Biochemical Engineering - Video course

COURSE OUTLINE

1. Basics of Biology, Overview of Biotechnology, Diversity in Microbial Cells, Cell Constituents, Chemicals for Life.
2. Kinetics of Enzyme Catalysis.
3. Immobilized Enzymes: effects of intra and inter-phase mass transfer on enzyme kinetics.
4. Major Metabolic Pathways: Bioenergetics, Glucose Metabolism, Biosynthesis.
5. Microbial Growth: Continuum and Stochastic Models.
6. Design, Analysis and Stability of Bioreactors.
7. Kinetics of Receptor-Ligand Binding.
8. Receptor-mediated Endocytosis.
9. Multiple Interacting Microbial Population: Prey-Predator Models.
10. Bio-product Recovery & Bio-separations, Manufacture of Biochemical Products.

COURSE DETAIL

S.No	Topics	No. of Lectures
1	Basics of Biology; Overview of Biotechnology; Diversity in Microbial Cells, Cell Constituents, Chemicals for Life **(Dr. Rintu Banerjee).**	7
2	Kinetics of Enzyme Catalysis **(Dr. Saikat**	5

NP-TEL

NPTEL

http://nptel.iitm.ac.in

Chemical Engineering

Pre-requisites:

1. Transport Phenomena (UG level).
2. Chemical Reaction Engineering (UG level).

Additional Reading:

1. Transport Phenomena in Biological Systems by G. A. Truskey, F. Yuan, D. F. Katz, Pearson Prentice Hall, 2004.

Coordinators:

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	Chakraborty).	
3	Immobilized Enzymes: effects of intra and inter-phase mass transfer on enzyme kinetics **(Dr. Saikat Chakraborty)**.	5
4	Major Metabolic Pathways: Bioenergetics, Glucose Metabolism, Biosynthesis **(Dr. Rintu Banerjee)**.	5
5	Microbial Growth: Continuum and Stochastic Models **(Dr. Saikat Chakraborty)**.	3
6	Design, Analysis and Stability of Bioreactors **(Dr. Saikat Chakraborty)**.	4
7	Kinetics of Receptor-Ligand Binding **(Dr. Saikat Chakraborty)**.	3
8	Receptor-mediated Endocytosis **(Dr. Saikat Chakraborty)**.	3
9	Multiple Interacting Microbial Population: Prey-Predator Models **(Dr. Saikat Chakraborty)**.	1
10	Bio-product Recovery & Bio-separations; Manufacture of Biochemical Products **(Dr. Rintu Banerjee)**.	4

Total: Prof. Saikat Chakraborty (24 lectures), Prof. Dr. Rintu Banerjee (16 lectures)

References:

1. Biochemical Engineering Fundamentals by J. E. Bailey & D. F. Ollis, McGraw Hill Book Company, 1986.
2. Biochemical Engineering by H. W. Blanch & D. S. Clark, Marcel Dekker, Inc., 1997.
3. Bioprocess Engineering (Basic Concepts) by M. L. Shuler

& F. Kargi, Prentice Hall of India, 2003.