Department of Agriculture (AGRI)

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Undergraduate Program

The Department of Agriculture offers a multidisciplinary program with the objective of training students in the various theoretical and practical aspects of agricultural sciences and Agribusiness. Department graduates are prepared to successfully contribute to the agricultural research, business, and education programs in the region.

The department offers two programs, one leading to a BS degree in Agriculture and the Diploma of Ingénieur Agricole, and the other leading to a BS degree in Agribusiness.

The Agriculture (AGRI) program prepares students to address current agricultural issues at the regional and global levels using their scientific knowledge to improve production and protect the environment. The department provides practical and up-to-date knowledge in plant production, plant health management, animal production and health, and land and water conservation. The department also trains students to become skilled farm operators and managers who are innovative and responsive to local and regional needs and who are capable of adapting to market changes and rising production costs.

Undergraduate courses are offered in the areas of agronomy, agro-chemicals, agricultural machinery, entomology, horticulture, irrigation, plant health management, plant breeding, plant pathology, soils, weed science, agricultural economics, and rural development. In addition, the program covers animal agriculture including nutrition, physiology, management, and health. Introductory courses in these subjects are offered to agriculture students within the framework of a core curriculum. Specialized and advanced courses are also offered as electives to undergraduates.

The Agribusiness (AGBU) program combines the study of management with agricultural sciences in order to provide students with an understanding of the economic and business principles that underlie management tools and their application to agricultural and related businesses. The educational objectives of the AGBU program are to prepare students to become entrepreneurs, business leaders, skilled farm operators, and future policy advisers who are well-grounded in agriculture and food production and who are capable of communicating and using their skills in order to improve their livelihood and that of their community.

Undergraduate courses are offered in the areas of agriculture, business management and accounting, marketing, agriculture economics, entrepreneurship, and rural development. Specialized and advanced courses are also offered as electives to undergraduates.
Course Descriptions

Core Courses for the BS Degree in Agriculture

AGSC 201 Orientation to Agriculture and Food Systems 2.0; 2 cr.
This course provides students with a basic introductory knowledge about the various disciplines and related subjects in the Faculty of Agricultural and Food Sciences. It covers the various aspects of agricultural production and development including natural resources, plant sciences, plant health management, animal production and management, Agribusiness, nutrition and food sciences, and landscape design and eco-management.

AGSC 212 Microeconomic Theory of Food and Farming 3.0; 3 cr.
The course introduces economic principles which are then used to explain the production of goods and services, household behavior, economic equilibrium and the welfare consequences of alternative exchange mechanisms. Special applications will be given to decision-making and the allocation of resources for the agricultural firm and consumer behavior and demand for agricultural and food products. Fall and Spring. Students cannot receive credit for both AGSC 212 and ECON 211; however, the two courses will be treated as equivalent.

AGSC 215 Introduction to Soils 2.3; 3 cr.
The course focuses on the study of the origin, properties, classification, and management of soil with emphasis on soil behavior in relation to irrigated agriculture, ecology, and the environment. Prerequisite: CHEM 200 or equivalent.

AGSC 220 Principles of Plant Physiology 2.3; 3 cr.
The course is an introduction to environmental and physiological factors affecting crop growth and development. Prerequisite: BIOL 200.

AGSC 221 Principles of Entomology 2.3; 3 cr.
The course focuses on the study of insect morphology, anatomy, classification, and biology in relation to pest control in agroecosystems. Prerequisite: BIOL 200.

AGSC 222 Farm Practices 0.6; 1 cr.
The course exposes students to practical experience in operational activities and management decisions essential in modern agriculture. Prerequisites: AGSC III standing and eligibility for enrollment in the regular program at AREC.

AGSC 223 Agricultural Project 0.6; 2 cr.
The course involves directed study with field and laboratory work. Prerequisites: AGSC III standing and eligibility for enrollment in the regular program at AREC.

AGSC 224 General Horticulture 2.3; 3 cr.
The course focuses on the principles and practices in the production of fruits, ornamentals, and vegetables.

AGSC 225 Rural Social Systems in Agricultural and Rural Development 3.0; 3 cr.
The course is an examination of institutional and sociological problems of rural areas; influence of rural institutions on rural development.

AGSC 226 Farm Power and Machinery 2.3; 3 cr.
The course focuses on the study of internal combustion engines, power trains, drawbar performance, stability, and safe operation of tractors; functional requirements, principles of operation, performance evaluation, and selection of farm machinery.

AGSC 227 Surveying and Irrigation Principles 0.3; 1 cr.
The course explores the topographic surveying, irrigation methods evaluation, soil physical properties, soil water, and water flow measurement.

AGSC 228 Irrigation Principles 2.3; 3 cr.
The course explores plant water requirements, irrigation scheduling, soil-plant-water relations, flow measurements, wells, pumping, drainage, and surveying, and introduction to irrigation systems design and methods.

AGSC 231 Principles of Agronomy 2.3; 3 cr.
The course focuses on the principles and cultural practices in the production of field crops.

AGSC 232 Principles of Plant Pathology 2.3; 3 cr.
The course explores the fundamentals and practical aspects of plant diseases, their causes, life cycles and integrated disease management with emphasis on several case studies.

AGSC 235 Agricultural Extension in Development 2.0; 2 cr.
The course involves a comparative study of developmental philosophy, objectives, and adaptation to developing countries; principles and methods of extension and adult teaching. Prerequisite: AGSC 225.

AGSC 241 Farm Management 3.0; 3 cr.
The course focuses on the application of modern principles and techniques of management to the farm sector. Prerequisite: AGSC 212 or ECON 203.

AGSC 265 Soil Fertility 2.3; 3 cr.
The course focuses on the study of behavior of native and applied fertilizer elements in soils in relation to crop production, soil fertility evaluation, fertilizer manufacture, fertilizer application in irrigation systems, and economics of fertilizer use. Prerequisite: AGSC 215.

AGSC 284 Fundamentals of Weed Science 2.3; 3 cr.
The course explores the fundamentals of weed ecology and weed management practices with emphasis on chemical weed control and integrated weed management systems.

AGSC 290 Project Planning and Appraisal 3.0; 3 cr.
The course introduces different techniques commonly used in project planning and appraisal.

AGSC 296 Agriculture Project Presentation 1 cr.
Prerequisite: AGSC IV standing.
AVSC 222  General Livestock Production  2.3; 3 cr.
The course explores modern principles and practices in beef, sheep, and dairy production and reproduction.

AVSC 224  Agricultural Microbiology  2.3; 3 cr.
The course covers basic and applied microbiology. The basic microbiology includes bacteriology, virology, parasitology, and immunology, and the applied microbiology includes veterinary, soil, water, and food microbiology.

AVSC 226  Poultry Production  2.3; 3 cr.
The course explores modern principles and practices in poultry production with special emphasis on Middle Eastern conditions. Prerequisite: AVSC 271.

AVSC 243  Genetics  3.0; 3 cr.
The course explores principles of inheritance, with an introduction to modern genetics.

AVSC 271  Animal Nutrition  3.0; 3 cr.
The course focuses on the study of structure and functioning of digestive systems of livestock and poultry; bioenergetics, nutritional deficiencies, and nutrient requirements of farm animals. Prerequisite: NFSC 261.

AVSC 275  Anatomy and Physiology of Farm Animals 3.0; 3 cr.
The course explores the systematic anatomy and physiology of farm animals.

Elective Courses for the BS Degree in Agriculture

AGSC 219  Apiculture  2.3; 3 cr.
The course introduces the basics of the honeybee world by exploring the natural history of apiculture, honeybee biogeography and evolution, biology, social structure, natural enemies, hive products and pollination dynamics. It illustrates the ecological aspects of one of nature’s most fascinating creatures under the looming environmental degradation and focuses on hands-on beekeeping activities.

AGSC 250  Organic Farming  1.2; 3 cr.
The course explores advances in organic farming and growing systems with emphasis on farm planning, certification, marketing, information, and organic farming practices.

AGSC 251  Vegetable Production  3.0; 3 cr.
The course introduces students in the Agriculture program to a good scientific and hands-on practical knowledge of vegetable production. Students will also gain an understanding of the physiological controls on vegetable crop yield under protective and local environments. They will become familiar with the current sources of information available to produce and develop production management skills through the production of vegetables. Practical sessions will guide the students to understand different vegetable crop production techniques used in Lebanon and worldwide.

AGSC 252  Conservation Agriculture  2.3; 3 cr.
The course is an introduction to conservation agriculture. Options and suitable agricultural techniques which enhance the amount of water and organic matter in the soil and reduce erosion and pests will be discussed. Prerequisites: AGSC 215, AGSC 231, and AGSC 284.

AGSC 262  Introduction to Irrigation Methods  3.0; 3 cr.
The course explores innovative methods for the design of irrigation systems including micro-irrigation, sprinkle irrigation, and surface irrigation. Conceptual and detailed design of irrigation networks and system components from the professional perspective. Prerequisite: AGSC228 or AGSC202.

AGSC 293  Integrated Plant Health Management for Economic Crops  3.0; 3 cr.
The course focuses on the systematic anatomy and physiology of farm animals.

AGSC 299  Special Topics in Agricultural Science 2 cr.
The course is a directed study. Tutorial. Prerequisites: Fourth year standing and consent of instructor.

AVSC 230  Animal Health and Diseases  3 cr.
The course introduces students of varying backgrounds to principles of Animal Biological and Health Sciences. It presents different selected commensal and pathogenic organisms causing common symptomatic and asymptomatic diseases; signs of health and disease specific to different domestic, marine mammal, fish and wildlife animal species; epidemiology of disease incidence; immunology, immune competence vs. tolerance, and vaccination principles; emerging animal diseases; monitoring disease incidence using surveillance techniques; vector biology; and methods used to prevent disease occurrence including principles of management, environmental modification and nutritional support. Free elective.

AVSC 241  Principles of Dairying  2.3; 3 cr.
The course explores management, housing, feeding, breeding, and record-keeping in dairy production.
AVSC 242  Small Ruminant Production in Arid Regions  2.3; 3 cr.
The course explores breeding, feeding, and management of sheep and goats under arid conditions.

AVSC 260  Introduction to Laboratory Animal Science and Management  2.3; 3 cr.
This is an introductory course covering the essentials of laboratory animal species biology, behavior, physiology, and genetics; health and diseases; experimental models; facility and staff management within laboratory animal facilities; and regulatory compliance requirements in the US and European countries. Students should have previously taken any combination of two courses in the natural and health sciences and in management to gain prerequisite knowledge. Free elective.

AVSC 276  Animal Physiology Laboratory  0.3; 1 cr.
Pre- or corequisite: AVSC 275.

AVSC 277  Animal Breeding  2.0; 2 cr.
The course focuses on the principles of permanent improvement of animal and poultry production. Prerequisite: AVSC 243 or BIOL 223.

AVSC 278  Feeds and Feeding  2.3; 3 cr.
The course focuses on the study of characteristics, conservation, and preparation of feeds; feeding of various classes of livestock.

AVSC 279  Companion Pet Birds and Animals  3.0; 3 cr.
The course explores breed and stock selection, equipment, stocking densities, routine management, rearing, feeding, behavior and interaction with humans, optimum production, and health care of pet birds and pet animals. Free elective.

AVSC 280  Aquarium, Marine, and Farming Fish  3.0; 3 cr.
A course that covers the different fishing techniques, fish farming, characteristics of fish, comparison of classes of fish, the setup of fresh water and marine aquariums, and the common diseases of fish. Free elective.

AVSC 281  Production of Novel Avian Species  3.0; 3 cr.
The course covers management practices in the production of economically beneficial avian species other than the domestic chicken (e.g., ratites, turkey, water fowl, and others.) Free elective.

AVSC 282  Pet Birds and Animals  3.0; 3 cr.
It is a course that describes the anatomy and physiology of pets belonging to mammalia, reptilia, aves, and osteichthyes. The history, classification, breeds, selection, rearing, feeding, production, and health of sixteen pets will be studied. Prerequisite: BIOL 200.

AVSC 299A  Special Topics in Animal Sciences for Agriculture program  2 cr.
The course is a directed study. Tutorial. Prerequisites: Fourth year standing and consent of instructor.

Core Courses for the BS Degree in Agribusiness

AGSC 202  Introduction to Land and Water Resources  2.3; 3 cr.
In this course, students develop an understanding of current issues in land and water resources, including soil and water conservation and management, land classification and reclamation, soils and environmental quality and sustainable agro-ecosystems. Prerequisite: AGSC 204.

AGSC 203  Crop Production and Protection  2.3; 3 cr.
The course provides an overview of the technologies used in the production of crops. The student will acquire a knowledge and understanding of current crop production systems, the end market requirements for products as well as the quality standards of these products. Students will also learn current techniques in crop protection and yield management.

AGSC 204  Natural Sciences for Agribusiness  3.0; 3 cr.
This course is an introduction to chemistry and biology designed for first-year Agribusiness students. It aims to familiarize students with the basic concepts and theoretical principles of modern chemistry and biology. Students will gain an appreciation of the importance that biology and chemistry play in our natural lives.

AGBU 210  Marketing in Agribusiness  3.0; 3 cr.
The course is an overview of marketing activities in Agro-food industries, including marketing inputs in strategic planning, global marketing, marketing research, analysis of buyer behavior, market segmentation and positioning, and development of the marketing mix elements. Prerequisite: Junior status standing.

AGBU 211  Introduction to Agricultural Issues and Policies  3.0; 3 cr.
The course is a survey of global food and agricultural issues. It covers the role of agriculture in economic development, trade in food and agricultural products, global food production, consumption and marketing patterns, economics of technical change and food assistance and agriculture and the environment.

AGSC 212  Microeconomic Theory of Food and Farming  3.0; 3 cr.
The course introduces economic principles which are then used to explain the production of goods and services, household behavior, economic equilibrium and the welfare consequences of alternative exchange mechanisms. Special applications will be given to decision-making and the allocation of resources for the agricultural firm, consumer behavior and demand for agricultural and food products.

AGBU 213  Legal Aspects of Agribusiness  3 cr.
The main objective of the course is to help Agribusiness students understand the Lebanese and American legal aspects of common agricultural business activities, as well as the formation and function of Agri-commercial companies and related ethical principles. Prerequisite: Junior status standing.

AGBU 219  Entrepreneurship in Agriculture  3.0; 3 cr.
The course focuses on the study of integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using the compilation by students of Agribusiness plans. Prerequisite: Junior status standing.
AGBU 236 New Trends in Agricultural and Food Systems 3.0; 3 cr.
The course explores current trends in agricultural trade, developments in private sector markets and in public policy and the concerns related to the effects of agricultural trade on the environment, food security, and regional development. The course will also address the issue of the challenges to food exporters from developing countries posed by the need to comply with ever-stricter standards. Moreover, the course will cover the global market structures of the agricultural products most relevant to the Mediterranean countries and the experience and present thinking about the pros and cons of the spread of genetically modified products, designation of origins and other food labeling mechanisms. Prerequisite: Senior status in Agribusiness.

AGBU 239 Agribusiness Communication Skills Workshop 0 cr.
The course is a ten-hour workshop designed to introduce students to the various communication skills needed in a typical work environment. Mastering these skills plays a profound role in shaping and advancing professional careers in all types of industries and work scopes. The workshop introduces specific guidelines for the effective use of a variety of communication skills in the workplace in an interactive manner by simulating the work environment.

AGBU 240 Career Planning Workshop for Agribusiness 0 cr.
The course is a ten-hour workshop designed to build awareness of changing career patterns and major personal and professional influences that impact future careers. Issues such as preparation for joining the labor market, basic career guidance, understanding career stages, and practicing self-assessment are emphasized. Prerequisite: Junior status standing.

AGBU 248 Operation Management for Agribusiness 3 cr.
This course covers the essentials of supply chain management and quantitative techniques needed for the planning and implementation of Agribusiness operations. This course includes optimization of production and cost minimization. Prerequisite: Senior status standing.

AGSC 253 Harvest and Post-harvest Issues and Strategies 3.0; 3 cr.
This course discusses the structure of the agricultural harvesting and marketing system with emphasis on factors determining farm level prices. It also emphasizes how markets coordinate consumer desires and producer costs through marketing channels, the impact of market structure, grades, information, product form, and advertising on farm prices, and the international trade impact on producers, consumers, Agribusinesses, and the government. Prerequisites: AGSC 202, AGSC 203, and AGSC 212.

AGBU 255 Field Study of the Rural Agro-economy 3.0; 3 cr.
Tours of Agribusiness enterprises and rural farms in Lebanon are organized with the intent to observe the management and marketing practices used in successful operations of different Agribusiness structures. Students will also learn how the agriculture value chain is structured within the rural economy. Prerequisites: AGSC 202 and AGSC 203.

AGBU 256 Summer Internship 1 cr.

AGBU 292 Agribusiness Final Year Project 5.0; 5 cr.
It is a milestone course for students in Agribusiness. Application of concepts, tools, and principles including management, finance, marketing, economic theory, and quantitative methods to applied agricultural decisions on selected agricultural and Agribusiness projects that enhance team-building as well as written, and oral communication skills. Prerequisite: Senior status standing.

AVSC 220 Livestock Production 3.0; 3 cr.
The course is divided into three main sections. The first section introduces the types and breeds of livestock, terminology, methods, management systems, techniques of animal production and consumer impact. The second section introduces the students to the modern management practices required for the production of economically beneficial avian species including the domestic chickens, turkeys, water fowls, game birds and others. The third section discusses the nature of economic diseases in domestic animals and avian species and the regulations of World Trade Organization in import and export of animals, including rules that prevent the transboundary transmission of microbes causing economic diseases.

Elective Courses

AGSC/AVSC 273 The Food-Water and Energy Nexus 3.0; 3cr.
Water, energy and food systems are inextricably linked. Water requires energy for pumping, irrigation and domestic use. Energy requires water for cooling and production; food requires both energy and water for crop production and distribution. The Water-Energy-Food Nexus has therefore been found widespread interest among academic and practitioners in the public and private sector. In many ways, the WEF-Nexus is a concept of the 21st century, which requires interdisciplinary skill sets to identify solutions and innovative approaches. At the same time, it equips students with crosscutting knowledge and understanding to conceive solutions at various scales for highly complex challenges.

AGSC 286 The Fruitful Branches: Grapevine and olive 3.0; 3cr.
This course explores facts on grape and olive production and distribution around the world and particularly in Lebanon and the art and science of planting, growing and training these rich crops. The course is a broad-based course covering aspects from history to modern trends, from production to processing, from vine to wine and from olive to olive oil.

AGSC 283 Precision Farming and Agricultural Technology 2.3; 3cr.
This course aims at teaching students the principles of site specific management to optimize off farm inputs and enhance environmental economic sustainability. The course will cover the available technology for implementing precision agriculture including: computers, GPS, yield monitors, variable rate control systems, mechanized soil sampling, and post-harvest processing controls with the implication on planning different agricultural activities starting with tillage and planting until harvesting and post-harvesting. Precision animal farming will be also addressed with its related technology and applications.