

Study Plan
Faculty of Agriculture
Master in
Olive Production and Processing Technology
(Thesis Track)

Plan Number	5/1/6	2013
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First: General rules and conditions:

1. This plan conforms to the valid regulations of the programs of graduate studies.
2. Specialties of admission:
 - The first priority: Bachelor's of food science and technology, Nutrition and food technology, Horticulture and crop science, and Plant production.
 - The Second priority: Bachelor's of Biology, and Chemistry.
3. Admission policies: Third policy.

Second: Special conditions: None.**Third: Study Plan: Studying (33) Credit Hours as follows:****1. Obligatory Courses: (15) credit hours:**

Course No.	Course Title	Credit hours	Theory	Prac.	Prerequisite
0601701	Experimental Design and Analysis	3	3	-	-
0601771	Olive Tree Biology	2	2	-	-
0601772	Olive Orchard Establishment	3	2	1	-
0603783	Olive and Olive Oil Processing	3	2	1	-
0603784	Olive Oil Sensory Evaluation	2	1	1	-
0603793	Scientific Research Methodology	1	1	-	-
0603794	Seminar in Olive Production and Processing	1	1	-	-

2. Elective Courses: (9) credit hours from the following:

Course No.	Course Title	Credit hours	Theory	Prac.	Prerequisite
0601775	Olive Tree Physiology	3	3	-	-
0601776	Olive Orchard Management	3	3	-	-
0601777	Olive Harvesting and Handling	3	2	1	-
0601778	Organic Farming for Olive	3	3	-	-
0601779	Applications in Olive Production	3	1	2	-
0603785	Fats and Oils Chemistry and Technology	3	3	-	-
0603786	Fats and Oils in Nutrition and Health	3	3	-	-
0603787	Quality Management of Olive Industry	3	3	-	-
0603788	Chemical and Physical Analysis of Olive Oil	3	1	2	-
0603789	Food Sensory Evaluation	3	1	2	-
0606718	Olive Pests	3	2	1	-

3. Thesis: (9) credit hours (0600799)

Appendix 2:

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

Linear and multiple regression and correlation concepts. Computation and interpretation for I, II, III and IV way analysis. Least significant difference, Duncan's Multiple Range Test, Tukey's W. Procedure, orthogonal contrasts and other mean separation procedures will be discussed. Students will be exposed to some PC applications in statistical analysis.

(2 Credit Hours) Olive Tree Biology (0601771)

This course focuses on olive taxonomy, root and shoot system (growth and development, structure, and function), bud (structure, flower bud initiation, dormancy, growth and development), leaves (anatomy, morphology, growth, and senescence), reproductive organs (juvenility, flowering, flower structure, fruit set, fruit growth and development, fruit maturation, fruit structure, seed growth and development, and seed structure).

(3 Credit Hours, 2 theor., 1 prac.) Olive Orchard Establishment (0601772)

This course discusses the selection of the proper site with more respect to soil properties and climatic conditions for establishing the olive orchard. Further it discusses the criteria used for cultivar and rootstock selection, methods of olive propagation and traditional and modern planting systems including olive training and pruning methods.

(3 Credit Hours, 2 theor., 1 prac.) Olive and Olive Oil processing (0603783)

This course will cover the pickling process for green and black olives as well as olive paste. Quality parameters related to the pickled olives will also be considered. Olive oil extraction using different techniques i.e. hydraulic, centrifugal and selective filtration (senolia method) will be explained. Factors affecting the pressed olive oil quality will be covered. Processing of olive by-products such as olive meal or pomace, olive water and soap making will be discussed.

(2 Credit Hours, 1 theor., 1 prac.) Olive Oil Sensory Evaluation (0603784)

This course will cover the importance of olive oil sensory evaluation; the preparation and proper conditions needed for conducting the sensory evaluation tests such as sensory laboratory and other facilities according to the International Olive Oil Council Standards. The different

methods used in the sensory evaluation as well as the statistical analysis of the results will also be included. In the practical part of this course, sensory evaluation tests will be performed on olive oil according to the several International Olive Oil Council Standards focusing on the positive attributes such as fruity, bitterness and pungency as well as the negative attributes including fusty, musty heated, rancid, and metallic.

(1 Credit Hour) Scientific Research Methodology (0603793)

Study of the basics of scientific research; identification of research problem; formulation of its hypothesis, data collection and statistical analysis; ethics in scientific research; training in writing a research proposal.

(1 Credit Hour) Seminar in Olive Production and Processing (0603794)

Oral reports and discussions of current research and developments in olive production and processing technology, designed to broaden understanding of problems and stimulate research.

(3 Credit Hours) Olive Tree Physiology (0601775)

This course focuses on olive physiology (root-water relationship, rootstock-scion relationship, tree hormonal balance, light interception and photosynthesis, nutrient balance, alternate bearing, bud and flower physiology, fruit and seed physiology), and olive genetics and breeding (olive germplasm, biodiversity, new cultivars and rootstocks, biotechnology and molecular biology)

(3 Credit Hours) Olive Orchard Management (0601776)

The course deals with olive tree soil nutrients management as related to tree growth and development, yield, and alternate bearing. The main pests and diseases of the olive tree and their control, with emphasis to those prevailing in Jordan are discussed. The course also aims at empowerment of students in agribusiness project evaluation skills using the main discounting techniques of financial and economic analysis software.

(3 Credit Hours, 2 theor., 1 prac.) Olive Harvesting and Handling (0601777)

This course discusses growth stages and pattern of olive fruit, indices of maturity for harvesting olives at the proper stage that suits the purpose of utilization, manual and mechanical harvesting methods, the use of growth regulators to facilitate harvesting, selection and use of proper containers, and methods of usual and refrigerated storage of olives.

(3 Credit Hours) Organic Farming for Olive (0601778)

This course discusses definition of organic farming of olive, importance, objectives,

regulations, reasons and methods of shifting into organic system, environmental protection, use of organic fertilizers, mixing and fermentation, biological diversity, and organic measures for pests, diseases and weeds control. Furthermore, it discusses selection, registration and management of organic farms, handling, storage and marketing of organic products.

(3 Credit Hours, 1 theor., 2 prac.) Applications in Olive Production (0601779)

This course focuses on most recent advances in olive production, including new cultivars, training and pruning techniques, and new harvesting methods. Field site visits are an integral part of the course to cover all aspects related to applied olive production starting from nursery tree production, site selection and orchard establishments, pruning and training of bearing and non-bearing olive trees, application of fertilizers and irrigation, integrated pest management, harvesting, processing and marketing.

(3 Credit Hours) Fats and Oils Chemistry and Technology (0603785)

This course deals with the sources, composition and properties of edible fats and oils and their effects on the quality of fat-based foods. The course also deals with the technologies of fat processing such as extraction, refining, hydrogenation and winterization. Production of some fat products such as margarine, ghee, salad oil, mayonnaise will be also considered.

(3 Credit Hours) Fats and Oils in Nutrition and Health (0603786)

Advanced study of the physiological, biochemical and nutritional aspects of dietary fats, oils, cholesterol and micro-components therein including digestion, absorption metabolism, and utilization and their regulatory aspects in health and disease states. It also involves the study of certain related physiological, genetic and biochemical problems, along with the description of evidence based nutrition guidelines for their management.

(3 Credit Hours) Quality Management of the Olive Industry (0603787)

This course covers the basic concepts of food safety and quality management. It also discusses olive and olive oil quality parameters and how they are evaluated. Statistical tools needed in the application of quality management i.e. sampling and charting will be covered. The course also deals with the structure, management and functions of quality control systems such as good manufacturing practice, ISO 9000 standards, hazard analysis and critical control point, risk analysis, good agricultural practices, as well as the audit process to ensure quality and safety in olive and olive oil processing plants. Production of organic olives and olive oil will be considered.

**(3 Credit Hours, 1 theor., 2 prac.) Chemical and Physical Analysis (0603788)
of Olive Oil**

The course covers the classical chemical and physical methods of olive oil analysis including peroxide value, free fatty acids, melting points, viscosity. The course also covers the instrumental analysis of olive oil fatty acid composition, sterols, waxes, triglycerides using gas chromatography, high performance liquid chromatography, and thin layer chromatography.

(3 Credit Hours, 1 theor., 2 prac.) Food Sensory Evaluation (0603789)

This course will cover the importance of sensory evaluation of food; some basics of food sensory evaluation i.e. taste odor and aroma recognition tests, preparation and proper conditions needed for conducting the sensory evaluation tests. The different sensory programs (i.e. comprehensive descriptive method, in-out method) difference from control method as well as the statistical analysis of the sensory results. In the practical part of this course, sensory evaluation tests will be performed on selected local fresh and/or processed foods including some traditional foods.

(3 Credit Hours, 2 theor., 1 prac.) Olive Pests (0606718)

This course focuses on the effect of pests on olive tree production and on the quality of olive oil. It further discusses the etiology and epidemiology of most important species of insects, mites, fungi, bacteria, phytoplasma, viruses, nematodes and weeds attacking olive trees. Economic damage of each pest to olive trees and to olive oil will be also emphasized.