

Northeastern University, Chemical Engineering Department
CHE U630 Biochemical Engineering Fundamentals

Instructor: Prof. Carolyn Lee-Parsons

Spring 2004 Course Syllabus

Wk #	Lecture #	Date	Lecture Topic	Read	HW Assignment
1	1	7-Jan Wed	Introduction to Course; Syllabus, Policies		Assign Project 1 & 2
2	2	12-Jan Mon	Overview of Biological Basics: Chapter 2 Cell Classification / Infrastructure: Prokaryotes vs Eucaryotes	Ch 1, 2.1	
	3	14-Jan Wed	Cell Construction / Cell Culture Nutrient Requirements	2.2 - 2.4	
3	4	21-Jan Wed	Enzymes: Chapter 3 Mechanism of Action / Deriving Enzyme Kinetic Models Effect of Enzyme Inhibitors, Temperature, & pH on Kinetics	3.1 - 3.3	Begin HW #1
4	5	26-Jan Mon	Immobilized Enzyme System: Diffusion effects in surface-bound enzymes on non-porous supports	3.4	Project # 1 Due
	6	28-Jan Wed	Immobilized Enzyme System: Diffusion effects in enzymes immobilized in a porous matrix	3.5 - 3.7	HW # 1 Due Begin HW #2
5	7	2-Feb Mon	How Cells Work: Chapter 4 Replication, Transcription, Translation, Post-Translation Regulation at the Genetic and Metabolic Level	4.1 - 4.9 4.7 (Skim)	
	8	4-Feb Wed	Major Metabolic Pathways: Chapter 5 Overview of Bioenergetics and Major Metabolic Pathways	Ch 5	
6	9	9-Feb Mon	Special Lecture: Understanding Cellular Machinery through Genomics & Proteomics	Handouts	HW #2 Due
	10	11-Feb Wed	How Cellular Information is Altered: Chapter 8 Gene Transfer / Genetic Engineering	Ch 8	
7	11	18-Feb Wed	Special Lecture: Drug Discovery Process	Handouts	
8	12	23-Feb Mon	Review & Prepare for Midterm Exam: Review HW #1 & #2		
	13	25-Feb Wed	Midterm Exam, In-class		Exam
9	14	8-Mar Mon	Review Midterm Exam How Cells Grow: Chapter 6 Methods for Quantifying Growth / Typical Batch Growth Curve Growth Parameters: Specific Growth Rate & Yield Coefficients	6.1 - 6.2	Begin HW #3
	15	10-Mar Wed	Growth Kinetic Models	6.3.1 - 6.3.2.2 6.3.2.3-6.3.4 (Skim)	Project #2 Due
10	16	15-Mar Mon	Continuous System	6.4 - 6.5	HW #3 Due Begin HW #4
	17	17-Mar Wed	Operating Considerations for Bioreactors: Chapter 9 Batch vs Continuous Process / Chemostat with Recycle	9.1 - 9.3.1	
11	18	22-Mar Mon	Multi-stage Chemostat	9.3.2	HW #4 Due Begin HW #5
	19	24-Mar Wed	Fed-Batch Operation / Perfusion Review HW #3 & #4	9.3.3 - 9.3.4	
12	20	29-Mar Mon	Selection, Scale-up, Operation of Bioreactors: Chapter 10 Overview of Reactor Types / Aeration & Agitation	10.1 - 10.2.3	HW #5 Due
	21	31-Mar Wed	Scale-up Considerations	10.2.4 - 10.2.5	Begin HW #6
13	22	5-Apr Mon	Bioreactor Instrumentation / Sterilization of Process Fluids	10.3-10.5	
	23	7-Apr Wed	Recovery and Purification of Products: Chapter 11 Separation of Insoluble Products / Cell Disruption	11.1-11.3	HW #6 Due
14	24	12-Apr Mon	Separation of Soluble Products	11.4-11.7	
	25	14-Apr Wed	Course Evaluation / Course Summary Review & Preparation for Final: Review HW #5 & 6		
		16-23 Apr	Final Exam		

