

Instructor

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References

- *Belter, P., Cussler, E.L. and Hu, W.-S., *Bioseparations: Downstream Processing for Biotechnology*, 1988 (John Wiley and Sons)
- *Doran, Pauline M., *Bioprocess Engineering Principles*, 2005 (Academic Press)
- Ladisch, M.R. *Bioseparation Engineering*, 2001 (John Wiley & Sons)
- Wang, D.I.C. et al., *Fermentation and Enzyme Technology*, 1979 (John Wiley and Sons)

Textbook

There is no assigned text book for this course. Lecture notes and readings, however, will be posted on WebCT. A binder with the assigned readings is available for check out in Amundson 257.

Objective of this Course

Upon completion of this course students are expected to understand the characteristics of biochemical processes and to be able to apply engineering principles to analyze biochemical processes.

Assignments

Students are required to attend lectures and read assigned text and periodical selections. There will be seven homework assignments. No late homework will be graded unless approved prior to the office dates. You must turn in at least 70% of the homework assignments in order to receive a passing grade. There will be two one-hour exams and a design project in addition to a two-hour final exam. Homework assignments will be due one week after they are handed out.

Date	Topics	Readings	Instructor
09/09 W	1: Overview of Biotechnology	D pp. 1-7	FS
09/11 F	2: Micro-organisms, Plant and Animal cells, and Stem Cells	D pp. 22-23, 51-62, 74-80	FS
09/14 M	3: Stoichiometry and Kinetics of Growth and Production	D pp. 265-276, 295	FS
09/16 W	3: Stoichiometry and Kinetics of Growth and Production (cont'd)		FS
09/18 F	4: Modeling of Biological Systems	Handout	FS
09/21 M	4: Modeling of Biological Systems (cont'd)		FS
09/23 W	5: Continuous Culture	D pp. 55-72	FS
09/25 F	5: Continuous Culture (cont'd)		FS
09/28 M	4: Modeling of Biological Systems (cont'd)		FS
09/30 W	6: Residence Time Distribution and Bioreactor Kinetics	Handout	FS
10/02 F	6: Residence Time Distribution and Bioreactor Kinetics (cont'd)		FS
10/05 M	7: Overview of Bioreactors	D pp. 333-340	FS
10/07 W	8: Mixing and Mass Transfer		FS
10/09 F	8: Mixing and Mass Transfer (cont'd)		FS
10/12 M	Exam 1		
10/14 W	9: Scale up and Scale-down		FS
10/16 F	9: Scale-up and Scale-down (cont'd)		FS
10/19 M	10: Biofuels		FS
10/21 W	10: Biofuels (cont'd)		FS
10/23 F	10: Biofuels (cont'd)		FS
10/26 M	11: Biocatalysis		WSH
10/28 W	11: Biocatalysis (cont'd)		WSH
10/30 F	11: Biocatalysis (cont'd)		WSH
11/02 M	12: Stem Cell		WSH
11/04 W	12: Stem Cell (cont'd)		WSH
11/06 F	13: Cell Culture Processes		WSH
11/09 M	13: Cell Culture Processes (cont'd)		WSH
11/11 W	Exam 2		
11/13 F	14: Introduction to Bioseparations	BCH Chap 1	WSH
11/16 M	15: Solid Removal Operations	BCH Chap 2, 3	WSH
11/18 W	16: Membrane Processes	BCH Chap 9	WSH
11/20 F	16: Membrane Processes (cont'd)		WSH
11/23 M	17: Adsorption	BCH Chap 6	WSH
11/25 W	17: Adsorption (cont'd)		WSH
11/27 F	Holiday		
11/30 M	17: Adsorption (cont'd)		WSH
12/02 W	17: Adsorption (cont'd)		WSH
12/04 F	18: Elution Chromatography	BCH Chap 7	WSH
12/07 M	18: Elution Chromatography (cont'd)		WSH

12/09 W	18: Elution Chromatography (cont'd)	WSH
12/11 F	18: Elution Chromatography (cont'd)	WSH
12/14 M	Case study	WSH
12/16 W	Case study	WSH
12/22	Final exam 8-10:00 a.m.	