**COURSE OUTCOMES**

**B.Sc – Industrial Microbiology Ist year**

**Semester- I**

**Subject: Fundamentals of Industrial microbiology (Theory & Practical)**

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| **Co1**. | Understand the historical development and scope of microbiology. |
| **Co2**. | Acquaint with the different types of microorganisms, their structure, nutritional requirement. |
| **Co3** | . Describe several techniques of isolation of microorganisms from various sources and methods of preservation of microorganisms. |
| **Co4** | . Familiarize with the different staining techniques for visualization of microorganisms under the microscope |

 **Subject: Microbial Biochemistry (Theory & Practical)**

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| **CO1**.  | Study the basic aspects of bioenergetics Entropy, enthalpy, e-carriers, e-donors, inhibitors, uncouplers, energy bond. Ist and IInd law of thermodynamics. |
| **CO2.**  | Understand the cellular organization of prokaryotes & eukaryotes and their macromolecules |
| **CO3**.  | Study the Structure, classification, physical and Chemical Properties of Carbohydrates, Lipids and proteins. |
| **CO4**.  | Study the Structure, types and functions of DNA & RNA. |
| **CO5**.  | Description of Enzymes: Classification, coenzymes, cofactor, isozymes. |
| **CO6**  | Study the Competitive, uncompetitive and noncompetitive inhibition. |

**CREDITS**- 3 **THEORY PERIODS OF EACH PAPER OF 45 MINUTES EACH PER WEEK OVER A SEMESTER**

 **6 PRACTICAL PERIODS OF 45 MINUTES EACH PER WEEK OVER A SEMESTER**

**B.Sc – Industrial Microbiology Ist year**

**Semester- II**

**Subject: Basic Microbial Techniques (Theory & Practical)**

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| **Co1** | Study the microscopes and its types. |
| **Co2** | Perform Calibration of ocular micrometer and microscopic enumeration of microorganism |
| **Co3** | Understand the principle of chromatography techniques such a liquid chromatography, paper chromatography and column chromatography |
| **Co4** | Understand the Gel electrophoresis and its applications. |
| **Co5** | Study the basis principle, working and application of Colorimetry, Spectrophotometry- Basic Principle, laws of absorption and absorption spectrum. |
| **Co6** | Examine theconcept of fermentation and its discovery cell reactor system, solid state fermentation reactors |
| **Co7** | Study the Fermentor and its types: Continuous, chemostat and fed batch. Immobilized |

 **Subject: Microbial physiology**

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| **Co**1.  | Recognize the growth pattern of microorganisms |
| **Co2**.  | Evaluate the impact of different environmental factors like pH, temperature and oxygen on the growth of microorganisms. |
| **Co3**.  | Explain the functions of cell membrane and several types of cellular transport system in bacteria. |
| **Co4.**. | Differentiate between the oxygenic photosynthetic and anoxygenic photosynthesis |
| **Co5**.  | Understand the role of photosynthetic pigments and the mechanism of photophosphorylation. |
| **Co6**.  | Accustom with the metabolic pathways such as glycolysis, ED pathway, Pentose phosphate pathway, fermentation processes etc. |

**CREDITS- 3 THEORY PERIODS OF EACH PAPER OF 45 MINUTES EACH PER WEEK OVER A SEMESTER**

 **6 PRACTICAL PERIODS OF 45 MINUTES EACH PER WEEK OVER A SEMESTER**