

**Study Plan**  
**Faculty of Agriculture**  
**MASTER in Food Science and Technology**  
**(Thesis Track)**

**First: GENERAL RULES & CONDITIONS:**

Plan Number			2013
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1. This plan confirms to the valid regulations of programs of graduate studies.
2. Specialties of Admission:
  - The First priority: Bachelor's of Food Science and Technology.
  - The Second priority: Bachelor's of Nutrition and Food Technology
  - The Third priority: Bachelor's of Human Nutrition and dietetics
  - The Fourth priority: Bachelor's of Biology, Biochemistry, Chemical Engineering, Industrial Engineering, Veterinary Medicine, Animal Production and Chemistry
3. Admission policies: The First policy.

**Second: SPECIAL CONDITIONS:** None.

**Third: STUDY PLAN: Studying (33) Credit hours as follows:**

**1. Obligatory Courses : Studying (15) credit hours successfully:**

Course No.	Course Title	Credit Hours	Theory	Prac.	Prerequisite
0601701	Experimental Design and Analysis	3	3	-	
0603711	Advanced Food Science	3	3	-	
0603721	Advanced Food Chemistry	3	3	-	
0603722	Food Microbiology	3	3	-	
0603781	Advanced Laboratory Techniques in Food and Nutrition	2	-	2	
0603792	Seminar in Food Science	1	1	-	

**2. Elective Courses: Studying (9) Credit hours successfully from the following:**

Course No.	Course Title	Credit Hours	Theory	Prac.	Prerequisite
0603712	Food Packaging	3	3	-	
0603720	Food Mycology	3	3	-	
0603724	Applications of Molecular Biology in Foods	3	3	-	
0603726	Cereal Chemistry	3	3	-	
0603728	Dairy Science	3	3	-	
0603729	Fruit and Vegetable Technology	3	3	-	
0603751	Advanced Nutritional Biochemistry	3	3	-	
0603764	Nutrition and Exercise	3	3	-	

**3. Thesis: (9) Credit hours # (0603799).**

**Course Description**  
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**(0601701) Experimental Design and Analysis (3 Credit Hours)**

This course covers linear and multiple regression and correlation, analysis of variance and basic experimental design analysis. Mean separation procedures, Duncan's Multiple Range Test (DMRT), Turkey's W. procedure, Least Significant Difference (LSD), and Orthogonal contrasts. Students will be exposed to the uses of PC in experimental design and analysis.

**(0603711) Advanced Food Science (3 Credit Hours)**

This course deals with recent advances in the modern food processing techniques, as well as the new developments in the production of the various food products with focus on physical and chemical principles; the scientific basis of some concepts related to food processing like shelf life, accelerated storage, biosensors and modeling are also discussed.

**(0603712) Food packaging (3 Credit Hours)**

This course deals with review of packaging materials regarding permeability and migration aspects; stability of packaging materials; packaging and marketing; development and design of food packages; filling and packaging principles and machinery; aseptic filling; modified and controlled atmospheric packaging. Packaging of food types such as: meat and fish, fresh fruits and vegetables, frozen and dried foods.

**(0603720) Food Mycology (3 Credit Hours)**

This course deals with classification of fungi (molds and yeasts) important in food; morphological, cultural fermentation and other properties of fungi important in food; factors affecting growth of fungi in food; roles of fungi in the spoilage of fresh and preserved food; fungi important in fermentation and other food biotechnology; mycotoxins in food.

**(0603721) Advanced Food Chemistry (3 Credit Hours)**

This course deals with the physical and chemical properties of water and its influence on the microbial and chemical deteriorations; the functional properties of proteins and their interactions with carbohydrates and fats; the changes that occur in fats and oils during processing and storage and their effect on food quality and structure, physiochemical properties, methods of extraction and purification and the factors that affect the stability of natural colors and flavors.

**(0603722) Food Microbiology (3 Credit Hours)**

This course deals with the microbial ecology of foods and its application in food preservation and safety, and the microbial injury and its effect on survival and recovery; the emerging food-borne pathogens, microbiology of some traditional foods and its effect on the quality safety of the products, and sampling plans for the microbiological analysis of foods, as well as the principles and application of the hazard analysis critical control point (HACCP) system to ensure food safety.

**(0603724) Applications of Molecular Biology in Foods (3 Credit Hours)**

This course deals with the principles of the techniques used in molecular biology as applied to food technology including PCR, genetic modification and DNA sequencing. Application and analysis of foods is also discussed.

**(0603726) Cereal Chemistry (3 Credit Hours)**

This course deals in depth the chemical, physical and functional characteristics of the cereal and legume constituents with emphasis on wheat; biosynthesis and development of such functional characteristics in the grain during maturity, as well as their effects on some properties like hardness, and milling behavior; important phenomena as retro gradation, swelling, and gelatinization in relation to bread staling and extrusion; the amino acid analysis and protein fractionation techniques and profiles of cereals and legumes relating them to their rheological, nutritional and biological properties; role of enzymes in cereal and legume products including texturized proteins.

**(0603728) Dairy Science (3 Credit Hours)**

This course is an advanced study of modern heat treatments and their effects on the physical and the chemical properties of milk, modification of milk composition and utilization of casein and whey; studying the physical properties of milk and dairy products and different types of changes that take place during processing; the application of modern techniques such as ultra filtration, reverse osmosis and electro dialysis in dairy technology, topics such as automation, recombinant technology and the production of baby milk powder.

**(0603729) Fruit and Vegetable Technology (3 Credit Hours)**

This course deals with the study of the current status of technologies based on fruits and vegetables; parameters that determine quality, improving storage life and quality, processing technologies and issues related to food safety; basic techniques in the preliminary processing of fruits and vegetables.

**(0603751) Advanced Nutritional Biochemistry (3 Credit Hours)**

This course deals with a study of the biochemical aspects of carbohydrate, lipid and protein utilization by man, with emphasis on their interrelations and uniqueness of individual organs and tissues in metabolism, as well as their homeostatic regulation.

**(0603764) Nutrition and Exercise (3 Credit Hours)**

This course deals with the study of physiological and biochemical aspects of exercise in man, human performance, and the nature of cardio-respiratory fitness and muscular efficiency; the methods of measuring human energy expenditure during physical activity and energy capacity as well; the role of nutritional factors in various responses to exercise; diets and ergogenic aids for athletes; the impact of nutrition and exercise on the reduction of risk factors in diseases of lifestyle.

**(0603781) Advanced Laboratory Techniques in Food and Nutrition (2 Credit Hours)**

This course deals with the study of advanced chemical and biochemical laboratory techniques used in research as applied in nutrition and food science. The emphasis will be on different chromatographic techniques, use of isotopes, spectrophotometry and electrophoresis.

**(0603792) Seminar in Food Science (1 Credit Hour)**

Oral reports and discussions of current research and developments in food science, designed to broaden understanding of problems and stimulate research.