Title of the Course: INDUSTRIAL MICROBIOLOGY [P]

Course Code: MIC-511

Number of Credits: 1, Practical

Contact hours: 30

Effective from Academic Year: 2022-23

Prerequisites	Basic knowledge about the types of microbes and their products of industrial relevance. Knowledge of microbial biochemistry, physiology, genetics and statistics.	
Objective:	Development of concepts in the processes, instruments, management, quality, etc.being used in the industries to produce the products using microorganisms.	
Content:		(30)
1.	Designing of fermentor – stirred tank reactor.	
2.	Fermentation kinetics – growth of *E.coli/S.cerevisiae* and determination of μ_{max}, Ks, Yx/s, m.	
3.	Rheology of substrate solutions.	
4.	Immobilization of microbial cells using alginate.	
5.	Baker's yeast – ISI/BSI quality assurance.	
Pedagogy:	Hands-on experiments in the laboratory, video, online data	
References/ Readings	Atkinson, B. and Mavituna, F., Biochemical Engineering and Biotechnology Handbook, Stockton Press. (1991) Demain, A. L., Davies, J. E. and Atlas, R. M. Manual of Industrial Microbiology and Biotechnology, ASM Press. (1999) Flickinger, M. C. and Drew S. W., The Encyclopedia of Bioprocess Technology: Fermentation, Biocatalysis and Bioseparation, Volumes 1 - 5, John Wiley Publisher. (1999) Stanbury, P. F., Whitaker, A. and Hall, S.J., Principles of Fermentation Technology, Butterworth-Heinemann Publishers. (2016) Vogel, H. C. and Tadaro, C. M., Fermentation and Biochemical Engineering Handbook: Principles, Process Design and Equipment, William Andrew Publisher. (2014)	
Course Outcomes	◆ Discuss management and controls on the microbial processes in research and industrial settings. ◆ Develop microbial processes in research and industrial settings. ◆ Connect physiological principles with the industrial processes. ◆ Evaluate quality of microbial product and process.	