Second Semester

Details of course: - Biochemical Engineering Principles Interdisciplinary course 3 (BT 102)

Course Title	Course Structure			Pre-Requisite
	L	T	P	
Biochemical Engineering Principles (BT 102)	3	1	0	Nil

Course Objective: To introduce the key aspects associated with biochemical processes and calculation techniques used in reactor designing and to acquaint the students with fundamentals of the different reaction systems.

Course Outcome (CO):

1. Understand the Microbial Process Principles such as Microbial growth curve and biomass yield. Compare and Contrast the Energetics of the cells.

2. Analyse the Mathematical modelling and kinetics of microbial growth such as Substrate utilization, Product formation and Plasmid Instability.

3. Identify the Sterilization Principles and mechanism of media, air sterilization along with thermal death kinetics of microorganism.

4. Distinguish the different types of Bioreactor, its design and working conditions, and understand the homogeneous and heterogeneous reaction system.

5. Understand the Instrumentation and Control of Biochemical process variables, their measurements, control principles and their application in bioreactors.

S.No	Content	Contact Hours
Unit 1	Microbial Process Principles: Microbial growth; Synchronous culture, Biomass yield; Energetics of the cells.	8
Unit 2	Kinetics of Microbial Growth, Substrate Utilization and Product Formation: Mathematical modelling of microbial growth; Substrate utilization and product formation kinetics; plasmid Instability.	9
Unit 3	Sterilization: Principles and mechanism of media sterilization. Thermal death kinetics, Air sterilization.	8
Unit 4	Bioreactor Design and Analysis: Bioreactor configuration, Bioreactor design and optimum operations, Basic concept of scale-up of bioreactors, Introduction to design of homogeneous & heterogeneous reaction system.	9
Unit 5	Instrumentation and Control: Biochemical process variables and their measurements, Control principles and their application in bioreactors.	8
	Total	42