Course Syllabus

1. Name of Curriculum Bachelor of Science (Food Science and Technology), Mahidol University International College

2. Course Code ICFS 425 **Course Title** Cereal Science and Technology

3. Number of Credits 4 (3-2) (Lecture-Lab)

4. Prerequisites ICFS 313, ICFS 316 or approval of instructor

5. Type of Course Elective for Food Science and Technology students

6. Semester/ Academic Year 3rd trimester/ 2004

7. Course Description

The structure, composition and utilization of rice, wheat and other cereal grains for the production of starches, flours, milling by-products, and cereal-based human food products; cereal processing technologies such as dry and wet milling, baking, extrusion cooking, breakfast cereals and noodle and pasta manufacturing; the Quality/Sanitary Control and Quality Assurance aspects of production; practical exercises.

8. Course Objectives

Upon completion of this course, the student should be able to:

1. Identify the different cereal grains produced and used worldwide for the production of human foods with special emphasis on cereal grains produced/ utilized extensively in Thailand and other parts of Asia (eg. Rice and wheat).
2. Characterize the chemical composition of edible cereal grains in relation to nutritional values and functional properties.
3. Understand the theory of stroage of cereal grains in relation to maintaining grain quality and maximizing profits.
4. Understand the processes of dry and wet milling and recognize the end-products of these process an the use of these products in manufacturing human foods.
5. Understand properties of ingredients used in baking of breads and reactions of these ingredients during processing into baked products.
6. Classify and understand theingredients and processes used for manufacturing of today's cereal grain-based food products (other than breads) such as cookies, cakes, ready-to-eat and hot breakfast cereals, pasta, noodles, flat breads, cereal-based snacks such as corn chips, crackers, pretzels, etc.

9. Course Outline

Week	Topics				Instructors
	Lecture	Hour	Lab	Hour	
1	Introduction to Cereal Science; World Cereal Production and Utilization	4	-	-	Dr. Kohnhorst
2	Structure of Cereals: cereal starch, and protein	3	Determination of starch, protein, oil, beta-glucan and amylose contents; dietary fiber- What is it? How it is determined?	4	Mike Johns
3	Storage of Cereal and Cereal Products; Dry Milling of Cereals	3	Dry milling of bread wheat; Yeast-raised bread making technology	4	Dr. Kohnhorst
4	Baking (Yeast-Leavened Products and Soft Wheat Products)	3	Pasta and Noodle Processing-Science, Technology and Product quality	4	Dr. Kohnhorst
5	Midterm examination	2			
6 – 7	Rice Processing	6	Processing of Rice and rice products	4	Dr. Kohnhorst
8	Pasta and Noodle Products	3	Snack Processing Science, Technology and Product quality-pretzels, doughnuts	4	Dr. Kohnhorst
9	Wet Milling, Starch and Sweetener	4			Dr. Kohnhorst
10	Cereal-Based Snack Foods	4			Dr. Kohnhorst
11	Cereal Breakfast Foods	4			Dr. Kohnhorst
	Total	**34**		**20**	

10. Teaching Methods

a. Lectures
b. Practical laboratory exercises
c. Visitations to cereal processing industries
d. Guest lecturers (or speakers)

11. Teaching Media

a. Powerpoint presentation
b. Laboratory equipment and exercises
c. handouts

12. Course Achievement

Assessment made from the stated criteria: students receiving more than 90% of the points and up will receive Grade A.

13. Course Evaluation

1. Mid-term examination	30%
2. Final examination	30%
3. Laboratory exercises	30%
4. Class Participation/attendance	10%
Total	100%

14. References

1. Hoseney, R. Carl. "Principles of Cereal Science and Technology" 2nd edition by. ISBN: 0-913250-44-9
2. Owens, Gavin, ed. 2001. Cereals Processing Technology. CRC Press. ISBN: 1-95573-561 X.

15. Instructor

Mike Johns

16. Course Coordinator

Dr. Andrew Kohnhorst