1.	Title of the course	Bioprocess Engineering
2.	Course number	CH4202
3.	Status of the course	Core
4.	Structure of credits	3-0-0-3
5.	Offered to	UG
6.	New course/modification to	New course
7.	To be offered by	Department of Chemical Engineering
8.	To take effect from	July 2020
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	**Course Objective(s):** To introduce concepts of enzyme kinetics, transport limitations, reactor design and separations in bioprocesses.	
12.	**Course Content:** Introduction to bioprocesses; Metabolic stoichiometry and energetics; Enzyme kinetics; Inhibition of enzymatic reactions; Transport phenomena in bioprocess systems; Immobilization techniques; Industrial application of enzymes for conversion of carbohydrates, starch and cellulose; Microbial cell cultivation; Animal cell cultivation; Plant cell cultivation; Cell growth and measurement; Introduction to bioreactor design; Sterilization; Downstream processing for separation and purification.	
13.	**Textbook(s):** 1. Belter P A, Cussler E L and Hu W-S, *Bioseparations: Downstream Processing for Biotechnology*, 1st Edition, Wiley India (2011). 2. Shuler M L and Kargi F, *Bioprocess Engineering – Basic Concepts*, 2nd Edition, Prentice Hall India (2002).	
14.	**Reference(s):** 1. Bailey J E and Ollis D F, *Biochemical Engineering Fundamentals*, 2nd Edition, Tata McGraw Hill (2010). 2. Lee J M, *Biochemical Engineering*, 1st Edition, Prentice Hall (1992).	