

1.	Title of the course	Bioprocess Engineering
2.	Course number	CH318L
3.	Structure of credits (L-T-P-C)	3-0-0-3
4.	New course/modification to	Modified with CH404L/BIOPROCESS ENGINEERING
5.	To be offered by	Chemical Engineering
6.	Proposed by	S Uday Kumar
7.	Prerequisite	None
8.	<b>Course Objective(s):</b> To introduce concepts of enzyme kinetics, cell growth, reactor design and separations in bioprocesses.	
9.	<b>Course Content:</b> Introduction to bioprocesses; Metabolic stoichiometry and energetics; Enzyme kinetics; Inhibition of enzymatic reactions; Diffusion in bioprocess systems; Immobilization techniques; Introduction to bioreactors; Design and operation; Downstream processing for separation and purification; Microbial cell cultivation; Animal cell cultivation; Cell growth measurement and kinetics; Applications in food, pharmaceuticals and biofuels.	
10.	<b>Textbook(s):</b> 1. Belter P A, Cussler E L and Hu W S, Bioseparations Downstream Processing for Biotechnology, Wiley India (2011). 2. Shuler M L and Kargi F, Bioprocess Engineering Basic Concepts, 2nd Edition, Prentice Hall India (2002).	
11.	<b>Reference(s):</b> 1. Bailey J E and Ollis D F, Biochemical Engineering Fundamentals, 2nd Edition, Tata McGraw Hill (2010). 2. Lee J M, Biochemical Engineering, Prentice Hall (1992). 3. Palmer T and Bonner P, Enzymes: Biochemistry, Biotechnology, Clinical Chemistry, 2nd Edition, East West (2008).	