



## Content of the Course

### Theory

No. of Lectures (in hours per week): 2 Hrs. per week

Total No. of Lectures: 60 Hrs.

Part A Introduction			
Program: Diploma		Class: B.Sc.	Year: IV Semester
Session: 2025-2026			
Subject: INDUSTRIAL MICROBIOLOGY			
1	Course Code	S2INMB2T	
2	Course Title	Physiology and Biochemistry of Microbes	
3	Course Type (Core Course / Elective/ Generic Elective/ Vocational/.....)	Elective	
4	Pre-requisite (if any)	To study this course, a student must have had the subject Biology in class/ 12 <sup>th</sup> / certificate/.	
5	Course Learning Outcomes (CLO)	<p>On completion of this course:</p> <p>CO 1- The students will be able to demonstrate a knowledge and understanding of the basic. Principle of biochemistry including important molecules their economic and scientific importance inside the cell.</p> <p>CO 2-The students will be able to understand the biochemical pathways of synthesis and degradation of these molecules.</p> <p>CO 3-The students will be able to classify various types of enzymes and explain enzyme kinetics.</p> <p>CO 4- The students will be able to explain the transport of different metabolites generated, with application in industrial processes.</p> <p>CO 5- The students will have comprehensive knowledge of the microbial physiology and biochemistry.</p>	
6	Credit Value	03	
7	Total Marks	Max. Marks: 40+60	Min. Passing Marks:35

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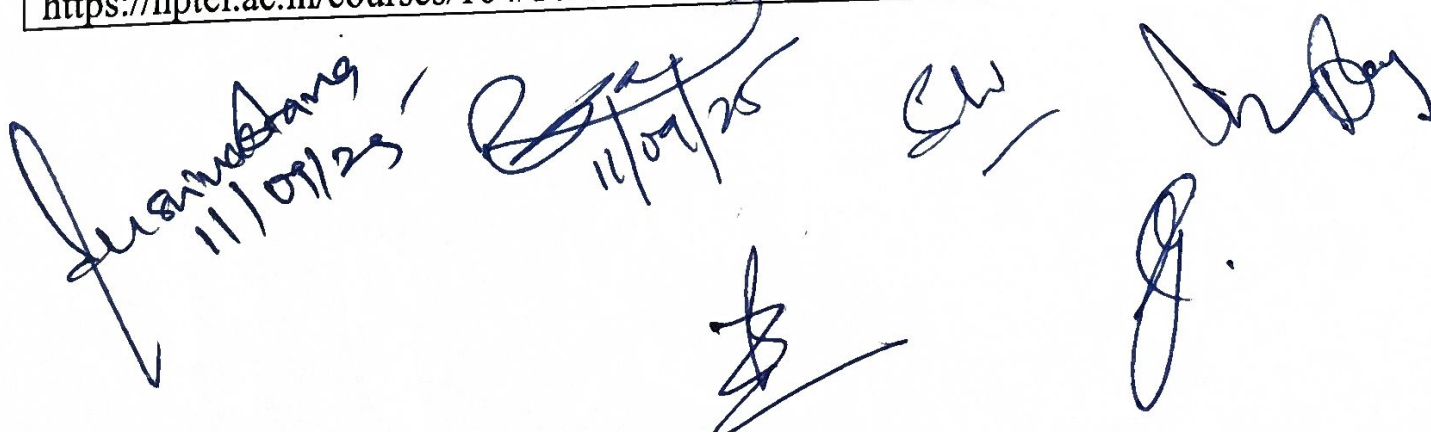


## Part B- Content of the Course

Total No. of Lectures - Tutorials-Practical (in hours per week):		
L-T-P:		No. of Lectures
Unit	Topics	
1	Biochemistry of Microbes: Chemical composition of cell, molecules of living systems, pH and pK, Buffers. Structure and classification of carbohydrates, lipids, proteins, DNA and RNA.	12
2	Enzymes and their classification, Enzyme kinetics, allosteric enzymes, Michaelis Menten equation, coenzyme, isozyme, enzyme inhibition and regulation. Vitamins: classification and function.	12
3	Microbial growth, phases of growth, conditions of growth, measurement of growth, growth curves, generation time, Effect of temperature, pH, salinity and oxygen on growth. Bacterial sporulation and germination, binary fission.	12
4	Biosynthesis of bacterial cell wall, Difference in eubacterial and archaebacterial cell wall, transport across membrane, Mechanism of flagellar and ciliary motion and its function. Physiological types of bacteria: Thermophiles, Halophiles, Acidophiles, Psychrophiles, Barophiles. Quorum sensing in bacteria	12
<b>Keywords/Tags: Microbial biochemistry, physiology.</b>		

## Part C-Learning Resources

Text Books, Reference Books, Other Resources
<b>Suggested Readings:</b> <ol style="list-style-type: none"> <li>1. Lehninger. Principles of Biochemistry, Nelson and Cox</li> <li>2. J. L. Jain. Biochemistry. S. Chand</li> <li>3. A. G. Moat, J. W. Foster and M. P. Spector. Microbial Physiology. Wiley.</li> <li>4. R. C. Dubey and D. K. Maheshwari. A Textbook of Microbiology. S. Chand</li> <li>5. Reddy S. R. and Reddy S. M. Microbial Physiology. Scientific Publishers India.</li> <li>6. Pelczar M. J., Chan E.C. S. and Krieg N. R. Microbiology. McGraw Hill Book Company</li> </ol>
<b>Suggested equivalent online courses:</b> <a href="https://nptel.ac.in/courses/104/102/104102016/">https://nptel.ac.in/courses/104/102/104102016/</a>


  
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### Part D-Assessment and Evaluation

#### Suggested Continuous Evaluation Methods:

Maximum Marks: 100

Continuous Comprehensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks

Internal Assessment: Continuous  
Comprehensive Evaluation (CCE):

Total Marks: 40

External Assessment:  
University Exam:

Total marks: 60

Any remarks/ suggestions:

**Note:** Please include the Tutorial related information (if any) in this format

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