



Isfahan University of Technology
College of Agriculture
Department of Food Science

Course name:	Cereal Science and Technology (BSc program)
Prerequisite:	Food Chemistry
Lecturer:	Dr. Mahdi Kadivar
Lab Assistant:	F. Nazeri
Class/Time:	Saturdays 13:30-15:30, Classroom no. 10
Lab/Time:	Wednesdays, 8-10 and 10-12, Technology lab.
Troubleshooting hours:	Saturdays 10-12

Reference Book: Hosney R.C., *Principals of Cereal Science & Technology 1996, AACC St. Paul, MN.*

Theory:

Introduction of different cereal grains, Nutritional importance of the grains. Production and consumption of cereal grains in Iran and the world, classifications, evaluation criteria and factors affecting physical and chemical quality of grains, seed structure, chemical composition of the seed including their proteins, enzymes, starch (pasting and gelatinization characteristics), non-starch polysaccharides, their roles in dough and final products, storage of cereal grains, milling process and flour production, factors influencing flour quality, flour grading, application of additives in bakery products (emulsifiers, enzymes, oxidoreductants, bleachers), dough rheology and corresponding instruments, instrumental evaluation of flour and dough (farinograph, extensigraph, alveograph, falling number). Raw ingredients for making bread, changes occur in dough during baking, preparation of bread dough using batch or continuous processes, bread dough improvers and functional ingredients, dough mixing, fermentation, baking, methods used for preparation of dough and bread, different types of breads, bread evaluation, bread staling. Seed structure of rice, barley, corn, oat, sorghum, millet and their importance, varieties and chemical composition, paddy; drying and storage, milling technology, parboiling, evaluation criteria of rice quality, rice byproducts; bran and oil, malting process of barley and malt beverage, its non-malty application in foods. Corn, and oat processes. Pasta-making technology, production of biscuits, cracker, cake, cookies and their quality control. Snack food production

Laboratory:

Getting familiar with cereal grains, *Besatz* (grain *besatz* or *Kornbesatz*, and black *besatz* or *Schwarzbesatz*), hectoliter weight, one thousands kernel weight, chemical analysis of wheat i.e. crude protein, wet and dry gluten content, moisture, ash, Zeleny sedimentation test, Osborne fractionation of wheat protein (based on fraction solubility in water, saline, alcohol and acidic/alkali solutions), particle size determination of flour and semolina, acid value determination, determination of carotenoids (pigments) in flour and semolina, alpha amylase determination using falling number method, rheological evaluation of the dough using farinograph, extensigraph, alveograph, baking bread, biscuit and cake, visit of grain elevators, mills, bread and other bakery products factories, visit of rice dry-millers, visit malt beverage producers.

Course assessments (scores):

Lab: 6

Midterm: 4

Quizzes (two): 2

Final: 8