BE 4340: Food and Bioprocess Engineering
Spring 2007 Syllabus

Meeting Schedule: Lecture 10:40-11:30 am Monday/Wednesday 115 E. B. Doran Bldg.
Lab 1:40-4:30 Tuesday 140 Ag Metal Bldg.

Text Books: Geankoplis, C. J. Transport Processes and Unit Operations. Third Edition. Prentice Hall, Englewood Cliffs, NJ. 1993.

Singh, R. P. and D. R. Heldman. Introduction to food engineering Third Edition. Academic Press. Orlando, Fl. 2001.

Smith, P. G. Introduction to Food Process Engineering. Kluwer Academic, New York, NY. 2003.

Instructor: Dorin Boldor
E-mail: dboldor@lsu.edu
111 EB Doran Bldg.
Office Hours: M: 1:30 – 2:30
W: 11:40 – 12:30

Teaching Assistant:
Nicholas Gerbo
102A Ag Metals Bldg.
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Office Hours: M: 8:40-10:30

Course Objectives:
The course covers the application of laws of conservation of mass and energy to various bioprocesses. The four major preservation methods (evaporation, refrigeration, freezing, and dehydration) will be presented and discussed. The specific objectives of the course are to:

1. Apply the laws of conservation of mass and energy to various bioprocesses
2. Evaluate the effectiveness of different types of heat exchangers
3. Compute the heating requirements in single and multiple-effect evaporators
4. Compute refrigerant requirements for freezing and storage (using pressure-enthalpy tables)
5. Predict freezing times of products with simple geometrical shapes
6. Use a psychrometric chart in designing and evaluating drying and evaporation processes
7. Predict drying times during food dehydration

Web Page
A course web page will be made available through LSU's Blackboard to enhance the course contents. Students are requested to visit this web site on a regular basis. The course web site contains the course syllabus, the lecture schedule, lecture notes, and review materials. Class notes will be posted on-line before each lecture.

Course Policies

- Each student will undertake an individual project, consisting of a review of a paper and the design, preparation, and completion of a laboratory. Each student will have the opportunity to present their project results in front of the class at the end of the semester.
- Working individually on the homework is strongly encouraged. Homework is due at the beginning of class on the due date. Homework assignments turned in late will not be accepted and will be assigned a grade of zero.
- **Exams** will be divided into open book and closed book sections.
- **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 and Academic Misconduct

Students are expected to comply with the Code of Student Conduct at all times 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

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

Exam 1	20 %
Exam 2	25 %
Final exam	20 %
Homework	20 %
Design Project Report and presentation	15 %

Grade Assignments:

A:	> 90	B:	80-89.9		
C:	70-79.9	D:	60-69.9	F:	< 60

Topics:

1. Evaporation (5 lectures)

Boiling point elevation, types of evaporators, design of a single-effect evaporator and a multiple-effect evaporator, vapor recompression systems.

2. Refrigeration (4 lectures)

Selection of a refrigerant, pressure-enthalpy charts, components of a refrigeration system, mathematical expressions useful in analysis of vapor-compression refrigeration.

3. Freezing (5 lectures)

Freezing systems, frozen food properties, freezing time.

4. Dehydration (6 lectures)

Psychrometrics, basic drying processes, dehydration systems, dehydration system design, drying time predictions.

LECTURE SCHEDULE (tentative):

Week of		Topic
January	17	Introduction to the course
	22	Evaporation
	23 Lab	***Lab: Safety in a Processing Lab***
	29	Evaporation
	30 Lab	***Evaporation***
February	5	Evaporation and Refrigeration (1 lecture each) – guest lecturer
	6 Lab	***Evaporation and Problem Session***
	12	Refrigeration
	13 Lab	***Refrigeration***
	19	MARDI GRAS holiday, no classes, no lab
	26	Refrigeration and Freezing (1 lecture each)
	27 Lab	***Refrigeration and Problem Session***
March	5	Review (on 5th) and Exam I (on 7th)
	6 Lab	***Freezing***
	12	Freezing
	13 Lab	***Freezing and Problem Session***
	19	Freezing
	20 Lab	***Field Trip***
	26	Dehydration
	27 Lab	***Dehydration***
April	2	SPRING BREAK, no classes, no lab
	9	Dehydration
	10 Lab	***Dehydration and Problem Session***
	16	Dehydration
	17 Lab	***Paper Presentations***
	23	Review (on 23rd) and Exam II (on 25th)
	30	Review for Final
May	***1 Lab***	***Design presentations***
	2	***TBA***