Faculty of Agricultural and Food Sciences (FAFS)

Undergraduate

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Coordinators of Undergraduate Programs

Mohamad Ghassan Abiad	Coordinator of Undergraduate Studies Program, Food Science and Management Program
Ali Chalak	Coordinator of Undergraduate Studies Program, Agribusiness Program
Mohamad Talal Farran	Coordinator of Undergraduate Studies

Historical Background

Basic university-level courses in agriculture were offered by the School of Arts and Sciences at AUB as early as 1914. Between the 1930s and 1940s, the university fulfilled its commitment to improving the livelihood of the less fortunate through the creation of the Institute of Rural Life. The institute brought together students and faculty from various university schools and departments to implement improvement projects in rural health, education, and farming. The School of Agriculture was established in 1952, along with the Advancing Research, enabling communities (AREC), a 100-hectare facility located in the Bekaa region 80 km away from the main AUB campus. The school offered a four-year program leading to a BS degree in agriculture and the diploma of ingénieur agricole and offered a one-year Technical Vocational Training (TVT) course, offered to government extension agents from 1956 to 1971. These programs contributed greatly to building the capacity of agricultural scientists and technicians from the Middle East region. A graduate program leading to the MS in agriculture was initiated in 1956.
The importance of food and nutrition and their linkage to agriculture at AUB was recognized in the late 1970s. The school, which had become the Faculty of Agricultural Sciences in 1958, was renamed the Faculty of Agricultural and Food Sciences (FAFS) in 1979, and a three-year BS program in nutrition and dietetics (NTDT) was initiated in 1980. An eleven-month dietary internship program was established at the AUB Medical Center in 1983. The program proved very successful and grew rapidly to become a significant component of FAFS. Global and regional changes in the role and functions of agriculture, nutrition and food created a demand for new courses. FAFS responded by launching several new programs. In 2012, a bachelor of landscape architecture was introduced to replace the BS program in landscape design and eco-management, which started in 2000. The BS program in food sciences and management was launched in October 2002 in response to the rapid expansion of the agri-food industry in Lebanon and the region. Lastly, the importance of entrepreneurship and the need to develop efficient and effective food value chains in the region led to the initiation of the agribusiness program in February 2009.

Mission

The mission of FAFS is to foster sustainable enhancement of the health and well-being of people and nature throughout Lebanon and the region. To achieve its goals, the faculty uses basic and applied research as well as student-centered learning to prepare leaders and agents of change to address issues of local and global relevance at the nexus of human nutrition, food security and the sustainable use of resources.

Vision

FAFS is a reference academic center specialized in issues of relevance to the Middle East related to agriculture, food, nutrition, and the environment for the enhancement of livelihoods, human health, and well-being.

Undergraduate Programs

The Faculty of Agricultural and Food Sciences (FAFS) consists of two departments:

The Department of Agriculture offers two bachelor's degrees:
- Bachelor of Science (BS) in Agriculture and Diploma of Ingénieur Agricole
- Bachelor of Science (BS) in Agribusiness

The Department of Nutrition and Food Sciences offers two bachelor's degrees:
- Bachelor of Science (BS) in Food Science and Management
- Bachelor of Science (BS) in Nutrition and Dietetics

This structure clearly outlines the programs available within each department.

Admissions

AUB admits students from a twelve-year schooling system, starting with elementary 1. Students holding diplomas from a twelve-year secondary school system may gain admission to the Faculty of Agricultural and Food Sciences by completing the freshman program at AUB or its equivalent elsewhere. Those coming from the freshman program should follow the below table:

Major Requirements / Useful Electives
Agribusiness completion of MATH 101, any combination of science courses totaling 9 credits, CHEM 200, and courses in the humanities and a cumulative GPA of at least 2.3 in the freshman year.
Agriculture completion of MATH 101, CHEM 101, CHEM 101L, and BIOL 101, CHEM 200, and courses in the humanities and a cumulative GPA of at least 2.3 in the freshman year.
Food science and management completion of MATH 101, CHEM 101, CHEM 101L, and BIOL 101, CHEM 200, and courses in the humanities and a cumulative GPA of 2.7 in the freshman year.
Nutrition and dietetics completion of MATH 101, CHEM 101, CHEM 101L, and BIOL 101 CHEM 200, SOAN 201, and courses in humanities and a cumulative GPA of at least 3.0 in the freshman year. (Admission is by selection of the most promising eligible applicants)

Students from a twelve-year secondary school system must hold the Lebanese Baccalaureate Part II in general sciences, life sciences, or sociology and economics, or the equivalent if they come from another country. Holders of Baccalaureate Part II in humanities may be considered for admission provided they take an additional course, MATH 203. To be considered for admission, students applying for transfer from another faculty or university must have a minimum grade point average of GPA: 2.3 for agriculture and agribusiness, and GPA: 3.0 for nutrition, and GPA: 2.7 for food sciences and management. Admission is by selection of the most promising eligible applicants. For complete and detailed information regarding admission to the university, including recognized certificates, see the Office of Admissions section in this catalogue.

Requirements for Premedical Study

Students entering the Faculty of Agricultural and Food Sciences and who ultimately intend to enter the Faculty of Medicine must complete the premedical requirements as outlined in the Admissions section under the Faculty of Medicine in the Graduate Catalogue.

Transfers

To transfer to the Faculty of Agricultural and Food Sciences from another faculty or university, course credits pertinent to the agricultural curriculum may be transferred at the discretion of the Academic and Curriculum Committee. However, advanced standing can be considered only for students who transfer from an agriculture program of another recognized institution of higher learning. Transfer students from faculties within AUB to FAFS are allowed to transfer a maximum of two terms towards the residency requirements at FAFS based on the rate of equating each 12 credits of transferable courses taken at AUB to one residency term. For purposes of residency requirements, two summer terms are equivalent to one term.
Students wanting to transfer to another faculty must take at least 50 percent of their courses at FAFS including one FAFS course (2 or 3 cr.) in the corresponding major per term. Students who do not register for at least 50 percent of courses required by their major in the first term will automatically be given the status of majorless in the second term. Students should transfer after two terms; if they fail to secure acceptance to the desired major by the end of the second term, they will be dropped from the faculty.

Transfer of Courses

Transfer of courses taken at AUB with a minimum grade of (D or 1.0) or taken at another university with a minimum grade of (C+ or 2.3) is transferable to FAFS. Students should submit a written request to the Academic and Curriculum Committee.

Minors

The Faculty of Agricultural and Food Sciences offers four minors:

- A minor in agribusiness under the Agriculture Department
- A minor in nutrition and dietetics and a minor in food sciences and management, both under the Nutrition and Food Sciences Department
- An interdisciplinary minor in food systems

Students can find more detailed information about these minors in their respective departments.

Minor in Food Systems

Food security, climate change, and depletion of natural resources are now major concerns at the national and global levels. The vital need for sustainable production techniques able to reconcile economic profitability and environmental preservation is exerting increasing pressure on public policies and agendas. The interdependence of these concerns requires the development of a comprehensive and multidisciplinary approach to food systems.

Goal

This interdisciplinary minor in food systems equips students with the knowledge and skills required to develop a comprehensive view and understanding of the different yet interdependent stages of food systems including food production, processing, marketing, distribution, and consumption. 18 credit hours are required; 3 credits of each of the majors listed below.

List of Courses for the Minor in Food Systems

NFSC 220, NFSC 252, LDEM 211, AVSC 220, AGSC 203, and AGBU 210.

Learning Outcomes

- Identify key stages of food-product development.
- Acquire knowledge and practical skills in land preparation, farm irrigation methods and water measurement techniques.
- Develop an awareness of safe working environment and monitoring sustainable practices in livestock and field crop production.
- Determine the usefulness and limitations of various techniques in food production and processing practices and assessing their impact on human health.
- Understand concepts of environmental horticulture and their role in promoting nature conservation.
- Develop marketing and distribution strategies to promote food products.

For more information regarding minors, please refer to the General University Academic Information section of the catalogue.

Department of Agriculture (AGRI)

Chairperson	Jaafar, Hadi
Professor Emeritus	Kawar, Nasri
Professors	Abou Jawdah, Yusuf; Chalak, Ali; Farran, Mohamad Talal; Haidar, Mustapha; Hamadeh, Shady; Jaafar, Hadi
Adjunct Professor	Mohtar, Rabi
Adjunct Associate Professor	Chaaban, Jad
Assistant Professors	El Kayal, Walid; Gedikoglu, Haluk
Lecturers	Jaber, Lina; Doughan, Youssef
Instructor	Sobh, Hana

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 agriculture (AGRI) program prepares students to become:

1. Agricultural engineers and professionals with central positions, who create sustainable and ethical solutions and enhance knowledge in various sub-disciplines of agriculture in local, regional, and global practices.
2. Graduates who attend and complete advanced degrees at top universities worldwide.
3. Leaders and innovators in their profession and serving their community.

Students will be trained 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.

The department offers two concentrations. A concentration requires a total of 9 credits. Students in their final year may select 9 credits from the lists, which include courses in agricultural sciences and animal and veterinary sciences. Students who do not wish to do a concentration will be considered to be following the broader Agriculture sequence (Receive a bachelor of science in agriculture and diploma of ingénieur agricole with no concentration).

Undergraduate courses are offered in the areas of crop systems, agro-chemicals, farm power and alternative energy, plant health, organic and intensive agriculture, water technologies, conservation agriculture, soils, GIS in agriculture, agricultural economics, and rural development. In addition, the program covers animal agriculture including nutrition, genetics and 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 the fields of 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, agricultural economics, entrepreneurship, and rural development. Specialized and advanced courses are also offered as electives to undergraduates.

BS in Agriculture and the Diploma of Ingénieur Agricole

The BS in agriculture and the diploma of ingenieur agricole is a four-year multidisciplinary program with the objective of producing graduates who become:

1. Agricultural engineers and professionals with central positions, who create sustainable and ethical solutions and enhance knowledge in various sub-disciplines of agriculture in local, regional, and global practices.
2. Graduates who attend and complete advanced degrees at top universities worldwide.
3. Leaders and innovators in their profession and serving their community.

The program trains students in the various theoretical and practical aspects of agricultural sciences. It prepares students to address current agricultural issues at the regional and global levels. It prepares students to address current agricultural issues at the regional and global levels using their scientific knowledge to improve production and protect the environment. Specifically, the program aims to develop students' understanding of the principles and practices of sustainable agriculture and its role in food production, environmental conservation, and community development. Students will build the necessary skills to design, implement, and evaluate agricultural systems and technologies that are technically and scientifically effective, but also economically, socially, and environmentally sustainable. Through critical thinking and problem-solving, students will analyze and address the complex challenges facing agriculture and food systems, against a backdrop of mounting climate change and food security vulnerabilities. Additionally, students will gain an understanding of the political, economic, and social factors that shape agricultural policies and practices and be able to advocate for sustainable and climate-smart solutions. The program emphasizes the importance of hands-on experience through internships, research projects, or other field-based learning opportunities, and the use of technology to improve the performance of agriculture and food systems. Students will gain an understanding of the relationship between agriculture and the environment, human health, and economic development. In addition, the program enhances the ability of its graduates to manage farming operations and agricultural businesses.

Graduation Requirements

To be eligible for graduation with the degree of BS in agriculture (AGRI), and the diploma of ingénieur agricole, students must:

- complete a minimum of 128 term credit hours (AGRI).
- complete a minimum of eight terms of residency (AGRI).
- achieve an overall minimum grade average of C+ (GPA 2.3).
- be approved for graduation by the faculty.

Classification and Promotion

For clear promotion from year I to year II, students must complete a minimum of 27 credits. For promotion from year II to year III, students must complete a minimum of 58 credits. For promotion from year III to year IV, students must complete a minimum of 98 credits. All such credits should be from courses specified in the regular program.

Second BS Degree

To obtain a second BS in agriculture and the diploma of ingénieur agricole, non-FAFS students must complete:

- all AGRL III and AGRL IV courses, including all FAFS electives and Cultures and Histories courses. Applicants who have a BS degree in biology, chemistry, or environmental health do not need to take any additional prerequisite courses.
- at least five terms of residency at FAFS.

Holders of BS degrees from other majors will be required to complete additional prerequisite courses as recommended by the Admissions Committee and approved by the Academic and Curriculum Committee for holders of BS degrees other than the above-mentioned majors.

To obtain a second BS in agriculture and the diploma of ingénieur agricole, agribusiness students must complete:

- a minimum of 53 credit hours.
- a minimum residency period of two terms and the following course requirements.

List of Required Courses for Second BS Agribusiness Students

Term	Credit hours	Courses
Fall	15	AGSC 220 (Principles of Plant Physiology), AGSC 230 (Crop Systems), AGSC 233 (Plant Health I), AVSC 243 (Genetics and Biotechnology), AVSC 275 (Anatomy and Physiology of Farm Animals)
Spring AREC	16	AGSC 222 (Farm Practices,) AVSC 223 (Livestock Systems), AGSC 244 (Agricultural Water Technologies), AGSC 245 (Plant Health II), AGSC 246 (Intensive Agriculture), AGSC 250 (Organic Farming)
Summer AREC	7	AGSC 223 (Agricultural Project and Entrepreneurship), AGSC 235 (Agricultural Extension in Development), AGSC 247 (Farm Power and Alternative Energy)
Fall	15	AGSC 234 (Chemicals in Agriculture), AGSC 249 (GIS for Agriculture), AGSC 265 (Soil Fertility), two concentration courses in AGSC or AVSC
Total	**53**	

To obtain a second BS in agriculture and the diploma of ingénieur agricole, food science and management students must complete:

- a minimum of 53 credit hours.
- a minimum residency period of two terms and the following course requirements.

List of Required Courses for Second BS Food science and Management Students

Term	Credit hours	Courses
Fall	15	AGSC 207 (Land and Water Resources), AGSC 220 (Principles of Plant Physiology), AGSC 230 (Crop Systems), AGSC 233 (Plant Health I), AVSC 275 (Anatomy and Physiology of Farm Animals)
Spring AREC	16	AAGSC 222 (Farm Practices,) AVSC 223 (Livestock Systems), AGSC 244 (Agricultural Water Technologies), AGSC 245 (Plant Health II), AGSC 246 (Intensive Agriculture), AGSC 250 (Organic Farming)
Summer AREC	7	AGSC 223 (Agricultural Project and Entrepreneurship), AGSC 235 (Agricultural Extension in Development), AGSC 247 (Farm Power and Alternative Energy)
Fall	15	AGSC 234 (Chemicals in Agriculture), AGSC 249 (GIS for Agriculture), AGSC 265 (Soil Fertility), AVSC 271 (Animal Nutrition), one concentration course in AGSC or AVSC
Total	**53**	

Eligibility for the Regular AREC Program

To be eligible to enroll in the regular program at AREC during the third year of agriculture, students must:

- complete a minimum of 58 credits by the end of the first term of Agriculture III with a cumulative GPA of 2.3 or higher and must not have accumulated more than 12 credits of failed and/or missed courses (of which no more than 6 credits are failed courses) specified in the regular program.
- be approved for such action by the Academic and Curriculum Committee.

Elective Courses

Candidates for the degree of BS in agriculture must complete 21 credits of elective courses: 9 credits of concentration courses in FAFS, 6 credits in the Cultures and Histories, 3 credits in Human Values, and 3 credits in Societies and Individuals.

Curriculum for the BS Degree in Agriculture and Diploma of Ingénieur Agricole

A minimum of 128 credits are required for graduation.

Year 1

First Term		Credits
AGSC 205	The Food Odyssey (Cultures and Histories)	3
BIOL 200	Diversity of Life (Understanding the World)	4
CHEM 208	Brief Survey of Organic Chemistry	3
ENGL 203	Academic English	3
CMPS 209	Computers and Programming for the Sciences	3
		Total 16

Second Term		Credits
ARAB	Understanding Communication - Arabic	3
NFSC 261	Introductory Biochemistry	3
AGSC 206	Agriculture and the Environment	3
MATH 204 or 201	Mathematics for Social Sciences II (Quantitative Reasoning)	3
ENGL 204	Advanced Academic English	3
		Total 15

Year II

First term		**Credits**
AGSC 212	Microeconomic Theory of Food and Farming (Societies and Individuals)	3
AGSC 207	Land and Water Resources	3
AVSC 275	Anatomy and Physiology of Farm Animals	3
AVSC 243	Genetics and Biotechnology	3
AGSC 220	Principles of Plant Physiology	3
		Total 15

Second term		**Credits**
STAT 210/ NFSC 210	Elementary Statistics for the Sciences/ Statistics in Nutrition and Food Sciences	3
AVSC 224	Agricultural Microbiology	3
AGBU 213	Legal and Policy Aspects of the Agriculture Sector	3
AGSC 225	Rural Community Development	3
Cultures and Histories Elective (History of Ideas)		3
		Total 15

Year III

First term		**Credits**
AGSC 230	Crop Systems	3
AGSC 233	Plant Health I	3
AGSC 234	Chemicals in Agriculture	3
AVSC 252	Conservation Agriculture	3
AGBU 240	Career Planning Workshop for Agribusiness	0
Human Values Elective		3
		Total 15

Second term (AREC)		**Credits**
AGSC 222	Farm Practices	1
AGSC 244	Agricultural Water Technologies	3
AGSC 245	Plant Health II	3
AGSC / AVSC 250	Organic Farming	3
AVSC 223	Livestock Systems	3
AGSC 246	Intensive Agriculture	3
AGBU 256	Summer Internship	1
		Total 17

Summer term (AREC)		**Credits**
AGSC 223	Agricultural Project and Entrepreneurship	2
AGSC 247	Farm Power and Alternative Energy	3
AGSC 235	Agricultural Extension in Development	2
		Total 7

Year IV

First term		Credits
AGSC 249	GIS for Agriculture	3
AGSC 257	Emerging Issues in Agriculture: Networking with the Private Sector	1
AVSC 271	Animal Nutrition	3
AGSC 265	Soil Fertility	3
AGSC 298A	Capstone Course: From Seed to Table	0
Societies and Individuals Elective		3
		Total 13

Second term		Credits
AGSC/AVSC	Concentration Courses Sciences	9
AGSC 298B	Capstone Course: From Seed to Table	3
Cultures and Histories Elective		3
		Total 15

Course Descriptions

Core Courses for the BS Degree in Agriculture

AGSC 205 The Food Odyssey 3.0; 3 cr.
The course will take the students through the journey of food systems evolution from pre-historic times to the present day and a glimpse into the future. Students who receive credit for AGSC 205 cannot receive credit for AGSC 105.

AGSC 206 Agriculture and the Environment 3.0; 3 cr.
This course will introduce students to the subject of the impact of agricultural processes on the environment. It will discuss nutrient cycling and the various agricultural activities that lead to losses of nutrients and agricultural pollutants to the environment. The course will cover agricultural activities that contribute to climate change, buffer zones between agriculture and its environment, and mitigation strategies.

AGSC 207 Land and Water Resources 2.3; 3 cr.
Global soil and water resources and their current rates of degradation. The main processes of degradation (erosion, loss of organic matter, salinization, pollution) and their causes; consequences of degradation and conservation of resources through improved land use practices. Causes, influences and mitigation measures; water use and supply management for sustainable agriculture.

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. Students cannot receive credit for both AGSC 212 and ECON 211; the two courses will be treated as 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. Students cannot receive credit for both AGSC 220 and BIOL 270; the two courses will be treated as equivalent.

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 and Entrepreneurship 0.6; 2 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 225 Rural Community Development 3.0; 3 cr.
Students will gain an introduction to the concepts and models of community development. They will be able to identify the consequences of development strategies for social, economic, and environmental well-being, focusing on the interrelationships of these aspects of development. Students will be introduced to strategies to identify capacity and resources available in communities and those that need to be enhanced.

AGSC 230 Crop Systems 3.0; 3 cr.
This course aims to provide students with an understanding of the scientific basis of crop production. These include broad-area agronomy cropping and horticulture. In this course students will gain an understanding of the basic physiological controls on crop yield.

AGSC 233 Plant Health I 2.3; 3 cr.
Students will be introduced to major plant pests covering viruses, bacteria, fungi, phytoplasma, nematodes, weeds and insects and their management.

AGSC 245 Plant Health II 2.3; 3 cr.
Students will be introduced to major plant pests covering viruses, bacteria, fungi, phytoplasma, nematodes, weeds and insects and their management. Prerequisite: AGSC 233.

AGSC 234 Chemicals in Agriculture 3.0; 3 cr.
In this course you will review some of the old pesticides that were prohibited and focus on novel pesticides which are more environmentally friendly. The development of pesticides, their chemical composition, toxicity, formulation, mode of action, agricultural and urban uses, safe handling, international laws, metabolism and fate in the environment will be covered. While this course will focus on pesticides used in agriculture it will also cover major pesticides used in public health.

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; it examines principles and methods of extension and adult teaching. Prerequisite: AGSC 225.

AGSC 244 Agricultural Water Technologies 2.3; 3 cr.
This course deals with the practice of irrigation as a green technology with promising effects. Emphasis is given on smart irrigation systems from soil moisture measurement and monitoring to controllers and automated irrigation techniques based on weather sensing. Methods to calculate water requirements and determining application rates and irrigation schedules will be taught. Innovations in drip, sprinkler, and surface irrigation practices will be stressed. Prerequisites: AGSC III standing and eligibility for enrollment in the regular program at AREC.

AGSC 246 Intensive Agriculture 2.3; 3 cr.
This course introduces the students to the bases of intensive plant and animal production in terms of resource use, mechanization, technology, management, and environmental impact. Prerequisites: AGSC III standing and eligibility for enrollment in the regular program at AREC.

AGSC 247 Farm Power and Alternative Energy 2.3; 3 cr.
The course focuses on the study of internal combustion engines, power trains, and safe operation of tractors. The course explores the relationships between renewable energy and agriculture with an emphasis on biofuels, wind energy and hydropower. Prerequisites: AGSC III standing and eligibility for enrollment in the regular program at AREC.

AGSC 249 GIS for Agriculture 2.3; 3 cr.
Basic introduction to geographical information systems with emphasis on applications to agriculture; GIS data types, editing GIS data, spatial data analysis, and GPS collection; basic concepts and techniques of map analysis and the way these are used in geographical information systems in general and desktop GIS in particular. The major areas of practical application of GIS in agriculture; data and principles of sampling and modeling; computer skills for GIS software.

AGSC/AVSC 250 Organic Farming 2.3; 3 cr.
The course explores advances in organic farming and growing systems with an emphasis on farm planning, certification, marketing, information, and organic farming practices. Prerequisites: AGSC III standing and eligibility for enrollment in the regular program at AREC.

AGSC 252 Conservation Agriculture 3.0; 3cr.
This course will introduce students to the concept of conservation agriculture, which is a management system that integrates the use of soil, water, and biological resources. It will discuss soil properties, crop rotations, crop diversification, nutrient cycling, soil management, cover cropping, and soil inputs. The course will cover the benefits and challenges of conservation agriculture. The concept and link of soil health and sustainability with conservation agriculture will be discussed. Prerequisite: AGSC 207.

AGSC 257 Emerging Issues in Agriculture: Networking with the Private Sector 0.6; 1 cr.
The course is student centered. It relies on developing and delivering four main written /oral scientific communication items: report outline, abstract, report and an oral presentation. The students select a topic of their choice to work on throughout the term under the supervision of a chosen adviser and the course instructor.

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 207.

AGSC 298A Capstone Course: From Seed to Table 0.3; 0 cr.
This course offers students an opportunity to demonstrate integrated knowledge of the courses that were provided by the curriculum of the chosen major.

AGSC 298B Capstone Course: From Seed to Table 2.3; 3 cr.
This course offers students an opportunity to demonstrate integrated knowledge of the courses that were provided by the curriculum of the chosen major. Prerequisite: AGSC 298A.

AGBU 213 Legal and Policy Aspects of the Agriculture Sector 3.0; 3cr.
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 standing.

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 standing.

AGBU 256 Summer Internship 0.6; 1 cr.
Summer Internship.

AVSC 223 Livestock Systems 2.3; 3 cr.
In this course the students will be presented with the different animal systems. The major characteristics of each will be defined in relation to environmental impact and adaptation to different climates, animal welfare, economics, and productivity. Prerequisites: AGSC III standing and eligibility for enrollment in the regular program at AREC.

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/AGSC 243 Genetics and Biotechnology 3.0; 3 cr.
This course is an introduction to the fundamental principles of genetics, molecular biology and biotechnology. Following description of cell multiplication and trait inheritance and segregation according to Mendelian genetics, the course will focus on DNA and gene regulation, transcription, translation, gene expression, mutation, and DNA recombination with a brief description of current molecular techniques. The important applications of biotechnology in the field of agriculture will be discussed including transgenic organisms, marker assisted selection, and transformed microorganisms for genetic improvement. Students cannot receive credit for both AVSC 243 and BIOL 223; the two courses will be treated as equivalent.

AVSC 271 Animal Nutrition 3.0; 3 cr.
Structure and functioning of digestive systems of livestock and poultry; bioenergetics, nutritional deficiencies, and nutrient requirements of farm animals.

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

NFSC 210 Statistics in Nutrition and Food Sciences 2.3; 3 cr.
An introduction to the study of statistics as it applies to nutrition and food sciences. Topics include both descriptive and inferential statistics: samples, population, and types of data; organizing and graphing data; numerical descriptive measures; probability; discrete random variables and their probability distributions; continuous random variables and the normal distribution; point and interval estimation and hypothesis testing; correlation and simple linear regression; Chi-Square tests. Students will learn to use the computer package SPSS for statistical analysis. Students cannot receive credit for NFSC 210, STAT 201, STAT 210, STAT 230, ECON 213 or EDUC 227.

NFSC 261 Introductory Biochemistry 3.0; 3 cr.
The course focuses on the study of the chemistry of biological compounds, their enzymatic degradation and intermediary metabolism. Prerequisite: CHEM 208.

Concentration Courses

Sustainable Agriculture (Organic/Conservation)

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 251 Vegetable Production 3.0; 3 cr.
The course introduces students in the Agriculture program to 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 students in understanding different vegetable crop production techniques used in Lebanon and worldwide.

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 203 and AGSC 212.

AGSC 270 Principles of Integrated Farming 3.0; 3 cr.
Introduces the students to modern sustainable farming systems including permaculture landscaping, agroforestry, aquaculture in combination with animal and plant farming, nutrient cycles, crop residue and manure management, grazing systems and multi species interactions, the environmental and economic impact of these systems and their management will be addressed.

AGSC 272 Natural Control of Plant Pests 3.0; 3 cr.
The principles and practices of using natural enemies and antagonists within integrated pest management strategies to manage plant pests (insects, mites, pathogens, and weeds) to reduce crop losses. Pest management of major vegetables, fruit tree crops and cereals will be covered. Prerequisites: AGSC 233 and AGSC 245 or consent of instructor.

AGSC 273 The Energy-Water-Food Nexus 3.0; 3 cr.
Energy, water, and food are linked, where water is the major component of crop production and energy is needed for water supply through pumps and for food distribution. This course aims at exploring the link and explaining the connection between these three components.

AGSC 274 Agricultural Biotechnology 2.3; 3 cr.
This course aims to teach students the modern technology advancements in the field of agriculture from plant and animal biotechnology, to breeding and genetics.

AVSC 242 Small Ruminant Production in Arid Regions 3.0; 3 cr.
The course explores breeding, feeding and management of sheep and goats under arid conditions.

Agricultural Technology

AGSC 274 Agricultural Biotechnology 3.0; 3 cr.
This course aims to teach students the modern technology advancements in the field of agriculture from plant and animal biotechnology, to breeding and genetics.

AGSC 283 Precision Farming and Agricultural Technology 3.0; 3 cr.
The course covers essential aspects of precision agriculture concepts including soil/ landscape and crop spatial variability; new technologies; GIS, DEM, GPS, sensors, special software, remote sensing; geostatistics, sampling, experimental designs; precision integrated crop management; variable rate technologies; data acquisition, processing, and management.

Elective Courses

AGSC 105 History of Food and Food Systems 3.0; 3 cr.
The course will take the students through the journey of food systems evolution from pre-historic times to the present day and a glimpse into the future. Students who receive credit for AGSC 105 cannot receive credit for AGSC 205. Elective.

AGSC 201 Orientation to Agriculture and Food Systems 2.0; 2 cr.
This course provides students with basic introductory knowledge of 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 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 278 Floriculture 2.3; 3 cr.
This course will explore the different basic cultural and production requirements in the field of floriculture in theory and practice. Also, production methods for different species in the special categories of production, such as flower potted plants and interior plants, cut flowers and bedding plants. A general outlook on soil media, environmental influence, and techniques in propagation, and controlling plant development, will be discussed besides structures and greenhouse management.

AGSC 286 The Fruitful Branches: Grapevine and Olive 3.0; 3 cr.
This course explores facts on grape and olive production and distribution around the world and particularly in Lebanon in addition to 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 293 Integrated Plant Health Management for Economic Crops 3.0; 3 cr.
The course focuses on 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. Prerequisite: consent of instructor.

AGSC 294 Applied Plant Protection 2.3; 3 cr.
The course explores observations and study of major insect pests and plant diseases on field and greenhouse crops with emphasis on recognition, identification, and management. Prerequisite: consent of Instructor.

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 3.0; 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; 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 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/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; and 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 healthcare 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 explores 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.

BS in Agribusiness

The BS in agribusiness is a three-year cross-disciplinary program designed to provide students with comprehensive knowledge in the decision-making processes of business and the technical aspects of modern agriculture and food systems. Graduates of this program do not receive the diploma of ingénieur agricole.

Graduation Requirements

To be eligible for graduation with the degree of BS in agribusiness (AGBU), students must:

- complete a minimum of 97 term credit hours for the NTDT program: 97 term credit hours for the FSMT program and 96 term credit hours for the AGBU.
- complete a minimum of six terms of residency.
- achieve an overall minimum average grade of C+ (GPA 2.3).
- be approved for graduation by the faculty.

Classification and Promotion

For clear promotion from year I to year II, students must complete a minimum of 30 credits. For promotion from year II to year III, students must complete a minimum of 60 credits. All such credits should be from courses specified in the regular program.

Second BS Degree

To obtain a second BS in agribusiness, students must complete:

- a minimum of 54 credits while registered in FAFS, including all AGBU II and AGBU III required core courses listed in this catalogue (of which up to 15 credits can be from transferred course credits).
- additional prerequisite courses as recommended by the Admissions Committee and approved by the Academic and Curriculum Committee.

Minor in Agribusiness

The courses required for a minor in agribusiness are AGBU 210/MKTG 210, AGBU 213, AGBU 229 or AGBU 236, AGBU 239, AGBU 240, AGBU 248/INFO 200, and AGBU 292.

Elective Courses

Candidates for the degree of BS in agribusiness must also complete 9 credits in Cultures and Histories and 3 credits in Human Values.

Curriculum for the BS Degree in Agribusiness

A minimum of 96 credits are required for graduation.

Agribusiness I

First Term		Credits
AGSC 204	Natural Sciences for Agribusiness (Understanding the World)	3
AGBU 211	Introduction to Agricultural Issues and Policies	3
CMPS 209	Computers and Programming for the Sciences (Quantitative Reasoning)	3
ENGL 203	Academic English	3
MATH 204	Mathematics for Social Sciences II (Quantitative Reasoning)	3
		Total 15

Second Term		Credits
ACCT 210	Financial Accounting	3
AGSC 207	Land and Water Resources	3
AGSC 203	Crop Production and Protection	3
ARAB	Understanding Communication - Arabic	3
ENGL 204	Advanced Academic English	3
		Total 15

Agribusiness II

First term		Credits
ACCT 215	Management Accounting	3
AGSC 212	Microeconomics Theory of Food and Farming (Societies and Individuals)	3
AGBU 239	Agribusiness Communication Skills Workshop	0
NFSC 252	Food Processing	3
NFSC 210	Statistics in Nutrition and Food Sciences	3
Human Values Elective	To be chosen from PHIL 206 or PHIL 209	3
		Total 15

Second term		Credits
AGBU 210	Marketing in Agribusiness	3
ECON 212	Elementary Macroeconomic Theory (Societies and Individuals)	3
AGSC 253	Harvest and Post-harvest Issues and Strategies	3
AGBU 255	Field Study of the Rural Agro-economy (Community Engaged Learning)	3
AVSC 220	Livestock Production (Understanding the World)	3
		Total 15

Summer term		Credits
AGBU 229	Entrepreneurship in Agriculture (Theory + Project)	3
AGBU 256	Summer Internship	1
		Total 4

Agribusiness III

First term		Credits
AGBU 236	New Trends in Agricultural and Food Systems	3
AGBU 240	Career Planning Workshop for Agribusiness	0
FINA 210	Business Finance	3
INFO 200	Foundations of Information Systems	3
MNGT 215	Fundamentals of Management and Organizational Behavior	3
Cultures and Histories (History of Ideas) Elective		3
		Total 15

Second term		Credits
AGBU 213	Legal and Policy Aspects of the Agriculture Sector	3
AGBU 248	Operation Management for Agribusiness	3
AGBU 292	Agribusiness Final Year Project (capstone course)	5
Cultures and Histories Elective		3
Cultures and Histories Elective		3
		Total 17

Core Courses for BS in Agribusiness

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. Students cannot receive credit for both AGBU 210 and MKTG 210; the two courses will be treated as equivalent. Prerequisite: junior 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.

AGBU 213 Legal and Policy Aspects of the Agriculture Sector 3.0; 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 standing.

AGBU 229 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 standing.

AGBU 236 New Trends in Agricultural and Food Systems 3.0; 3 cr.
The course explores current trends in agricultural production and trade, developments in private sector markets and in public policy, and the concerns related to the effects of agricultural production and 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-strict 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 standing.

AGBU 248 Operation Management for Agribusiness 3.0; 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. Students cannot receive credit for both AGBU 248 and DCSN 200; the two courses will be treated as equivalent. Prerequisite: senior standing.

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 of observing 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 203 and AGSC 207.

AGBU 256 Summer Internship 0.6; 1 cr.
Summer Internship.

AGBU 292 Agribusiness Final Year Project 5.0; 5 cr.
This is a milestone capstone course for students in Agribusiness that emphasizes the 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. Through the course, students develop teambuilding as well as written and oral communication skills. Prerequisite: senior standing.

AGSC 203 Crop Production and Protection 2.3; 3 cr.
The course provides an overview of the technologies used in the production of crops. Students 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. Prerequisite: AGSC 204.

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.

AGSC 207 Land and Water Resources 2.3; 3 cr.
Global soil and water resources and their current rates of degradation. The main processes of degradation (erosion, loss of organic matter, salinization, pollution) and their causes; consequences of degradation and conservation of resources through improved land use practices. Causes, influences and mitigation measures; water use and supply management for sustainable agriculture.

AGSC 212 Microeconomic Theory of Food and Farming 3.0; 3 cr.
The course introduces economic principles which are 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.

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 203, AGSC 207, and AGSC 212.

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 students to the modern management practices required for the production of economically beneficial avian species including domestic chickens, turkeys, waterfowls, game birds and others. The third section discusses the nature of economic diseases in domestic animals and avian species and the regulations of the World Trade Organization in the import and export of animals, including rules that prevent the trans-boundary transmission of microbes causing economic diseases.

NFSC 210 Statistics in Nutrition and Food Sciences 2.3; 3 cr.
An introduction to the study of statistics as it applies to nutrition and food sciences. Topics include both descriptive and inferential statistics: samples, population, and types of data; organizing and graphing data; numerical descriptive measures; probability; discrete random variables and their probability distributions; continuous random variables and the normal distribution; point and interval estimation and hypothesis testing; correlation and simple linear regression; Chi-Square tests. Students will learn to use the computer package SPSS for statistical analysis. Students cannot receive credit for NFSC 210, STAT 201, STAT 210, STAT 230, ECON 213 or EDUC 227.

NFSC 252 Introduction to Food Processing 3.0; 3 cr.
Technology and processing of foods; includes different technologies applied to preserve and process food from post-harvest stages to being ready for consumption. Processing methods covered relate to cereals, dairy products, meat, poultry, fats and oils, fermentation, fruits, and vegetables, as well as beverages.

Department of Nutrition and Food Sciences (NFSC)

Chairperson	Obeid, Omar
Professors	Abiad, Mohammad; Hwalla, Nahla; Kharroubi, Samer (Associate Dean of Student Affairs); Nasreddine, Lara; Obeid, Omar; Olabi, Ammar; Toufeili, Imad
Adjunct Professor	Naja, Farah
Adjunct Associate Professor	Jomaa, Lamis
Assistant Professors	Fares, Elie Jacques; Iskandar, Christelle
Assistant Professor of Practice	Chamieh, Marie Claire
Visiting Assistant Professor	Ouaijan, Krystel
Assistant Research Professor	Habib Mourad, Carla
Instructors	Daroub, Hamza; Hamzeh, Reem;

The mission of the Department of Nutrition and Food Sciences is to produce qualified graduates capable of serving the region in various areas of food science, nutrition, and dietetics. The department participates in offering courses within the Faculty of Agricultural and Food Sciences (FAFS) undergraduate core program and additionally offers junior and senior courses that cover areas of major importance in food science, nutrition, and dietetics. The department offers two three-year programs, one leading to a BS degree in nutrition and dietetics (NTDT) and the other leading to a BS degree in food science and management. Graduates wishing to qualify as licensed dietitians should complete an internship for a minimum of six months in a recognized medical setting.

BS in Food Science and Management

This is a specialized three-year program offered by FAFS to prepare graduates to satisfy the needs of food industries and establishments in the region. Graduates of this program do not receive the diploma of ingénieur agricole.

Graduation Requirements

To be eligible for graduation with the degree of BS in food sciences and management (FSMT), students must:

- complete a minimum of 97 term credit hours for the FSMT program.
- complete a minimum of six terms of residency.
- achieve an overall minimum average grade of C+ (GPA 2.3).
- be approved for graduation by the faculty.

Classification and Promotion

For clear promotion from year I to year II, students must complete a minimum of 30 credits. For promotion from year II to year III, students must complete a minimum of 63 credits. All such credits should be from courses specified in the regular program.

Second BS Degree

To obtain a second BS in food science and management, students must complete:

- a minimum of 53 credits while registered in FAFS, including all FSMT II and FSMT III required core courses listed in this catalogue (of which up to 15 credits can be from transferred course credits).
- additional prerequisite courses as recommended by the Admissions Committee and approved by the Academic and Curriculum Committee.
- at least three terms of residency at FAFS.

Minor in Food Science and Management

Students already working on a bachelor's degree outside food science and management (FSMT) and who wish to obtain a minor in FSMT must apply to the relevant minor before taking any course in the requested minor. The Department of Nutrition and Food Sciences evaluates all applicants for a minor and makes recommendations to the Academic and Curriculum Committee (ACC).

Students are eligible to be considered for a minor in food science and management after completing 24 credit hours in their major with a cumulative grade average of B, a GPA of 3.0. Students are required to complete a minimum of 16 credits for the minor. The courses are: NFSC 265, NFSC 278, NFSC 282, NFSC 288, MNGT 215, and MKTG 210. Additional courses may be required from agriculture and nutrition and dietetics students to replace required courses common to the major and minor and/or to fulfill prerequisite courses.

Elective Courses

Candidates for the degrees of BS in food sciences and management must complete a minimum of 9 credits in Cultures and Histories and 3 credits in Human Values. One elective should cover the theme of Social Inequalities.

Curriculum for the BS Degree in Food Science and Management

A minimum of 97 credits are required for Graduation.

Food Science and Management I

First Term		**Credits**
BIOL 200	Diversity of Life	4
CHEM 200	Basic Chemistry and Applications (Understanding the World)	3
CHEM 205	Introductory Chemistry Laboratory	2
ENGL 203	Academic English	3
MATH 204	Mathematics for Social Sciences II (Quantitative Reasoning)	3
		Total 15

Second Term		**Credits**
CHEM 208	Brief Survey of Organic Chemistry (Understanding the World)	3
CHEM 209	Introductory Organic Laboratory	2
ENGL 204	Advanced Academic English	3
AGSC 212	Microeconomics Theory of Food and Farming (Societies and Individuals)	3
NFSC 221	Basic Nutrition	3
Cultures and Histories (History of Ideas)		3
		Total 17

Food Science and Management II

First term		Credits
NFSC 210	Statistics in Nutrition and Food Sciences	3
NFSC 291	Elements of Food Engineering	3
NFSC 261	Introductory Biochemistry	3
NFSC 265	Food Chemistry	3
NFSC 267	Food Analysis	2
NFSC 277	Food Microbiology I	3
		Total 17

Second term		Credits
ACCT 210	Financial Accounting	3
ARAB	Understanding Communication - Arabic	3
CMPS 209	Computers and Programming for the Sciences	3
NFSC 272	Introduction to Food Service and Industries (Community Engaged Learning)	2
NFSC 282	Food Quality Management	3
Human Values Elective		3
		Total 17

Summer term		Credits
NFSC 280	Summer Training in Food Establishments	1
		Total 1

Food Science and Management III

First term		Credits
ACCT 215	Management Accounting	3
NFSC 278	Food Microbiology II	3
NFSC 288	Technology of Food Products	3
FINA 210	Business Finance	3
NFSC 299A	Projects in Nutrition and Food Sciences	0
Cultures and Histories Elective		3
		Total 15

Second term		Credits
MKTG 210	Principles of Marketing	3
NFSC 287	Food Processing	2
NFSC 289	Food Processing Lab	1
MNGT 215	Fundamentals of Management and Organizational Behavior	3
NFSC 296	Current Topics in Food Sciences and Nutrition	1
NFSC 299B	Projects in Nutrition and Food Sciences	2
Cultures and Histories Elective		3
		Total 15

Core Courses for the BS Degree in Food Science and Management (FSMT)

NFSC 210 Statistics in Nutrition and Food Sciences 2.3; 3 cr.
An introduction to the study of statistics as it applies to nutrition and food sciences. Topics include both descriptive and inferential statistics: samples, population, and types of data; organizing and graphing data; numerical descriptive measures; probability; discrete random variables and their probability distributions; continuous random variables and the normal distribution; point and interval estimation and hypothesis testing; correlation and simple linear regression; Chi-Square tests. Students will learn to use the computer package SPSS for statistical analysis. Students cannot receive credit for NFSC 210, STAT 201, STAT 210, STAT 230, ECON 213, or EDUC 227.

NFSC 221 Basic Nutrition 3.0; 3 cr.
The course is a survey of nutrients, including their food sources, digestion, metabolism, functions, and requirements in humans.

NFSC 261 Introductory Biochemistry 3.0; 3 cr.
The course focuses on the chemistry of biological compounds, their enzymatic degradation and intermediary metabolism. Prerequisite: CHEM 208.

NFSC 265 Food Chemistry 3.0; 3 cr.
The course focuses on the study of the chemical composition and physical and sensory properties of foods. Prerequisite: CHEM 208.

NFSC 267 Food Analysis 1.3; 2 cr.
The course exposes students to laboratory methods for chemical analysis of nutrients and chemicals in food products. Prerequisites: CHEM 205 and CHEM 209. Pre/corequisite: NFSC 265.

NFSC 272 Introduction to Food Service and Industries 1.3; 2 cr.
The course is an introduction to food service and the food industry. This course explains the food chain system and describes the food service institutions and different food industries; it also includes visits to different institutions in the food chain. Prerequisites: junior status, FSMT II. Spring.

NFSC 277 Food Microbiology I 3.0; 3 cr.
It is a survey of microorganisms and their role in causing food spoilage and food poisoning, and the control of microbial spoilage and pathogenic microorganisms in foods.

NFSC 278 Food Microbiology II 2.3; 3 cr.
The course focuses on the study of the microbiological aspects of food preservation; beneficial utilization of microorganisms in food applications; detection of microbial contamination and hazards of importance to public health. Prerequisite: NFSC 277. Fall.

NFSC 280 Summer Training in Food Establishments 1 cr.
The course involves students in supervised training in one of the food service institutions or food industries. Prerequisites: NFSC 272 and NFSC 282. Summer.

NFSC 282 Food Quality Management 3.0; 3 cr.
The course covers basic principles of food quality control, quality assurance, and quality management in food service establishments and food industries; emphasis on modern concepts such as HACCP, ISO 9000, and Good Manufacturing Practice. Spring.

NFSC 287 Food Processing 2.0; 2 cr.
The course focuses on the principle of food spoilage, food preservation and the different methods of food processing. Prerequisites: NFSC 265, and NTDT III or FSMT III.

NFSC 288 Technology of Food Products 2.3; 3 cr.
The course focuses on technology and preservation methods of food products. It also includes laboratory exercises in the pilot plant in food preservation, processing, and quality control testing. Prerequisites: FSMT III, AGRL IV, NTDT III, or NDCP III.

NFSC 289 Food Processing Laboratory 0.3; 1 cr.
The course involves students in laboratory exercises in the pilot plant in food preservation, preparation, and processing. Pre/corequisite: NFSC 287. Prerequisites: NTDT III, NDCP III or FSMT III.

NFSC 291 Elements of Food Engineering 3.0; 3 cr.
Basic concepts and principles of food engineering; emphasis on food handling and unit operations utilized in food processing. Prerequisites: MATH 204 and FSMT II. Fall.

NFSC 296 Current Topics in Food Sciences and Nutrition 1 cr.
Seminar presentation on current topics in food sciences and nutrition. Prerequisite: FSMT III.

NFSC 299A Projects in Nutrition and Food Sciences 0 cr.
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that is designed to introduce the students to the skills necessary to execute research projects in their academic discipline. Prerequisite: NTDT or FSMT III. Fall.

NFSC 299B Projects in Nutrition and Food Sciences 2 cr.
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that complements NFSC 299A. It is designed to help guide the students execute a project in their academic discipline. Prerequisites: NFSC 210, NFSC 299A, CITI.

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. Students cannot receive credit for both AGSC 212 and ECON 211; the two courses will be treated as equivalent.

BS in Nutrition and Dietetics (NTDT)

This is a three-year program, which will lead to a BS degree in nutrition and dietetics (NTDT). The NTDT's mission statement is to enhance the nutritional well-being and health of individuals, families, and populations through the promotion of scholarship in human nutrition and dietetics. The program is science-oriented, student-centered, and committed to excellence in teaching, training, research, and outreach service. The core values encompass the development of human potential and provide a collegial environment that fosters the professional growth of students for a career in nutrition and dietetics. This diverse and dynamic profession integrates human nutrition, food service administration, food science, biology, chemistry, physiology, and interpersonal skills.

Graduation Requirements

To be eligible for graduation with the degree of BS in nutrition and dietetics (NTDT), students must:

- complete a minimum of 97 term credit hours for the NTDT program.
- complete a minimum of six terms of residency.
- achieve an overall minimum average grade of C+ (GPA 2.3).
- be approved for graduation by the faculty.

Classification and Promotion

For clear promotion from year I to year II, students must complete a minimum of 30 credits. For promotion from year II to year III, students must complete a minimum of 63 credits. All such credits should be from courses specified in the regular program.

Second BS Degree

To obtain a second BS in nutrition and dietetics, students must complete:

- a minimum of 52 credits while registered at FAFS, including all NTDT II and NTDT III required core courses listed in this catalogue (of which 15 credits can be transferred course credits).
- additional prerequisite courses as recommended by the Admissions Committee and approved by the Academic and Curriculum Committee.
- at least three terms of residency at FAFS.

Minor in Nutrition and Dietetics

Students already working on a bachelor's degree outside nutrition and dietetics (NTDT) and who wish to obtain a minor in NTDT must apply to the relevant minor before taking any course in the requested minor. The Department of Nutrition and Food Sciences evaluates all applicants for a minor and makes recommendations to the Academic and Curriculum Committee (ACC).

Students are eligible to be considered for a minor in nutrition and dietetics major after completing 24 credit hours in their major with a cumulative grade average of B, a GPA of 3.0. Students are required to complete a minimum of 16 credits for the minor. The courses are: NFSC 221, NFSC 222, NFSC 240, NFSC 265, NFSC 274, NFSC 285, and NFSC 281. Additional courses may be required from agriculture and food Sciences and management students to replace required courses common to the major and minor and/or to fulfill prerequisite courses.

Transfers

Transfer from Other Faculties at AUB to NTDT

Students enrolled at other faculties at AUB may apply for a transfer to the NTDT Program. To be eligible for an internal transfer, applicants must:

- have completed at least 24 sophomore credits.
- not be on probation.
- and have achieved a minimum overall cumulative GPA of 3.0.

Applications of transfer students are evaluated and approved by the Department of Nutrition and Food Sciences (NFSC) and the Admission Committee of the faculty. Admission into the program is by selection of the most promising eligible applicants. Top ranking students of the applying pool of students will be selected based on the number of available places in the NTDT for the term in question.

Upon approval of transfer, the student's complete program of study and course requirements are determined by the department.

Transfer from Other Universities to NTDT

Students currently pursuing an undergraduate degree at another university in Lebanon or abroad may apply for transfer to the NTDT Program. To be eligible for admission to AUB and the NTDT Program, applicants must:

- be transferring from an appropriately accredited university or institution of higher education recognized by AUB.
- have successfully completed at least 30 sophomore credits.
- and have achieved a minimum overall cumulative average equivalent to the AUB GPA of 3.0.

Applications of transfer students from other universities are evaluated and approved by the Department of Nutrition and Food Sciences (NFSC) and the Admission Committee of the faculty. Admission into the program is by selection of the most promising eligible applicants. Top ranking students of the applying pool of students will be selected based on the number of available places in the NTDT for the term in question.

As stated in the General University Academic Information section of the catalogue, applicants should meet the Readiness for University Studies in English before registration.

Upon approval of transfer, the students' complete program of study and course requirement is determined by the department. Transfer of courses from other universities is the prerogative of the NFSC department.

Elective Courses

Candidates for the degrees of BS in nutrition and dietetics must complete a minimum of 9 credits in Cultures and Histories and 3 credits in Human Values.

Curriculum for the BS Degree in Nutrition and Dietetics (NTDT)

A minimum of 97 credits are required for Graduation.

NTDT I

First term		Credits
BIOL 201	General Biology I	4
CHEM 200	Basic Chemistry and Applications (Understanding the World)	3
CHEM 205	Introductory Chemistry Laboratory	2
ENGL 203	Academic English	3
NFSC 221	Basic Nutrition	3
		Total 15

Second term		Credits
CHEM 208	Brief Survey of Organic Chemistry (Understanding the World)	3
CHEM 209	Introductory Organic Laboratory	2
ENGL 204	Advanced Academic English	3
PHYL 246	Physiology for Nursing Degree Students and Undergraduates	4
PSYC 201	Introduction to Psychological Science	3
		Total 15

NTDT II

First term		Credits
AGSC 212	Microeconomics Theory of Food and Farming (Societies and Individuals)	3
NFSC 274	Human Nutrition and Metabolism	3
NFSC 290	Food Service Management	3
NFSC 261	Introductory Biochemistry	3
NFSC 240	Nutrition Status Assessment	2
MNGT 215	Fundamentals of Management and Organizational Behaviors (Societies and Individuals)	3
		Total 17

Second term		Credits
ARAB	Understanding Communication - Arabic	3
NFSC 285	Nutrition in the Life Cycle	2
NFSC 281	Nutrition in the Life Cycle Lab for NTDT	1
NFSC 265	Food Chemistry	3
NFSC 267	Food Analysis	2
NFSC 229	Menu Planning	1
Cultures and Histories (History of Ideas)		3
		Total 15

NTDT III

First term		Credits
NFSC 210	Statistics in Nutrition and Food Sciences	3
NFSC 222	Community Nutrition (Community Engaged Learning)	3
NFSC 277	Food Microbiology	3
NFSC 292	Medical Nutrition Therapy I	3
NFSC 294	Medical Nutrition Therapy Lab I for NTDT	1
NFSC 299A	Projects in Nutrition and Food Sciences	0
Cultures and Histories Elective		3
		Total 16

Second term		Credits
CMPS 209	Computers and Programming for the Sciences (Quantitative Reasoning)	3
NFSC 287	Food Processing	2
NFSC 289	Food Processing Lab	1
NFSC 293	Medical Nutrition Therapy II	3
NFSC 295	Medical Nutrition Therapy Lab II for NTDT	1
NFSC 296	Current Topics in Food Sciences and Nutrition	1
NFSC 299B	Projects in Nutrition and Food Sciences	2
Human Values Elective		3
Cultures and Histories Elective		3
		Total 19

Core Courses for the BS Degree in Nutrition and Dietetics (NTDT)

NFSC 210 Statistics in Nutrition and Food Sciences 2.3; 3 cr.
An introduction to the study of statistics as it applies to nutrition and food sciences. Topics include both descriptive and inferential statistics: samples, population, and types of data; organizing and graphing data; numerical descriptive measures; probability; discrete random variables and their probability distributions; continuous random variables and the normal distribution; point and interval estimation and hypothesis testing; correlation and simple linear regression; Chi-Square tests. Students will learn to use the computer package SPSS for statistical analysis. Students cannot receive credit for NFSC 210, STAT 201, STAT 210, STAT 230, ECON 213, or EDUC 227.

NFSC 221 Basic Nutrition 3.0; 3 cr.
The course is a survey of nutrients, including their food sources, digestion, metabolism, functions, and requirements in humans.

NFSC 222 Community Nutrition 3.0; 3 cr.
The course is an introduction to key concepts and current topics in community nutrition. The course discusses the role of nutrition in improving the health and well-being of communities and familiarizes students with population nutritional status assessment, principles of nutrition research, and factors involved in planning, implementing, and evaluating community nutrition programs and policies. Prerequisites: NFSC 221 and NFSC 285. Fall.

NFSC 229 Menu Planning 0.3; 1 cr.
The course explores the principles and techniques of menu planning for healthy people. Topics include nutrient needs for optimum health, dietary guidelines, food groups, food portion sizes and the use of exchange lists for meal planning and client nutrition education in both the English and Arabic languages. Prerequisites: NFSC 221 and NFSC 240. Spring.

NFSC 240 Nutritional Status Assessment 1.3; 2 cr.
The course exposes students to the theoretical basis of various aspects of nutritional assessment (counseling dietary assessment, anthropometric measurement, biochemical assays, and clinical assessment). The course also familiarizes students with nutritional status assessment tools and techniques through practical experimentation in the lab. Prerequisites: NFSC 221 and NFSC 274. Fall.

NFSC 261 Introductory Biochemistry 3.0; 3 cr.
The course focuses on the study of the chemistry of biological compounds, their enzymatic degradation and intermediary metabolism. Prerequisite: CHEM 208.

NFSC 265 Food Chemistry 3.0; 3 cr.
The course focuses on the study of the chemical composition and physical and sensory properties of foods. Prerequisite: CHEM 208.

NFSC 267 Food Analysis 1.3; 2 cr.
The course explores laboratory methods for chemical analysis of nutrients and chemicals in food products. Prerequisites: CHEM 205 and CHEM 209; pre/corequisite: NFSC 265.

NFSC 274 Human Nutrition and Metabolism 3.0; 3 cr.
The course explores human physiological needs for energy, carbohydrates, fats, proteins, vitamins, minerals, and control of nutrient metabolism. Prerequisites: NFSC 221, NFSC 261, and PHYL 246. Fall.

NFSC 277 Food Microbiology I 3.0; 3 cr.
The course is a survey of microorganisms and their role in causing food spoilage and food poisoning, and the control of microbial spoilage and pathogenic microorganisms in foods.

NFSC 281 Nutrition in the Life Cycle Lab for NTDT 0.3; 1 cr.
The course emphasizes practical applications of the principles of nutrition and human development in the context of normal physiological changes that occur throughout the life cycle. It includes evidence-based recommendations and interventions to improve nutrition status and food-related behaviors through the life cycle for individuals, groups, and populations. Prerequisites: NFSC 221 and NFSC 229. Corequisites: NFSC 274 and NFSC 285. Spring.

NFSC 285 Nutrition in the Life Cycle 2.0; 2 cr.
The course focuses on the basic nutritional needs of individuals throughout their life cycle: infancy, childhood, adolescence, adulthood and old age, and special nutritional requirements for pregnancy and lactation. Prerequisite: NFSC 221. Corequisite: NFSC 274. Spring.

NFSC 287 Food Processing 2.0; 2 cr.
The course focuses on the principle of food spoilage, food preservation and the different methods of food processing. Prerequisites: NFSC 265, and NTDT III or FSMT IIII.

NFSC 289 Food Processing Laboratory 0.3; 1 cr.
The course involves students in laboratory exercises in the pilot plant in food preservation, preparation, and processing. Pre/corequisite: NFSC 287. Prerequisites: NTDT III, NDCP III or FSMT III.

NFSC 290 Food Service Management 2.3; 3 cr.
The course explores techniques of management of functional operation of food service; field trips, self-study modules, reports, and discussion. Prerequisite: NFSC 221; pre/corequisite: MNGT 215.

NFSC 292 Medical Nutrition Therapy I 3.0; 3 cr.
The course examines selected metabolic diseases, HIV, and cancer by covering their etiology, metabolic pathways, and the importance of medical nutrition therapy. Prerequisites: NFSC 240, NFSC 274, and NFSC 285. Fall.

NFSC 293 Medical Nutrition Therapy II 3.0; 3 cr.
The course is a thorough review of the nutrition care process in the treatment of diet-related diseases. It prepares students to implement the nutrition care process for various conditions, including but not limited to overweight and obesity, diabetes, cardiovascular, gastrointestinal, and renal diseases; helps students understand the pathophysiology of selected diseases in which nutritional intervention plays a major role, identify the nutritional needs of patients with disease and develop an appropriate patient nutrition care plan. Prerequisites: NFSC 274, NFSC 240, and NSFC 285. Spring.

NFSC 294 Medical Nutrition Therapy Laboratory I for NTDT 0.3; 1 cr.
It is an intensive laboratory course designed to help students learn and practice the application of evidence-based medical nutrition therapy for diseases and disorders discussed in NFSC 292. This is done through the use of self-study modules, case studies, reports and discussions. Prerequisites: NFSC 240, NFSC 274, and NFSC 285. Corequisite: NFSC 292. Fall.

NFSC 295 Medical Nutrition Therapy Laboratory II for NTDT 0.3; 1 cr.
It is an intensive laboratory course designed to help students learn and practice the application of evidence-based medical nutrition therapy for diseases and disorders discussed in NFSC 293. This is done through the use of self-study modules, case studies, reports and discussions. Prerequisites: NFSC 240, NFSC 274, and NFSC 285. Corequisite: NFSC 293. Spring.

NFSC 296 Current Topics in Food Sciences and Nutrition 1 cr.
Seminar presentation on current topics in food sciences and nutrition. Prerequisite: NTDT III.

NFSC 299A Projects in Nutrition and Food Sciences 0 cr.
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that is designed to introduce the students to the skills necessary to execute research projects in their academic discipline. Prerequisite: NTDT or FSMT III. Fall.

NFSC 299B Projects in Nutrition and Food Sciences 2 cr.
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that complements NFSC 299A. It is designed to help guide the students execute a project in their academic discipline. Prerequisites: NFSC 210, NFSC 299A, CITI.

NFSC 298 Dietetic Internship 2 cr.
Supervised training of at least 6 months in all areas of dietetic practice, clinical, food service and community at an affiliated medical facility. Offered in spring for fall graduates and in summer for spring graduates and renewable until completion of internship duration.

BS in Nutrition and Dietetics Coordinated Program (NDCP)

This is a four-year program that leads to a BS degree in nutrition and dietetics coordinated program (NDCP). The program has a concentration in Medical Nutrition Therapy (MNT) and combines theoretical and experiential learning in nutrition and dietetics with at least 1035 hours of supervised practice in affiliated medical facilities. The proposed educational framework is based on the knowledge, skills, and core competencies established by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) for entry-level dietitians. Students are first admitted to the didactic nutrition and dietetics program and then apply to the NDCP towards the end of their sophomore year in nutrition and dietetics after the completion of at least 30 credits. AUB's NDCP has been granted candidacy for full accreditation status by the Accreditation Council for Education in Nutrition and Dietetics of the Academy of Nutrition and Dietetics, 120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995, (312) 899-0040 ext. 5400.
Website: https://www.eatrightpro.org/acend.

This verifies that the program is equivalent and comparable in content and experience to United States-based programs meeting the ACEND accreditation standards. The accreditation makes students eligible to sit for the Commission on Dietetic Registration (CDR) examination for dietitians in the United States to obtain the Registered Dietitian (RD) status after they earn a master's degree. The accreditation also allows students, who successfully complete the curriculum within the NDCP program to become eligible for the national colloquium exam to become licensed dietitians in Lebanon. The mission of the NDCP is to equip graduates with the knowledge, expanded skills, and intellectual maturity to become progressive, innovative, and inter-professional practitioners in the dietetic profession, capable of serving the public through the promotion of optimal nutrition, health, and well-being and to serve the profession and larger community through public service and leadership.

More specifically, the program involves several interrelated dimensions and is:

- dedicated to providing quality education that prepares students for competent practice and current and future roles in the dietetic profession.
- committed to facilitating the intellectual, personal, professional growth, and lifelong learning of students.
- committed to developing critical thinking, problem-solving, and leadership skills to prepare students for the challenges of an evolving diverse community and workplace.
- committed to providing integration of theory with the application of learning through a sequence of supervised practice experiences that encourage students' self-evaluation and self-direction.
- dedicated to preparing students with added proficiency in providing nutrition education to a variety of clients.
- committed to providing an environment for students to conduct research and develop professional attitudes, maturity, and an ethical understanding of professional practice, thereby improving the dietetics practice.
- committed to preparing competent nutrition professionals who perform in adherence to the code of ethics for the profession of dietetics.

Requirements for BS in Nutrition and Dietetics Coordinated Program (NDCP)

Students are first admitted to the three-year nutrition and dietetics program. In addition, a separate application for the NDCP must be submitted during the second term of the sophomore year (upon completion of at least 30 credits). The selection of students for the NDCP is based on the cumulative average of the sophomore year GPA 3.3 or above, unless stated otherwise by the department) and completion of the prerequisite courses. Individuals interested in applying to the NDCP must contact the department for application details towards the end of the sophomore year.

A maximum of 20 students are admitted each year depending on practicum site availability. Students applying to the NFSC department for a second BS in nutrition and dietetics are not eligible for the NDCP.

Graduation Requirements

To be eligible for graduation with the degree of BS in nutrition and dietetics coordinated program (NDCP), students must:

- complete a minimum of 133 credits hours.
- complete a minimum of 1035 hours of supervised practice in an affiliated hospital.
- achieve an overall minimum average grade of B+ (GPA 3.3) in each of the three years of NDCP.
- achieve an overall minimum average grade of B+ (GPA 3.3) in the supervised practice.
- complete the program within four and a half years of enrolment in NDCP.

Failure to meet the above NDCP graduate requirements will result in dismissal from the NDCP program in which case students will graduate with a BS in nutrition and dietetics (NTDT).

Classification and Promotion

For clear promotion from year I to year II, students must complete a minimum of 30 credits. For promotion from year II to year III, students must complete a minimum of 63. For promotion from year III to year IV, students must complete a minimum of 97 credits. All such credits should be from courses specified in the regular program.

Transfer

Applying to the NDCP after Transfer into the NTDT

Transfer from Other Faculties at AUB to NDCP

Transfer students from other faculties within AUB who are accepted into the nutrition and dietetics 3-year program should apply separately to the NDCP and may be considered for acceptance into the program based on the number of available places in the NDCP for the term in question after they:

- have successfully completed at least 30 sophomore credits.
- have achieved a minimum overall cumulative GPA of 3.3.

Admission into the program is by selection of the most promising eligible applicants. Top ranking students of the applying pool of students will be selected based on the number of available places in the NDCP for the term in question.

Transfer from Other Universities to NDCP

Transfer students from other universities who are accepted into the nutrition and dietetics 3-year program should apply separately to the NDCP. These students may be considered for acceptance on the waiting list of the program based on the number of available places in the NDCP for the term in question after they:

- have successfully completed at least 30 credits at AUB.
- and have achieved a minimum overall cumulative GPA of 3.3 in courses taken at AUB.

These students may be considered for acceptance into the NDCP as regular students based on the number of available places for the term in question.

It is important to note that credits/courses completed at another institution will not be granted equivalency credits/courses for the NDCP's core courses. Please refer to the appropriate section of the catalogue for the list of the program's core courses and their descriptions.

Elective Courses

Candidates for the degrees of BS in nutrition and dietetics coordinated program must complete a minimum of 9 credits in Cultures and Histories and 3 credits in Human Values.

Curriculum for the BS Degree in Nutrition and Dietetics Coordinated Program (NDCP)

A minimum of 133 credits are required for graduation.

NDCP I

First term		Credits
BIOL 201	General Biology I	4
CHEM 200	Basic Chemistry and Applications (Understanding the World)	3
CHEM 205	Introductory Chemistry Laboratory	2
ENGL 203	Academic English	3
NFSC 221	Basic Nutrition	3
		Total 15

Second Term		Credits
CHEM 208	Brief Survey of Organic Chemistry (Understanding the World)	3
CHEM 209	Introductory Organic Laboratory	2
ENGL 204	Advanced Academic English	3
PHYL 246	Physiology for Nursing Degree Students and Undergraduates	4
PSYC 201	Introduction to Psychological Science	3
		Total 15

NDCP II (Juniors)

First term		**Credits**
AGSC 212	Microeconomics Theory of Food and Farming (Societies and Individuals)	3
NFSC 240	Nutrition Status Assessment	2
NFSC 261	Introductory Biochemistry	3
NFSC 274	Human Nutrition and Metabolism	3
MNGT 215	Fundamentals of Management and Organizational Behavior (Societies and Individuals)	3
Cultures and Histories (History of Ideas)		3
		Total 17

Winter Term		**Credits**
NFSC 225A	Job Shadowing	0
		Total 0

Second term		**Credits**
ARAB 201 or higher	Understanding Communication – Arabic	3
NFSC 285	Nutrition in the Life Cycle	2
NFSC 265	Food Chemistry	3
NFSC 267	Food Analysis	2
NFSC 286	Nutrition in the Life Cycle Lab for NDCP	1
NFSC 290	Food Service Management	3
NFSC 229	Menu Planning	1
		Total 15

Summer Term		Credits
CMPS 209	Computers and Programming for the Sciences	3
NFSC 225B	Job Shadowing	0
Cultures and Histories Elective		3
		Total 6

NDCP III (Seniors)

First term		Credits
NFSC 210	Statistics in Nutrition and Food Sciences	3
NFSC 222	Community Nutrition (Community-Engaged)	3
NFSC 277	Food Microbiology	3
NFSC 292	Medical Nutrition Therapy I	3
NFSC 279	Medical Nutrition Therapy Lab I for NDCP	1
NFSC 299A	Projects in Nutrition and Food Sciences	0
Human Values Elective		3
		Total 16

Winter Term		Credits
NFSC 298W	Dietetic Practicum	1
		Total 1

Second term		Credits
NFSC 287	Food Processing	2
NFSC 289	Food Processing Lab	1
NFSC 293	Medical Nutrition Therapy II	3
NFSC 297	Medical Nutrition Therapy Lab II for NDCP	1
NFSC 224	Advanced Nutrition Principles and Practices	1
NFSC 296	Current Topics in Food Sciences and Nutrition	1
NFSC 299B	Projects in Nutrition and Food Sciences	2
NFSC 275	Quantity Food Production	2
Cultures and Histories Elective		3
		Total 16

Summer Term (May-June)		Credits
NFSC 298SU	Dietetic Practicum	1
		Total 1

NDCP IV

First term		Credits
NFSC 283	Nutrition Education and Communication	3
NFSC 284A	Seminar in Clinical Dietetics	1
NFSC 298F	Dietetic Practicum	13
		Total 17

Second Term		Credits
NFSC 284B	Seminar in Clinical Dietetics	1
NFSC 298S	Dietetic Practicum	13
		Total 14

Core Courses for the BS Degree in Nutrition and Dietetic Coordinated Program (NDCP)

NFSC 210 Statistics in Nutrition and Food Sciences 2.3; 3 cr.
An introduction to the study of statistics as it applies to nutrition and food sciences. Topics include both descriptive and inferential statistics: samples, population and types of data; organizing and graphing data; numerical descriptive measures; probability; discrete random variables and their probability distributions; continuous random variables and the normal distribution; point and interval estimation and hypothesis testing; correlation and simple linear regression; Chi-Square tests. Students will learn to use the computer package SPSS for statistical analysis. Students cannot receive credit for NFSC 210, STAT 201, STAT 210, STAT 230, ECON 213, or EDUC 227.

NFSC 221 Basic Nutrition 3.0; 3 cr.
The course is a nutritional survey of nutrients, including their food sources, digestion, metabolism, functions and requirements in humans.

NFSC 222 Community Nutrition 3.0; 3 cr.
The course is an introduction to key concepts and current topics in community nutrition. This course discusses the role of nutrition in improving the health and well-being of communities and familiarizes students with population nutritional status assessment, principles of nutrition research and factors involved in planning, implementing and evaluating community nutrition programs and policies. Prerequisites: NFSC 221 and NFSC 285. Fall.

NFSC 224 Advanced Nutrition Principles and Practices 0.3; 1 cr.
The course explores principles essential for being a successful Registered Dietitian (RD), including code of ethics, scope of dietetics practice, medical coding, and process of nutrition legislation within the United States. Through the use of real-life clinical case study scenarios and role playing, students will use the Nutrition Care Process (NCP) in developing their nutrition care plans, and practice counseling techniques to improve their effectiveness in providing nutrition education and working with an interdisciplinary team. Prerequisite: NDCP III. Spring.

NFSC 225 (A, B) Job Shadowing 0 cr.
Students will shadow dietitians at different types of facilities covering MNT, community nutrition and food service management. Prerequisite: NDCP. NFSC 225A is offered in the fall, and NFSC 225B is offered in the summer.

NFSC 229 Menu Planning 0.3; 1 cr.
The course explores the principles and techniques of menu planning for healthy people. Topics include nutrient needs for optimum health, dietary guidelines, food groups, food portion sizes and the use of exchange lists for meal planning and client nutrition education in both the English and Arabic languages. Prerequisites: NFSC 221 and NFSC 240. Spring.

NFSC 240 Nutritional Status Assessment 1.3; 2 cr.
The course exposes students to the theoretical basis of various aspects of nutritional assessment (counseling dietary assessment, anthropometric measurement, biochemical assays and clinical assessment). The course also familiarizes students with nutritional status assessment tools and techniques through practical experimentation in the lab. Prerequisite: NFSC 221. Fall.

NFSC 261 Introductory Biochemistry 3.0; 3 cr.
The course focuses on the study of the chemistry of biological compounds, their enzymatic degradation and intermediary metabolism. Prerequisite: CHEM 208.

NFSC 265 Food Chemistry 3.0; 3 cr.
The course focuses on the study of the chemical composition and physical and sensory properties of foods. Prerequisite: CHEM 208.

NFSC 267 Food Analysis 1.3; 2 cr.
The course exposes students to laboratory methods for chemical analysis of nutrients and chemicals in food products. Prerequisites: CHEM 205 and CHEM 209; pre/corequisite: NFSC 265.

NFSC 274 Human Nutrition and Metabolism 3.0; 3 cr.
The course focuses on human physiological needs for energy, carbohydrates, fats, proteins, vitamins and minerals; control of nutrient metabolism. Prerequisites: NFSC 221, NFSC 261, and PHYL 246.

NFSC 275 Quantity Food Production 1.3; 2 cr.
It is a course whereby principles and methods of buying, preparing and serving foods for various types of quantity food facilities are considered. Standardization of recipes, cost control, safety and sanitation are practiced. Students demonstrate proficiency with food service equipment and utensils, participate in large-scale recipe preparation, and work in teams to create, plan and produce high quality meal(s) for 40-75 people. Prerequisites: NFSC 290 and NDCP III. Spring.

NFSC 277 Food Microbiology I 3.0; 3 cr.
The course is a survey of microorganisms and their role in causing food spoilage and food poisoning, and the control of microbial spoilage and pathogenic microorganisms in foods.

NFSC 279 Medical Nutrition Therapy Lab I for NDCP 0.3; 1 cr.
It is an intensive laboratory course designed to help students learn and practice the application of evidence-based medical nutrition therapy utilizing the nutrition care process for diseases and disorders discussed in NFSC 292. This is done through the use of self-study modules, case studies, reports and discussions. Prerequisites: NFSC 240, NFSC 274 and NFSC 285. Corequisites: NFSC 292 and NDCP III. Fall.

NFSC 285 Nutrition in the Life Cycle 2.0; 2 cr.
The course focuses on the basic nutritional needs of individuals throughout their life cycle: infancy, childhood, adolescence, adulthood and old age, and special nutritional requirements for pregnancy and lactation. Prerequisites: NFSC 221 and NFSC 274. Spring.

NFSC 286 Nutrition in the Life Cycle Lab for NDCP 0.3; 1 cr.
The course emphasizes the practical applications of the principles of nutrition and human development in the context of normal physiologic changes that occur throughout the lifecycle. It incorporates problem-based learning through case studies and employs the nutrition care process for evidence-based implementation of interventions to improve nutrition status and food related behaviors through the life cycle. Prerequisites: NFSC 221, NFSC 229, NFSC 274, NFSC 285, and NDCP III. Spring.

NFSC 287 Food Processing 2.0; 2 cr.
The course focuses on the principle of food spoilage, food preservation and the different methods of food processing. Prerequisites: NFSC 265, and NTDT III or FSMT III.

NFSC 288 Technology of Food Products 2.3; 3 cr.
The course focuses on technology and preservation methods of food products. It also includes laboratory exercises in the pilot plant in food preservation, processing, and quality control testing. Prerequisites: FSMT III, AGRL IV, NTDT III or NDCP III.

NFSC 289 Food Processing Laboratory 0.3; 1 cr.
The course involves students in laboratory exercises in the pilot plant in food preservation, preparation, and processing. Pre/corequisite: NFSC 287. Prerequisites: NTDT III, NDCP III or FSMT III.

NFSC 290 Food Service Management 2.3; 3 cr.
The course focuses on techniques of management of functional operation of food service, field trips, self-study modules, reports, and discussion. Prerequisite: NFSC 221; pre/corequisite: MNGT 215.

NFSC 292 Medical Nutrition Therapy I 3.0; 3 cr.
The course examines selected metabolic diseases, HIV and cancer by covering their etiology, metabolic pathways and the importance of medical nutrition therapy. Prerequisites: NFSC 240, NFSC 274, and NFSC 285. Fall.

NFSC 293 Medical Nutrition Therapy II 3.0; 3 cr.
The course is a thorough review of the nutrition care process in the treatment of diet-related diseases. The course prepares students to implement the nutrition care process for various conditions, including but not limited to overweight and obesity, diabetes, cardiovascular, gastrointestinal and renal diseases. It helps students: 1) understand the pathophysiology of selected diseases in which nutritional intervention plays a major role, 2) identify the nutritional needs of patients with disease and 3) develop an appropriate patient nutrition care plan. Prerequisites: NFSC 274, NFSC 240, and NSFC 285. Spring.

NFSC 296 Current Topics in Food Sciences and Nutrition 1 cr.
The course is a seminar presentation in current topics in food sciences and nutrition. Prerequisite: NTDT or NDCP III.

NFSC 297 Medical Nutrition Therapy Lab II for NDCP 0.3; 1 cr.
It is an intensive laboratory course designed to help students learn and practice the application of evidence-based medical nutrition therapy utilizing the nutrition care process for diseases and disorders discussed in NFSC 293. This is done through the use of self-study modules, case studies, reports and discussions. Prerequisites: NFSC 240, NFSC 274, and NFSC 285. Corequisites: NFSC 293 and NDCP III. Spring.

NFSC 299A Projects in Nutrition and Food Sciences 0 cr.
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that is designed to introduce the students to the skills necessary to execute research projects in their academic discipline. Prerequisite: NTDT or FSMT III. Fall.

NFSC 299B Projects in Nutrition and Food Sciences 2 cr.
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that complements NFSC 299A. It is designed to help guide the students execute a project in their academic discipline. Prerequisites: NFSC 210, NFSC 299A, CITI.

NFSC 283 Nutrition Education and Communication 3 cr.
The course focuses on principles of health behavior, learning theories and their application to nutrition education and nutrition counseling practice. Equips students with the necessary communication tools and techniques to help prevent nutrition-related disease and promote health. Prerequisite: NDCP IV. Fall.

NFSC 284 (A, B) Seminar in Clinical Dietetics 1 cr.
This course focuses on developing the communication and research skills as well as on strengthening the critical thinking capacities of CP students undergoing an intensive internship program by providing them the opportunity to present and discuss all interesting nutritional issues arising during their CP practicum. It is divided into NFSC 284A and 284B. Prerequisite: NDCP IV.

NFSC 298 (W, SU, F, S) Dietetic Practicum 28 cr.
The course involves training for a minimum of 1035 hours at an affiliated medical facility. Prerequisite: NDCP IV.

Elective Courses neither for Nutrition and Dietetics nor for Food Science and Management

NFSC 123 Nutrition and Physical Activity 3.0; 3 cr.
Inadequate physical activity and a poor diet are considered to be leading causes of many major diseases. Exercise has potent effects on the metabolism of both macro and micronutrients. Exercise and nutrition together offer a powerful intervention for many health problems, including sarcopenia, metabolic disease, and obesity. This course is designed to give students an understanding of the fundamental interactions between exercise, nutrition, and health, mainly with lifestyle changes based on current international dietary and physical activity guidelines. Students who receive credit for NFSC 123 cannot receive credit for NFSC 223. Elective.

NFSC 215 Gender, Food, and Nutrition 3.0; 3 cr.
Goal 5 of the United Nations' Sustainable Development Goals (SDGs) aims to "achieve gender equality and empower all women and girls" around the world. While women and girls often have increased nutritional needs during the lifecycle, social norms in many parts of the world frequently lead to gender inequalities in nutrition, which tend to disfavor females. This course discusses nutrition from a gender equality lens and sheds light on their mutually reinforcing relation: improving nutrition is crucial to achieving gender equality and, in turn, improving gender equality contributes to better nutrition. The course will discuss the changing nutritional needs throughout the lifespan, the social and cultural norms affecting food choice, and the prevalent gender disparities in food and nutrition security. The course will also highlight the need to focus on improving nutrition of girls and women as a public health strategy aimed at curbing the growing burden of chronic diseases in modern societies.

NFSC 220 Food and Nutrition Awareness 3.0; 3 cr.
The course introduces the discipline of nutrition and assists students in making optimal food choices for better health. Elective.

NFSC 223 Nutrition and Physical Activity 3.0; 3 cr.
Inadequate physical activity and a poor diet are considered to be leading causes of many major diseases. Exercise has potent effects on the metabolism of both macro and micronutrients. Exercise and nutrition together offer a powerful intervention for many health problems, including sarcopenia, metabolic disease, and obesity. This course is designed to give students an understanding of the fundamental interactions between exercise, nutrition, and health, mainly with lifestyle changes based on current international dietary and physical activity guidelines. Students who receive credit for NFSC 223 cannot receive credit for NFSC 123. Elective.

NFSC 252 Introduction to Food Processing 3.0; 3 cr.
Technology and processing of foods; includes the different technologies applied to preserve and process food from post-harvest stages to being ready for consumption. Processing methods covered relate to cereals, dairy products, meat, poultry, fats and oils, fermentation, fruits, and vegetables, as well as beverages. Elective.

Faculty of Agricultural and Food Sciences (FAFS)

Undergraduate