03	CO1 After studying unit-1, the student will be able to understand basic concepts of Immunotechnology
			CO2- After studying unit-2, the student will be able to demonstrate Antigen - Antibody reactions
			CO3- After studying unit-3, the student will be able to express the concept of Autoimmunity
			CO4- After studying unit-4, the student will be able to explain the role of Cytokines
			CO5-. After studying unit-5, the student will be able to discuss the role of vaccines in preventing diseases.

Mapping with Programme Outcomes

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	S	S	M	S	S	M
CO3	S	M	S	M	S	S	S	S	M	S
CO4	S	S	S	S	M	M	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

SEMESTER: V

HUMAN ANATOMY ANDPHYSIOLOGY

SUBJECT CODE:CEMB54B

NO.OF.HOURS/ WEEK: 03

Course Out Comes

CREDITS:3

TOTAL HOURS:39

Semester	Course Name	Course Credit	Course Outcomes
V Regulation (2022-2023)	HUMAN ANATOMY AND PHYSIOLOG Y	03	CO1 After studying unit-1, the student will be able to Explain the organs and functions of Respiratory System.
			CO2- After studying unit-2, the student will be able to Outline the structure of organs of Gastro Intestinal System.
			CO3- After studying unit-3, the student will be able to Discuss about the Musculoskeletal and Nervous System
			CO4- After studying unit-4, the student will be able to Describe the features of Circulatory system and Endocrine System
			CO5-. After studying unit-5, the student will be able to Compile the information on Reproductive and urinary System

Mapping with Programme Outcomes

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	M	S
CO4	S	S	S	S	M	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

SEMESTER: V

CELL BIOLOGY
SUBJECT CODE:CEMB54C
NO.OF.HOURS/ WEEK: 03
Course Out Comes

CREDITS:3
TOTAL HOURS:39

Semester	Course Name	Course Credit	Course Outcomes
V Regulation (2022-2023)	CELL BIOLOGY	03	CO1 - After studying unit-1, the student will be able to understand the structures and purposes of basic components of prokaryotic and eukaryotic cells
			CO2- After studying unit-2, the student will be able to explain how the cellular components are used to generate and utilize energy in cells
			CO3- After studying unit-3, the student will be able to understand the cellular components underlying mitotic cell division
			CO4- After studying unit-4, the student will be able to summarize the structure and function of the different cell components
			CO5-. After studying unit-5, the student will be able to outline how cell ultra structure is related to cell function.

Course Material: website links, e-Books and e-journals

Mapping with Programme Outcomes

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	M	S	M
CO3	S	M	S	S	S	S	S	S	S	S
CO4	S	S	S	S	M	S	M	S	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

SEMESTER: V

BIOINFORMATICS
SUBJECT CODE:CSMB55
NO.OF.HOURS/ WEEK: 02

CREDITS:2
TOTAL HOURS:20

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
V Regulation (2022-2023)	BIOINFORM ATICS	02	CO1 - After studying unit-1, the student will be able to Explain Databases and Sequence analysis
			CO2- After studying unit-2, the student will be able to Outline the process of BLAST and Gene prediction
			CO3- After studying unit-3, the student will be able to Discuss about the concept of Comparative Genomics
			CO4- After studying unit-4, the student will be able to Describe the Genome projects and Model Organisms
			CO5-. After studying unit-5, the student will be able to Compile the information on Proteomics

Mapping with Programme Outcomes

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

PO – Programme Outcome, CO – Course outcome

S – Strong , M – Medium, L – Low

SEMESTER: VI

MEDICAL VIROLOGY AND PARASITOLOGY

SUBJECT CODE: CMB61

NO.OF.HOURS/ WEEK: 06

CREDITS:6

TOTAL HOURS:77

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
VI Regulation (2022-2023)	MEDICAL VIROLOGY AND PARASITOL OGY	06	CO1 - After studying unit-1, the student will be able to Explain the properties, classification and cultivation of viruses
			CO2- After studying unit-2, the student will be able to Outline the zoonotic and arthropod borne diseases
			CO3- After studying unit-3, the student will be able to Discuss about the oncogenic viruses
			CO4- After studying unit-4, the student will be able to Describe the classification of parasites and demonstrate the laboratory diagnosis of parasitic diseases
			CO5-. After studying unit-5, the student will be able to Compile the information on common parasites, protozoan and metazoan diseases

Mapping with Programme Outcomes

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

SEMESTER: VI

INDUSTRIAL MICROBIOLOGY

SUBJECT CODE:CMB62

NO.OF.HOURS/ WEEK: 05

CREDITS:5

TOTAL HOURS:65

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
VI Regulation (2022-2023)	INDUSTRIAL MICROBIOL OGY	05	CO1 - After studying unit-1, the student will be able to Outline the history and scope of Industrial Microbiology
			CO2- After studying unit-2, the student will be able to Explain about the methods involved in screening and development of production strains
			CO3- After studying unit-3, the student will be able to Elaborate on the principles, design and types of bioreactors
			CO4- After studying unit-4, the student will be able to Compile on the fermentation process and downstream processing
			CO5-. After studying unit-5, the student will be able to Discuss on the industrial production of various products using microorganisms

Mapping with Programme Outcomes

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	S	S	S	M
CO3	S	M	S	M	S	S	S	S	S	S
CO4	S	S	S	S	M	M	M	M	M	S
CO5	S	S	M	S	M	S	S	M	S	M

PO – Programme Outcome, CO – Course outcome

S – Strong , M – Medium, L – Low

SEMESTER: VI

EXPERIMENTS IN MEDICAL MICROBIOLOGY

SUBJECT CODE:CPMB66

NO.OF.HOURS/ WEEK: 03

Course Out Comes

CREDITS:3

TOTAL HOURS:39

Semester	Course Name	Course Credit	Course Outcomes
VI Regulation (2022-2023)	EXPERIMENTS IN MEDICAL MICROBIOLOGY	03	CO1 - the student will be able to observe pathogenic microorganisms in specimens by microscopy
			CO2- the student will be able to isolate pathogenic bacteria from clinical specimens
			CO3- the student will be able to identify pathogenic bacteria from clinical specimens
			CO4- the student will be able to characterize pathogenic bacteria isolated from clinical specimens
			CO5-. the student will be able to find out the antibiotic susceptibility pattern of pathogenic bacteria.

Mapping with Programme Outcomes

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

PO – Programme Outcome, CO – Course outcome

S – Strong , M – Medium, L – Low

SEMESTER: VI

EXPERIMENTS IN APPLIED MICROBIOLOGY

SUBJECT CODE:CPMB67

NO.OF.HOURS/ WEEK: 03

Course Out Comes

CREDITS:3

TOTAL HOURS:39

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
VI Regulation (2022- 2023)I	EXPERIMENTS IN APPLIED MICROBIOLOGY	03	CO1 - the student will be able to observe microorganisms in spoiled food and vegetables
			CO2- the student will be able to enumerate the microorganisms in air, water and soil
			CO3- the student will be able to enumerate the coliforms in water
			CO4- the student will be able to demonstrate the production of enzymes by bacteria
			CO5-. the student will be able to demonstrate the presence of Rhizobium in root nodules

Mapping with Programme Outcomes

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

SEMESTER: VI

BIOTECHNOLOGY
SUBJECT CODE:CEMB63A
NO.OF.HOURS/ WEEK: 03

CREDITS:3
TOTAL HOURS:39

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
VI Regulation (2022- 2023)	BIOTECHNO LOGY	03	CO1 - After studying unit-1, the student will be able to understand basic concepts of Biotechnology
			CO2- After studying unit-2, the student will be able to demonstrate the uses of enzymes
			CO3- After studying unit-3, the student will be able to express the importance of plant biotechnology
			CO4- After studying unit-4, the student will be able to explain the role of animal biotechnology
			CO5-. After studying unit-5, the student will be able to discuss the role of microorganisms in environment.

Mapping with Programme Outcomes

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

PO – Programme Outcome, CO – Course outcome

S – Strong , M – Medium, L – Low

SEMESTER: VI

HERBAL TECHNOLOGY
SUBJECT CODE:CEMB63B

NO.OF.HOURS/ WEEK: 03

CREDITS:3

TOTAL HOURS:39

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
T Regulation (2022- 2023)	HERBAL TECHNOLOG Y	03	CO1 - After studying unit-1, the student will be able to get acquainted with the basics of Pharmacognosy
			CO2- After studying unit-2, the student will be able to Gain knowledge of medicinal plants
			CO3- After studying unit-3, the student will be able to Understand the use of various medicinal plants
			CO4- After studying unit-4, the student will be able to Appreciate the Herbal medicines used to treat human ailments
			CO5-. After studying unit-5, the student will be able to Understand the Propagation methods of medicinal plants

Mapping with Programme Outcomes

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	S	S	M	S	S	S	S	M
CO3	S	M	S	M	S	S	S	S	S	S
CO4	S	S	S	S	S	S	M	S	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

SEMESTER: VI

GENETIC ENGINEERING
SUBJECT CODE:CEMB63C
NO.OF.HOURS/ WEEK: 03

CREDITS:3
TOTAL HOURS:39

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
VI Regulation (2022-2023)	GENETIC ENGINEERIN G	03	CO1 - After studying unit-1, the student will be able to Get acquainted with the basics of Genetic Engineering
			CO2- After studying unit-2, the student will be able to Understand the role of various enzymes acting on DNA
			CO3- After studying unit-3, the student will be able to Gain knowledge of Cloning vectors
			CO4- After studying unit-4, the student will be able to Understand the Gene / DNA transfer techniques
			CO5-. After studying unit-5, the student will be able to Appreciate the applications of rDNA technology.

Mapping with Programme Outcomes

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

PO – Programme Outcome, CO – Course outcome

S – Strong , M – Medium, L – Low

SEMESTER: VI

BIOINOCULANTS TECHNOLOGY

SUBJECT CODE:CEMB64A

NO.OF.HOURS/ WEEK: 03

CREDITS:3

TOTAL HOURS:39

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
VI Regulation (2020-21)	BIOINOCULANTS TECHNOLOGY	03	CO1 - After studying unit-1, the student will be able to Understand the role of Plant Growth Promoting Rhizobacteria
			CO2- After studying unit-2, the student will be able to Get acquainted with production and field application of Rhizobium and Frankia
			CO3- After studying unit-3, the student will be able to Gain knowledge of Cyanobacteria as N2 fixers
			CO4- After studying unit-4, the student will be able to Understand the Phosphate solubilizing microbes
			CO5-. After studying unit-5, the student will be able to Appreciate the role of Mycorrhiza in plant growth promotion

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	S	M	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	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

SEMESTER: VI

CLINICAL MICROBIOLOGY
SUBJECT CODE:CEMB64B

NO.OF.HOURS/ WEEK: 03

CREDITS:3

TOTAL HOURS:39

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
VI Regulation (2020-21)	CLINICAL MICROBIOL OGY	03	CO1 - After studying unit-1, the student will be able to Collect various clinical specimens for microbiological examination.
			CO2- After studying unit-2, the student will be able to Gain knowledge on infections of different organ and organ system
			CO3- After studying unit-3, the student will be able to Comprehend the different modes of transmission of infection, prevention and its control
			CO4- After studying unit-4, the student will be able to outline the importance of immunoprophylaxis, genetic disorders and gene therapy
			CO5-. After studying unit-5, the student will be able to Perform laboratory tests to detect infection and diseases.

Mapping with Programme Outcomes

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	S	S	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

SEMESTER: VI

FOOD ANALYSIS AND QUALITY CONTROL

SUBJECT CODE:CEMB64C

NO.OF.HOURS/ WEEK: 03

CREDITS:3

TOTAL HOURS:39

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
VI Regulation (2020-21)	FOOD ANALYSIS AND QUALITY CONTROL	03	CO1 - After studying unit-1, the student will be able to Understand the Techniques used in food analysis
			CO2- After studying unit-2, the student will be able to Get acquainted with various food analysis methods
			CO3- After studying unit-3, the student will be able to Gain knowledge on the various methods of food quality assessment
			CO4- After studying unit-4, the student will be able to Understand the Food quality management procedures
			CO5- After studying unit-5, the student will be able to Appreciate the role of Food Safety organizations.

Mapping with Programme Outcomes

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	S	S	M	S	S	S	S	S	S
CO4	S	S	S	S	M	S	M	S	S	S
CO5	S	S	M	S	M	S	S	M	S	M

PO – Programme Outcome, CO – Course outcome

S – Strong , M – Medium, L – Lo

SEMESTER: VI

MEDICAL LABORATORY TECHNIQUES

SUBJECT CODE:CSMB65

NO.OF.HOURS/ WEEK: 02

CREDITS:2

TOTAL HOURS:20

Course Out Comes

Semester	Course Name	Course Credit	Course Outcomes
VI Regulation (2020-21)	MEDICAL LABORATOR Y TECHNIQUE S	02	CO1 - After studying unit-1, the student will be able to Outline the general laboratory procedures for collection of various specimens
			CO2- After studying unit-2, the student will be able to Explain the mechanism of coagulation and procedures carried out in estimation of blood cells
			CO3- After studying unit-3, the student will be able to Describe about chemical and microbiological examination of CSF, Urine, semen, stool and vaginal fluids
			CO4- After studying unit-4, the student will be able to Elaborate on the collection and testing of amniotic fluid, gastric juice, lymph, sputum and synovial fluid
			CO5-. After studying unit-5, the student will be able to Apply the theoretical knowledge in practice

Mapping with Programme Outcomes

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	S	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