

**BE 3340: Process Design in Biological Engineering
Spring 2009 Syllabus**

Meeting Schedule: Lecture 9:40-10:30 am Tuesday/Thursday 213 Tureaud Hall
Lab 1:40-4:30 Monday 213 Tureaud Hall

Text Books: Seider, W. D., Seader, J. D., and D. R. Lewin. Product and process design principles. John Wiley and Sons, Inc., New York, NY.

Belter, P.A., E.L. Cussler, and W.S. Hu. 1988. Bioseparations. Downstream processing for biotechnology. John Wiley & Sons. New York, NY.

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Phone: 578-2919 Office Hours: TH 10:30-11:30 (or by appointment)
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M: 8:30 – 9:30 (or by appointment)

Teaching Assistant: Ammar Qureshi, E-mail: aqures1@lsu.edu, Office Hours: TBA

Final Exam Date: Wednesday, May 6, 10:00 – NOON

Course Objectives:

After completing this course, you should be able to:

1. Define process design and its role in Biological Engineering
2. Describe the impact of various factors on the design of a bioprocess
3. Use available models to analyze and design partial or full bioprocesses
4. Construct and evaluate potential process designs for a given situation

Course Policies

- You will work on the **project** in groups. Each group will have the opportunity to present their work in front of the class twice, mid-semester and at the end of the semester.
- **Examinations** and **labs** missed due to an unexcused absence cannot be made up and a grade zero will be given for each one missed.
- Any student requiring **special arrangements** for taking exams, taking-notes and other special arrangements please see or contact the instructor within the first two weeks of class.

Academic Integrity

Students are expected to comply with the Code of Student Conduct throughout this course. For your information, the Code of Student Conduct can be found at [http://appl003.lsu.edu/slas/dos.nsf/\\$Content/Code+of+Conduct?OpenDocument](http://appl003.lsu.edu/slas/dos.nsf/$Content/Code+of+Conduct?OpenDocument)

Grading policy: Grades will be determined based on the following break down:

Exams (3) 15% each, Homeworks 10%, Quizzes 10%, Lab reports 10%, Design Project 25%.

Grade Assignments: A (> 90), B (80-89.9), C (70-79.9), D (60-69.9), F (<60)

LECTURE SCHEDULE (tentative)

Date	Topic	
January	13	Introduction to the course
	15	Overview of bioprocess engineering
	19	<i>No Lab (Martin Luther King Day)</i>
	20	Lecture dedicated to project
	22	Heuristics for process synthesis
	26	<i>Lab 1. An exercise on mathematical treatments</i>
	27	Separation methods-introduction
	29	Filtration
February	2	<i>Lab 2. Library visit</i>
	3	Filtration
	5	Centrifugation
	9	<i>Lab 3. Tour of dairy facility (field trip)</i>
	11	Centrifugation
	12	Cell disruption
	16	<i>Lab 4. Yogurt production</i>
	17	Extraction
	19	Extraction
	23	<i>Mardi Gras – No Class</i>
	24	<i>Mardi Gras – No Class</i>
26	Review	
March	2	<i>Lab 5. EXAM I</i>
	3	Adsorption
	5	Chromatography
	9	<i>Lab 5. Mid-semester presentations</i>
	10	Chromatography
	12	Chromatography
	16	<i>Lab 7. Extraction and separation of isoflavones</i>
	17	Lecture dedicated to project
	19	Precipitation
	23	<i>Lab 8. Visit chemical company (field trip)</i>
	24	Precipitation
	26	Crystallization
	30	<i>Lab 9. Pumps</i>
31	Process simulation using SuperPro	
April	2	Drying
	6	<i>Spring Break – No Class</i>
	7	<i>Spring Break – No Class</i>
	9	<i>Spring Break – No Class</i>
	13	<i>Lab 10. Lab dedicated to project (SuperPro)</i>
	14	Review
	16	EXAM II
	20	<i>Lab 11. Lab dedicated to project (SuperPro)</i>
	21	Heat exchangers
	23	Heat exchangers
	27	<i>Lab 12. Project presentations (SuperPro)</i>
28	Economic analysis	
30	Review (PROJECT DUE)	
May	6	FINAL EXAM 10am-noon