

Department of Plant Sciences (PLSC)

Chairperson:	Saad, Adib
Professors:	Abu Jawdah, Youssef; ^P Kawar, Nasri; Saad, Adib; Talhouk, Salma; Yau, Sui-Kwong
Associate Professors:	Abou-Fakhr Hammad, Efat; Haidar, Mustafa; Makhzoumi, Jala
Assistant Professors:	Husain, Sayyed-Ali; Weltzien, Julie
Instructors:	^P Abdouni, Najah J.; ^P Ollaik, Rami; ^P Issa, Maha
Lecturer:	Battikha, George
Research Associate:	Nemer, Nabil

The Department of Plant Sciences offers a multidisciplinary program with the objective of training students in the various theoretical and practical aspects of plant sciences. Department graduates are trained to successfully contribute to the research, business, and education sectors of the region. Undergraduate course offerings are in the areas of agronomy, entomology, floriculture, fruit production, horticulture, integrated pest management, pesticides, plant breeding, plant pathology, plant physiology, vegetable production, and weed science. Introductory courses in these subjects are offered to agriculture students within the framework of the core curriculum. Specialized and advanced courses are offered to students wishing to select an area of emphasis in plant sciences for the BS degree in agriculture. The department also oversees the Landscape Design and Eco-Management (LDEM) program leading to the BS degree in this major. The LDEM undergraduate course offerings are in the areas of ecological landscape, landscape design, landscape horticulture, landscape pests, landscape design implementation and management, turfgrass culture, and machinery.

Course Descriptions

Core Courses for the BS Degree in Agriculture

PLSC 220	Principles of Plant Physiology	2.3; 3 cr.
An introduction to environmental and physiological factors affecting crop growth and development. <i>Prerequisite: BIOL 200.</i>		
PLSC 221	Principles of Entomology	2.3; 3 cr.
Insect morphology, anatomy, classification, and biology in relation to pest control in agroecosystems. <i>Prerequisite: BIOL 200.</i>		
PLSC 222	Principles of Agronomy	2.3; 3 cr.
Principles and cultural practices in the production of field crops.		
PLSC 223	Principles of Plant Pathology	2.3; 3 cr.
Fundamentals and practical aspects of plant diseases, their causes, and control.		
PLSC 224	General Horticulture	2.3; 3 cr.
Principles and practices in the production of fruits, ornamentals, and vegetables.		
PLSC 284	Fundamentals of Weed Science	2.3; 3 cr.
Fundamentals of weed biology and weed management practices with emphasis on chemical weed control.		

Elective Courses for the BS Degree in Agriculture

- PLSC 277** **Vegetable Production** **2.3; 3 cr.**
The principles and techniques of vegetable crop production, including nutrition, culture, and harvest of crops in organic and conventional production systems. *Prerequisite: PLSC 224 or consent of instructor.*
- PLSC 287** **Crop Production in Dry Regions** **3.0; 3 cr.**
A detailed account of crop production in dry regions: physical characteristics, widely grown crops, and suitable cultural practices.
- PLSC 290** **The Art of Honey Making** **2.3; 3 cr.**
The art and science of keeping honeybee colonies. Illustrates the processes of caring for bee colonies through utilizing available resources around the social honeybee colony, and wild and cultivated plants in the use of food, to glean as many potential products and services from the colony as possible. *Science elective. Not offered to FAFS students.*
- PLSC 291** **Introduction to Beekeeping** **2.3; 3 cr.**
Different aspects of culturing the honeybee starting with the behavioral patterns of bee colonies and ending with bee management considerations.
- PLSC 293** **Integrated Plant Health Management** **3.0; 3 cr.**
for Economic Crops
Basic concepts of the integrated approach to the proper management of plant diseases and insect pests of economic crops including components of plant health management (PHM) programs, and the feasibility and economics of various management strategies; specific PHM cases on major crops are discussed. *Prerequisites: PLSC 221 and PLSC 223.*
- PLSC 294** **Applied Plant Protection** **2.3; 3 cr.**
Observation and study of insect pests and plant diseases on field and greenhouse crops, with emphasis on recognition, evaluation, and control. *Prerequisites: PLSC 221, PLSC 223 or equivalent.*
- PLSC 295** **Pesticides** **3.0; 3 cr.**
Surveys the commonly used insecticides, fungicides, rodenticides, and related materials as to their chemistry, mode of action, and relation of structure to activity, toxicity, metabolism, and hazards to the environment.
- PLSC 298** **Special Topics in Plant Science** **2 cr.**
Directed study. Tutorial. *Prerequisites: fourth year standing and consent of instructor.*
- PLSC 299** **Special Topics in Plant Protection** **2 cr.**
Directed study. Tutorial. *Prerequisites: fourth year standing and consent of instructor.*

Core Courses for the BS Degree in Landscape Design and Eco-Management

LDEM 202 Landscape Design I 6 cr.

An introductory studio that guides students through the multi-layered meaning of landscape. Visual, perceptual, and spatial qualities are explored and alternatives for their graphic representation investigated. *Prerequisite: ARCH 100.*

LDEM 204 Ecological Landscape Design I 6 cr.

An introduction to the objectives and methodology of ecological landscape design in arid and semi-arid ecosystems. This course emphasizes the use of native plant resources, biodiversity conservation, and environmental sustainability. Applications are selected from urban public spaces, and commercial and recreational projects. *Prerequisite: LDEM 246.*

LDEM 209 Plant Biology 3.3; 4 cr.

An introduction to botany and the general principles of plant biology. Course material is aimed at developing an understanding and appreciation of the interaction of plants with their environment, and providing applications and insights relevant to landscape students.

LDEM 211 Landscape Horticulture I 2.3; 3 cr.

Principles and practices in the production and management of landscape plants; the identification of landscape plants; introduction to sexual and asexual plant propagation, identification, selection, and management of annuals, perennials, trees and shrubs, herbs and vegetables, indoor plants, cut flowers, plants for dry lands, landscape plants, and their ecological impact.

LDEM 212 Landscape Horticulture II 2.3; 3 cr.

Survey, identification, landscape characters, and management of herbaceous and woody landscape plants. The student will learn about the landscape uses of plants and the management requirements in different site/use situations. *Prerequisite: LDEM 211.*

LDEM 215 Introduction to Landscape Pests 2.3; 3 cr.

The fundamentals, biology, and ecology of landscape insects, mites, plant pathogens, and weeds.

LDEM 216 Landscape Design II 6 cr.

The process of landscape design is introduced, starting with site appreciation and analysis, through concept development and articulation using building materials, plants, and landscape furniture. The focus is on conceptual thinking and communication both verbally and graphically. This course trains students to explore different computer-aided presentation techniques and to use AutoCAD. *Prerequisite: LDEM 202.*

LDEM 227 Applied Plant Protection in Landscape 2.3; 3 cr.

The diagnosis of landscape pests including diseases, insects, mites, and weeds of major importance, and applied measures for their prevention and control in urban and natural environments.

LDEM 228 Ecological Landscape Design II 6 cr.

A course offered at the Agricultural Research and Educational Center (AREC) in the Beka'a. The concepts and methods introduced in the previous term are applied to rural and agricultural landscapes with a hands-on approach with a focus on local communities. *Prerequisite: LDEM 204.*

LDEM 229 Turfgrass Culture, Machinery, and Management 2,3; 3 cr.

An introduction to turfgrass use, establishment, and management. This course focuses on the environmental impact of turfgrass landscapes in arid regions. Students are introduced to the machinery used in landscape management.

LDEM 241 Final Year Project: Landscape Design 6 cr.

Each student will work on a project of their choice, with the guidance and approval of an appointed faculty committee. The natural, environmental, socio-cultural, and legal constraints, together with the specific requirements of the project, will form the basis for developing the landscape design. Different techniques are used such as GIS and other software to assist in evaluating the site and articulating the proposal. *Prerequisite: LDEM 228.*

LDEM 242 Final Year Project: Landscape Implementation and Management 6 cr.

Having finalized the landscape design in the previous term, this last term focuses on developing technical and implementation drawings and a management plan. Working on their individual projects, the students have the opportunity to integrate the knowledge and skills gained in the previous years into a comprehensive landscape design proposal. *Prerequisite: LDEM 241.*

LDEM 245 Irrigation Methods for Landscape Designs 3 cr.

A course that acquaints students with the design and production of economical irrigation systems that keep landscapes green while conserving water.

LDEM 246 Landscape Design III 6 cr.

A finalized landscape design is developed toward the preparation of implementation drawings. Special emphasis is placed on building materials and construction, technical detailing, landscape furniture, plant selection and their role in articulating the landscape design. Landscape specifications, bills of quantities, and costing are also introduced. *Prerequisite: LDEM 216.*

LDEM 250 Computer-Aided Design 2,3; cr.

An introduction to computer-aided landscape design and analysis. Students are provided with software tools for landscape drafting and project management that can be applied in design courses, and can later be developed in a landscape design project.

LDEM 295 Landscape Seminar 1 cr.

Current issues in landscape design and eco-management.

LDEM 296 Landscape Seminar 1 cr.

Current issues in landscape design and eco-management.

Elective Courses for the BS Degree in Landscape Design and Eco-Management

LDEM 201 Landscape History and Theory 3 cr.

A historical review of garden and landscape design that explores the role of regional resources and environmental, socio-economic, and political factors in shaping garden and landscape design concepts. Current approaches to landscape design, from the gardenesque to the ecological, serve as a basis for exploring meaning and representation in landscape.

LDEM 260 Current Issues of Landscape 3 cr.

A review of recent developments in landscape design on an international basis. The course emphasizes case studies and a critical review of the contemporary role of the profession.

LDEM 261 Spatial Structure and Movement 3 cr.

The course is concerned with the experience of outdoor and indoor spaces, and the direct influence the placement of any object has on the perception of the latter and the movement within. The course is based on the assumption that the notion of movement and body proportion for mankind has been a primary design tool throughout history and will try to reevaluate this tool for contemporary design.

LDEM 262 Healing Landscapes: Contemporary and Historical Settings 3 cr.

The course is proposed in the context of a changing healthcare system and the need for psychologically beneficial interventions in healthcare settings. It considers various approaches to the design of therapeutic landscapes, the degree to which historical precedents are applied in the present-day medical setting, and the healing potential of these cultural archetypes in terms of environmental psychology.

LDEM 270 Ornamental Plants for Dry Landscapes 2 cr.

A survey of native, wild, and domesticated plants adapted to dry areas with potential use in dry landscapes, with an overview of the different environmental and physiological factors that determine plant growth and developments under such dry conditions.

Graduate Programs

Graduate study programs leading to the MS degree with thesis or non-thesis options are offered in two majors: Plant Science and Plant Protection. The specific areas of emphasis for research in plant science include crop production in semi-arid areas, plant breeding, plant physiology, tissue culture, and vegetable production in open fields and protected environments. Areas of emphasis for research within the plant protection major include entomology, pesticide toxicology, plant pathology, and weed science.

PLSC 300 Graduate Tutorial 1–3 cr.
Research or advanced discussion of special problems. *Prerequisite: consent of instructor.*

PLSC 307 Advanced Crop Production 3.0; 3 cr.
Theories and principles of plant growth, development, and responses to the environment, with an integrated approach to understanding crop productivity. *Prerequisites: PLSC 220 and PLSC 222.*

PLSC 312 Advanced Principles and Methods in Plant Pathology 2.3; 3 cr.
Serological and molecular diagnostic techniques, nucleic acids hybridization, PCR, marker assisted selection, brief review of physiology of host-pathogen relationships, and current methods of research including cloning and transgenic plants. *Prerequisite: PLSC 223 or consent of instructor.*

PLSC 315 Seed Biology 3.0; 3 cr.
Principles and factors involved in the production, harvesting, processing, and certification of seeds for sowing. *Alternate years.*

PLSC 316 Advanced Vegetable Production 3.0; 3 cr.
Physiological and genetic control of growth and management of vegetable plants and their products; effects of nutrition, irrigation, and other variables on crop performance and quality of produce; presentation and interpretation of recent research progress in vegetable production.

PLSC 317 Plant Parasitic Fungi and Bacteria 2.3; 3 cr.
Morphology, taxonomy, and identification of fungi and bacteria parasitic on plants. *Prerequisite: PLSC 223. Alternate years.*

PLSC 318 Plant Virology 2.3; 3 cr.
Fundamental and practical aspects of plant virology including isolation, characterization, identification, and management of plant pathogenic viruses, including gene silencing and transgenic plants. *Prerequisite: PLSC 223. Alternate years.*

PLSC 320 Toxicology of Pesticides 3.0; 3 cr.
General principles of toxicology and specific study of the modes of action of the major groups of pesticides including their hazards, toxicity, and metabolism in biological systems; movement and fate of pesticides in the environment. *Prerequisite: PLSC 295.*

PLSC 329 Global Issues in Conservation of Plant Genetic Resources 2.0; 2 cr.
Analysis and discussion of global issues related to plant conservation and the role of governmental, non-governmental, local, regional, and international organizations.

