NEP SYLLABUS

Programme outcomes (CO)

At the end of the program the student should be able to:

PO1. Knowledge and understanding of concepts of microbiology and its application in pharma, food, agriculture, beverages, nutraceutical industries.

PO2. Understand the distribution, morphology and physiology of microorganisms and demonstrate the skills in aseptic handling of microbes including isolation,identification and maintenance

PO3. Competent to apply the knowledge gained for conserving the environment and resolving the environmental related issues.

PO4. Learning and practicing professional skills in handling microbes and contaminants in laboratories and production sectors.

PO5. Exploring the microbial world and analyzing the specific benefits and challenges.

PO6. Applying the knowledge acquired to undertake studies and identify specific remedial measures for the challenges in health, agriculture, and food sectors.

PO7. Thorough knowledge and application of good laboratory and good manufacturing practices in microbial quality control.

PO8. Understanding biochemical and physiological aspects of microbes and developing broader perspective to identify innovative solutions for present and future challenges posed by microbes.

PO9. Understanding and application of microbial principles in forensic and working knowledge about clinical microbiology.

PO10. Demonstrate the ability to identify ethical issues related to recombinant DNA technology, GMOs, intellectual property rights, biosafety and biohazards.

PO11. Demonstrate the ability to identify key questions in microbiological research,optimize research methods, and analyse outcomes by adopting scientific methods, there by improving the employ ability.

PO12. Enhance and demonstrate analytical skills and apply basic computational and statistical techniques in the field of microbiology

Programme Specific Outcomes (PSOs) for B.Sc Microbiology

Sl. no	**On completing the course, the student will be able to:**
PSO 1	Gain insight of Microbiology starting from history, understand the nature and basic concepts of microbiology, microbial biochemistry, microbial ecology.
PSO 2	Acquire the skill in the use and care of basic microbiological equipment; performance of basic laboratory procedures, proper collection and forwarding of specimens to the laboratory.
PSO 3	Emphasize distribution, morphology and physiology of microorganisms in addition to skills in aseptic procedures, isolation and identification.
PSO 4	Analyse the relationships among microbes and plants/animals/ humans.
PSO 5	Understand the applications of Microbiological sciences in Agriculture, Medicine, Environment, industry etc.
PSO 6	Explore the application of genetic engineering

Course Outcomes (COs)

Course title: General Microbiology
Course code: DSC-1T, MBL 101

Sl. no	On completing the course, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Understand the basic concepts of microbiology.	1,2	R, U
CO 2	Learn and practice professional skills in handling microbes.	1,2,4	R, U, C
CO 3	Understand the contributions of different scientists.	1,2	U, An
CO 4	Understand and explain basic principles of different types of microscopes.	4,7	R, U, An
CO 5	Understand the ultra structure of Bacterial cell and differentiate between Prokaryotes and Eukaryotes.	4,5,8	U, Ap, An,E, C

Course title: General Microbiology Practicals
Coursecode: DSC-1P, MBL 101

Sl. no	On completing the course, the student will be able to:	PSOs addressed
CO 1	Study of different microorganisms with permanent slides, motility of organisms.	1,2,4
CO 2	Attain the practical skills in microscopy and their handling techniques.	2,4
CO 3	Understand working and mechanism of different equipments and tools used in Microbiology.	1,4,7
CO 4	Perform the staining technique of various microorganisms.	4,7

Course title: Microbial Biochemistry and Physiology
Course code: DSC-2T, MBL 102

Sl. no	On completing the course, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Understand the basic Biochemical concepts.	2,8	U, R
CO 2	Understand the importance of nutritrional requirements, microbial growth and factors influencing microbial growth and growth curve.	7,8	U, An, E
CO 3	Understand the general stratergy of metabolism and explain various metabolic processes operating in living cell.	5,8	U, An, E
CO 4	Illustrate various metabolic pathways like EMP cycle, TCA, ED pathway, Glyoxylate cycle and Beta oxidation cycle.	8,11	R, U, An
CO 5	Understand the concept of fermentation and respiration.	7,8	U, An
CO 6	Describe the importance of photosynthesis in microorganisms.	5,7	R, U, An

Course title: Microbial Biochemistry and Physiology Practicals
Course code: DSC-2P, MBL 102

Sl. no	On completing the course, the student will be able to:	PSOs addressed
CO 1	Preperation of different solutions	7,8
CO 2	Qualitative and Quantitative identification of different Biomolecules.	7,8
CO 3	Determination of Bacterial growth	7,8

Course title: Microbial Diversity
Course code: DSC-3T, MBL 103

Sl. no	On completing the course, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Knowledge about microbes and their diversity.	1,3,5	R, U
CO 2	Understand the classification of Biosystematics.	2,5	R,U
CO 3	Study, characters, classification and economic importance of Pro-eukaryotic and Eukaryotic microbes.	2,3	R,U, An
CO 4	Knowledge about viruses and their diversity	2,3	R, U

Course title: Microbial Diversity Practicals
Course code: DSC-3P, MBL 103

Sl. no	On completing the course, the student will be able to:	PSOs addressed
CO 1	Isolation of bacteria from soil, air and water	2,4,7
CO 2	Cultivation of Cyanobacteria and Actinomycetes.	2,4
CO 3	Study of different microorganisms	2,5

Course title: Microbial Enzymology and Metabolism
Course code: DSC-4T, MBL 104

Sl. no	On completing the course, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Understand the general stratergy of metabolism and explain various metabolic processes operating in living cell.	2,8	U, An, E
CO 2	Understand the concept of fermentation and respiration.	1,2	U, Ap
CO 3	Differentiating concepts chemoheterotrophic metabolism and chemolithotrophic metabolism	1,8	U, An, E
CO 4	Understand the concept of enzyme activities, enzyme kinetics, classification and factor influencing enzyme activity.	1,2	U, An, E
CO 5	Understand the concepts of enzyme regulation.	1,2	U, Ap, An
CO 6	Study different metabolic pathways in microorganisms.	2,8	R, U, C

Course title: Microbial Enzymology and Metabolism Practicals
Course code: DSC-4P, MBL 104

Sl. no	On completing the course, the student will be able to:	PSOs addressed
CO 1	Estimate sugars, proteins by biochemical methods.	2,4,8
CO 2	Estimation of DNA, RNA and polyphenols.	2,4,10
CO 3	Demonstration of alcoholic fermentation	2,4
CO 4	Effect of variables on enzyme activity.	2,4