FSHN 460 Food Processing Operations (3 credits)

Instructor: Soojin Jun
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Course description: Principles and applications of food dehydration, thermal processing, low temperature preservation, chemical and biochemical preservation, irradiation, packaging, manufacturing, plant sanitation, water and waste management.

Course objectives: Students will be able to

1. Define and explain the basic engineering concepts and unit operations used in food processing
2. Develop the food processing system optimized for food applications
3. Understand and identify food processing methods suitable for user's purpose

Course policies:

1. Attendance is expected, not required and will not influence course grade.
2. All graded assignments, quizzes, and exams will be returned to students.
3. The course is graded on an absolute grading policy.
4. **Homework:** Homework must be turned in at class by a due date. Late homework will receive a 15% penalty per day. Each assignment will be equally weighed throughout the semester.
5. **Quizzes:** In-class quizzes (typically 15 minutes) will be one problem or several conceptual questions given at the beginning of the lecture. The material covered on the quiz will come from the previous lectures, homework. The quiz will be closed books and notes. No make-up quizzes will be given.
6. **Exams:** Two exams will be given during the semester. The exams will be both closed and open books and notes. No make-up exams will be given.

Course Prerequisites: FSHN 403, FSHN 430 / Instructor Approval

Academic integrity:

"Professional conduct, especially with regard to honesty and integrity, is a lifetime

requirement for those pursuing an engineering career."

Text: No Textbook required

References:

R. Paul Singh, Dennis R. Heldman, 2000, Introduction of Food Engineering, 3rd edition, Academic Press Inc.

Christie J. Geankoplis, 1978, Transport Processes and Unit Operations, Allyn and Bacon, Inc.

Romeo T. Toledo, 1991, Fundamentals of Food Process Engineering, 2nd edition, Van Nostrand Reinhold

Fellows, P.J. 2000.Food Processing Technology: Principles and Practice, 2nd edition, CRC Press.

Grade basis and scale:

Homework (6)	90 pts
Midterm exam	120 pts
Final exam	160 pts
Quiz	40 pts
Total	410 pts

A+	> 93%	C+	74 – 76.9%
A	90 – 93%	C	70 – 73.9%
A-	87 – 89.9%	C-	67 – 69.9%
B+	84 – 86.9%	D	60 – 63.9%
B	80 – 83.9%	F	< 60%
B-	77 – 79.9%		

Course plan:

Weeks	Topic
1	Introduction to food processing, format and scope of course, course expectations
2	Properties and theory
3	Ambient temperature processing Material preparation, size deduction, mixing, separation
4	Ambient temperature processing Fermentation and enzyme, irradiation
5	Heat processing
6	Evaporation and extrusion
7	Food dehydration
8	Baking, roasting, frying
9	**Midterm Exam**
10	Dielectric, ohmic and infrared heating

11	Freezing, freeze drying and concentration
12	Packaging – filling and sealing
13	Retort packaging
14	HACCP
15	Alternative food processing techniques
16	Wrap up and **Final Exam**