Division of University Interdisciplinary Programs (DUIP)

Following a reappraisal of its current practice, the Division of University Interdisciplinary Programs (DUIP) has been frozen in order to develop more efficient ways the unit can serve as a coordinating body for interdisciplinary education across AUB. The MA program in public policy and international affairs is now housed in FAS, while the MS degree program in energy studies is now housed in MSFEA.

Master Degree Program in Environmental Sciences

Director	Massoud, May
Professors	Jaafar, Hadi (FAFS); Zurayk, Rami (LDEM); Massoud, May (FHS)
Associate Professors	Doummar, Jouanna (Earth Sciences); Yehya, Alissar (CEE); Salam, Darine (CEE); Makdisi, Karim (PSPA)

Background

The Interfaculty Graduate Environmental Sciences Program (IGESP) is a multidisciplinary field of study which leads to the master of science degree in environmental sciences with four possible majors: environmental technology, ecosystem management, environmental health, and environmental policy planning.

Together, these majors ensure adequate coverage of all environmental and sustainable development issues prevailing in Lebanon and the Arab World, in their various ecological, economic, political, and social dimensions.

The program has been designed to cater to the rising demand for environmental scientists in the Middle East region. The specificity of the region's environment is reflected both in the program's academic and educational perspectives.

Founded in the mid-1990s, the IGESP program- recognizing Lebanon's unique environmental, societal, and cultural diversity also understands that various environmental problems affect the integrity of the country's ecosystems. Accordingly, IGESP adopts a holistic approach to resolving those problems and offers a course of study designed to address both the most salient environmental issues as well as more specialized topics.

IGESP draws on the resources of various faculties/departments and provides opportunities for study and research in the field of the environment in its totality. While the program caters mostly to physical and natural sciences students, it is offered to students holding a bachelor's degree in any approved relevant discipline of engineering, natural or social science, or humanities. It provides graduates with the necessary tools to assess diversified and multidisciplinary environmental issues. The program focuses on enhancing students' research, analytical, problem-solving, and critical-thinking skills by emphasizing the case study approach to learning and solving environmental problems.

Like all programs at the American University of Beirut, IGESP is registered in the US through the New York State Education Department.

Mission

The mission of the AUB IGESP program is to contribute to building the environmental capacity in Lebanon and the region through human resources development as well as research and community involvement. The essence of the program lies in its interdisciplinarity. The program is firmly based on a holistic view of the environment that integrates the ecological, technical, health, and socioeconomic dimensions. We aim to train creative, flexible, and cross-curricular graduates capable of appreciating, building on, and applying cutting-edge knowledge for the management of the environment. Our graduates are empowered with exceptional technical, managerial, critical evaluation, research, and reporting skills.

Vision

The IGESP program aspires to be the leading interdisciplinary program bridging environmental education, research, and service through close partnership with academic institutions and civil society actors.

General Information

The degree of master of science (MS) in environmental sciences is offered with four possible majors:

- Ecosystem management in the Faculty of Agricultural and Food Sciences (FAFS)
- Environmental health in the Faculty of Health Sciences (FHS)
- Environmental technology in the Maroun Semaan Faculty of Engineering and Architecture (MSFEA)
- Environmental policy planning in the Faculty of Arts and Sciences (FAS)

The program draws on the resources of various departments of the faculties of Agricultural and Food Sciences (FAFS), Arts and Sciences (FAS), Engineering and Architecture (MSFEA), Health Sciences (FHS) and Medicine (FM), and it provides opportunities for study and research in the general field of environment.

The program provides graduates with the necessary tools for professional practice and/or the pursuit of higher education. It is administered by an interfaculty committee that coordinates with the graduate committees of the faculties concerned.

Criteria for Admission

To be accepted into the program, applicants must:

- meet general university requirements for admission to graduate study.
- be recommended by the appropriate faculty graduate committee and accepted by the Interfaculty Coordinating Committee of the program.
- provide at least two academic letters of recommendation and one other professional letter if relevant.
- submit a detailed effective statement of purpose (400-500 words) for each major indicating the purpose for pursing graduate study in the particular field at AUB and specifying the applicant's research interests and/or practical experience in the field. Note: The statement should be oriented to the major.
- have a background that is relevant to the major.

Applicants to the program may be admitted under the following categories:

- Graduate – if the GPA in the last 60 credits or the last two years is greater than 3.3.
- Graduate on probation – if the GPA in the last 60 credits or the last two years is less than 3.3 and greater than 3.0.

Adequate preparation to take any graduate course is decided by the academic adviser and the Interfaculty Graduate Environmental Sciences Program Committee (IGESPC).

Degree Requirements

Requirements for the degree of master of science in environmental sciences (any major), both thesis and non-thesis options, are tabulated below. The master's degree with thesis option will normally require four regular terms to be completed. In both options, students are required to complete 30 credits of which 9 credits are core courses.

Course	Group	Thesis Option Credits	Non-Thesis Option Credits
Core	A	9	9
Electives	B	15	18
Thesis		6	
Project			3
Total number of credits required for graduation			**30**

Core courses, as well as basic and broad electives, are listed below. Other relevant electives not listed below may be accepted on a case-by-case basis. These courses are structured to provide students with a diversified and multidisciplinary background in environmental sciences. Students have to register for the core course offered by their faculty of concentration. Students are also required to select two other supplementary courses from the list of core courses approved by the program. Students may not select two core courses from the same faculty. Students can take other elective courses from other faculties after securing the approval of the adviser. Specific faculty/department requirements are defined under each respective faculty/department.

Group A	Core Courses in Environmental Science	Credits
One course selected from the following ECOM core courses		
ENSC 630/LDEM 630	Natural Resources Management	3
LDEM 301	Urban Greening	3
LDEM 302	Green Infrastructure for Resilient Landscapes and Cities	3
One course selected from the following ENVH core courses		
ENSC 640/ENHL 310	Toxicology and Environmental Health Hazards	3
ENSC 641/ENVH 312	Occupational Health	3
ENSC 642/ENHL 314	Environmental Management Systems	3
One course selected from the following ENVT core courses		
CIVE 550	Water Treatment and Laboratory	3
CIVE 551	Wastewater Treatment and Laboratory	3
CIVE 552	Waste Management and Treatment	3
CIVE 553	Environmental Biotechnology	3
CIVE 555	Air Quality Management	3
CIVE 654	Environmental Bioremediation	3
ENSC 600/CIVE 655	Air Pollution and Control	3
ENVP core course		
ENSC 650/PSPA 316	International Environmental Policy	3

Group B	Examples of Major Electives	Credits
1. Ecosystem Management		
ENSC 631/LDEM 631	Agricultural Pollution and Control	3
LDEM 632/URPL 641	Geographic Information System	3
ENSC 633/LDEM 633	Ecological Landscape Design and Planning	3
ENSC 634/LDEM 634	Sustainable Landscape Planning and Management	3
ENSC 635/LDEM 635/ PSPA 3446A	Political Ecology of Water	3
ENSC 622/CIVE 653	Environmental Chemistry and Microbiology	3
ENSC 641/ENHL 312	Occupational Health	3
ENSC 642/ENHL 314	Environmental Management Systems	3
ENSC 652/CIVE 656	Environmental Impact Assessment	3
ENSC 654	Physical and Biological Resources in Terrestrial Ecosystems	3
ENSC 655/AGSC 301	Statistical Methods in Agriculture	3
ECON 333	Energy Economics and Policy	3
ENSC 662/ECON 338	Economics of Natural Resources and the Environment	3
LDEM 300	Directed Study in Ecosystem Management	3
LDEM 301	Urban Greening	3
LDEM 302	Green Infrastructure for Resilient Landscapes and Cities	3
BIOL 362	Advanced Ecology	3
BIOL 363	Population and Community Ecology	3
AGSC 376	Resource and Environmental Economics	3
AGSC 384	Political Economy of Middle East Development	3
CIVE 648	Climate Change and Water Resources	3
CIVE 552	Waste Management and Treatment	3

ENSC 630/LDEM 630/ CIVE 633	Natural Resources Management	3
CIVE 654	Environmental Bioremediation	3
ENSC 600/CIVE 655	Air Pollution and Control	3
CIVE 659	Environmental and Water Conflict Management	3
URPL 664	Urban Land Use Planning	3
URPL 665	Development and Planning Policies	3

2. Environmental Health		
CIVE 601	GIS and Geospatial Data Modeling	3
EPHD 300	Principles of Epidemiology	3
PBHL 300	Foundations of Public Health	3
PBHL 310	Research Design	3
EPHD 310	Basic Biostatistics	3
ENSC 600/CIVE 655	Air Pollution and Control	3
ENSC 640/ENHL 310	Toxicology and Environmental Health Hazards	3
ENSC 641/ENHL 312	Occupational Health	3
ENSC 642/ENHL 314	Environmental Management Systems	3
ENHL 301	Environmental Health and Sustainable Development	1
ENHL 307	Food Safety	3
ENHL 308	Tutorial	1-3
ENHL 320	Special Topics in Environmental Risk Analysis	3
ENSC 652/CIVE 656	Environmental Impact Assessment	3
ENSC 658/PSPA 343	Environmental Conflict Resolution	3
ENSC 661/BIOL 363	Population and Community Ecology	3
ENSC 662/ECON 338	Economics of Natural Resources and the Environment	3

CIVE 659	Environmental and Water Conflict Management	3

3. Environmental Technology		
CIVE 550	Water Treatment and Laboratory	3
CIVE 551	Wastewater Treatment and Laboratory	3
CIVE 552	Waste Management and Treatment	3
CIVE 553	Environmental Biotechnology	3
CIVE 555	Air Quality Management	3
CIVE 601	GIS and Geospatial Data Modeling	3
CIVE 602	Experimental Design and Statistical Methods	3
CIVE 650	Water and Sewage Works Design	3
CIVE 651	Processes in Water and Wastewater Treatment	3
CIVE 652	Landfill Engineering Design	3
CIVE 653	Environmental Chemistry and Microbiology	3
CIVE 654	Environmental Bioremediation	3
ENSC 600/CIVE 655	Air Pollution and Control	3
CIVE 656	Environmental Impact Assessment	3
ENSC 651/CIVE 657	Methods of Environmental Sampling and Analysis	3
CIVE 658	Industrial Waste Management	3
CIVE 659	Environment and Water Conflict Management	3
CIVE 685	Environmentally Sustainable Renewable	3
CIVE 751	Wastewater Reclamation and Reuse	3
ENSC 602/CIVE 755	Air Pollution Modeling	3

4. Environmental Policy Planning		
PPIA 301	Public Policy and Practice	3
PPIA 304	Development	3
PPIA 305	Economics for Public Affairs	3
PPIA 306	Political Economy	3
PPIA 307	Politics of Policy-Making	3
PPIA 308	Research Methods	3
PPIA 309	Topics in Public Policy	3
PPIA 310	Topics in Public Policy	3
PPIA 311	Topics in International Affairs	3
PSPA 312	Public International Law	3
PSPA 314	The UN and International Politics	3
PSPA 324	Government and Politics of Lebanon	3
PSPA 343/ENSC 658	Environmental Conflict Resolution	3
PSPA 345	Special Topics in Environmental Policy and Politics	3
PSPA 346	Special Topics in Natural Resource Policy and Politics	3
PSPA 351	New Public Management	3
PSPA 352	Foundations of Public Policy	3
PSPA 360	Public Policy Research and Analysis	3
ENSC 659/PSPA 362	Public Policy and Administration	3
PSPA 373	The Ethics of Public Administration	3
AGSC 376	Resource and Environmental Economics	3
AGSC 384	Rural Social Change, Development the Environment	3
ECON 333	Energy Economics and Policy	3
ECON 338	Economics of Natural Resources and the Environment	3

URPL 664	Urban Land Use Planning	3
URPL 665	Development and Planning Policies	2
CIVE 601	GIS and Geospatial Data Modeling	3

Students can take other elective courses from other faculties after securing the approval of their adviser.

Graduation Requirements

See General University Academic Information section in this catalogue.

Core Course Descriptions

CIVE 550 Water Treatment and Laboratory 3 cr.
A course that examines the quality and principles of municipal wastewater treatment processes and methods of testing for physical, chemical, and biological parameters. (Core course)

CIVE 551 Wastewater Treatment and Laboratory 3 cr.
A course that examines the quality and principles of municipal and industrial water treatment processes and methods of testing for physical, chemical, and biological parameters. (Core course)

CIVE 552 Waste Management and Treatment 3 cr.
A course on engineering principles, practices, and techniques for the management of solid wastes: sources, composition, properties, impacts, generation, storage, collection and transport, processing, resource recovery, and disposal. (Core course)

CIVE 553 Environmental Biotechnology 3 cr.
A course that examines current and emerging environmental biotechnologies used for environmental quality evaluation, monitoring, and remediation of contaminated environments, and provides students with working knowledge of the science that underpins them. (Core course)

CIVE 555 Air Quality Management 3 cr.
A course on the principles, practices, and techniques for the management of air pollution: types, sources, properties, impacts, standards, control technologies, atmospheric dispersion, emissions, and indoor air quality. (Core course)

CIVE 654 Environmental Bioremediation 3 cr.
A course that discusses the application of biological treatment for the remediation of contaminated environments, and highlights current engineering methods/design used to enhance biodegradation. (Core course)

CIVE 655/ENSC 600 Air Pollution and Control 3 cr.
A course that examines processes and design equipment for the control of particulates and gaseous emissions. (Core course)

CIVE 685 Environmentally Sustainable Renewable Energy Sources 3 cr.
A course that covers basic principles, potentials, and limitations of various renewable energy sources and technologies- including solar energy, hydroelectricity, wind energy, bioenergy, fuel cells, batteries, and supercapacitors. Sustainability and impact of renewable energy sources on the environment will be discussed. Prerequisite: CIVE 251 or CHEM 202.

LDEM 301 Urban Greening 3 cr.
This course allows students to develop an understanding of nature in cities, present the latest research and concepts on urban nature, describe, and conceptually apply urban greening approaches, explore urban residents' relation with nature, and discuss opportunities and limitations of urban greening in restrictive environments. Graduate or senior undergraduate standing. (Core course)

LDEM 302 Green Infrastructure for Resilient Landscapes and Cities 3 cr.
Green infrastructure is an ecologically based system, naturally occurring or engineered, across urban and rural contexts, that is multi-functional and delivers essential cultural, social, environmental, ecological, and economic benefits. It requires a holistic and systems approach to improving ecological function while providing vital ecosystem services for human populations. The course introduces students to the concepts, theories, and applications of design, planning, and policy of green infrastructure in conjunction with open space planning and design. A particular focus is the relationship and synergy between green infrastructure and climate change adaptation of landscapes and cities. A case study approach is utilized to study green infrastructure across multiple scales, disciplines, and applications in the Middle East and North Africa (MENA) region. Green infrastructure is inherently multi-disciplinary and intersects with landscape architecture, urban design and planning, architecture, environmental engineering, public health, urban policy, and environmental policy. Graduate or senior undergraduate standing. (Core course)

LDEM 630/ENSC 630 Natural Resources Management 3 cr.
This course introduces students to key concepts in ecosystem-based natural resources management (NRM) and to the management of specific terrestrial resources: soils, water, land, and biodiversity with examples drawn from drylands and developing nations. A landscape lens is adopted to examine territory-scale resource management options such as farming, ecotourism, forestry, and rangelands. The course also addresses the physical, socioeconomic, cultural, political, and geographic specificity of NRM by reviewing the status of Arab Natural Resources in a changing environment. (Core course)

ENSC 640/ENHL 310 Toxicology and Environmental Health Hazards 3 cr.
The course presents toxicology in three sections. In the first section, the fundamental principles and essentials of toxicology are introduced, particularly dose-response, toxicokinetics, and cellular mechanisms of action. In the second section, the course discusses toxicity of main organ systems. Classic toxicants that adversely affect health, emerging hazardous human exposures, and special topics, are discussed in the last section of the course. The course includes lecture style presentations, collective case- studies activities, and student led discussions. Topics of local and regional relevance are also introduced through hosting guest speakers. (Core course)

ENSC 641/ENHL 312 Occupational Health 3 cr.
This course overviews the general principles of occupational health, relating work, the work environment, and workers' health and wellbeing to general principles of social equity and justice. The course surveys research on the social, economic, political, environmental, and health elements of a workplace using multidisciplinary approaches. Students who join the course are able to identify occupational hazards and work- related injuries and illnesses in workplaces and propose monitoring, management, and prevention strategies to lessen their impact on workers. With its emphasis on social justice, the course discusses the factors that make some workers' groups more vulnerable than others. Its unique approach emphasizes global perspectives and popular imaginations of workers through academic publications, newspaper journalism, cinema, lectures, and class discussions. This course is designed for students of multiple educational and training backgrounds and does not require prerequisite knowledge. (Core course)

ENSC 642/ENHL 314 Environmental Management Systems 3 cr.
The implementation of an Environmental Management System (EMS) integrates the precautionary and polluter pays principles into firms' operations and demonstrates commitment to sustainable development. This course provides an overview of the most common international standards for environmental management systems, primarily the International Standards Organization (ISO) harmonized management systems and its implications for different organizations. It provides students with the skills to formulate and evaluate such management systems. Although the first part of the course is mainly lecture based, student participation in the form of questions and discussion is always welcomed and encouraged. Critical thinking will be promoted throughout the course. Students will be expected to formulate an EMS for an organization and prepare a technical report to communicate project findings to their colleagues through verbal presentation. Emphasis is placed on solving environmental problems using an integrated management approach in order to achieve an optimized environmental performance. Alternate years. (Core course)

ENSC 650/PSPA 316 International Environmental Policy 3 cr.
A course that seeks to provide a broad overview of the key concepts, actors, and issues related to global environmental policy. This course outlines the evolution of environmental policy in facing global environmental challenges and how such policies have become inherently intertwined with government policy, business practice, and international trade. Annually. (Core course)

ENSC 695 Comprehensive Exam 0 cr.
Comprehensive Exam.

ENSC 697 Project 3 cr.
The project must be undertaken, in partial fulfillment of the requirements for the degree, upon the completion of at least 27 credits of core and elective courses. Students who are unable to finish the project in one term can register one additional time.

ENSC 699 Thesis 6 cr.
Thesis.

Interfaculty Graduate Neuroscience Program (IGNP)

The Interfaculty Graduate Neuroscience Program leading to the MS degree in neuroscience draws on the resources of the Faculty of Medicine, the Faculty of Engineering and Architecture, and the Faculty of Arts and Sciences, and is administered by graduate committee of the faculty of Medicine.
Neuroscience is the study of the nervous system. It includes an interrelated set of scientific disciplines including basic (neuroanatomy, neurophysiology, neurochemistry, neuropharmacology, neurobehavior) and clinical (neurology, neurosurgery, anesthesiology, neuropathology, ophthalmology, psychiatry) subjects.
Since its inception in 1974, the program has been run by faculty in the Department of Anatomy, Cell Biology and Physiological Sciences (DACP; former Physiology and Human Morphology Departments). Although the participating faculty comes primarily from the DACP, contributions are made from faculty members in the Neurosurgery Division and the Neurology and Psychiatry Departments and from other departments in the Faculty of Medicine, the Biology and Psychology Departments in the Faculty of Arts and Sciences, and the Electrical Engineering Department in the Maroun Semaan Faculty of Engineering and Architecture.
The Interfaculty Graduate Neuroscience Program (IGNP) is a member of the Association of Neuroscience Departments and Programs (ANDP) in Bethesda, Maryland (USA), whose aim is to advance education and research in neuroscience.

Admission Requirements

The program is flexible in accepting students from a variety of backgrounds, including MD graduates and holders of the BS degree from various university programs. Applications must be submitted through the AUB website; selected applicants must fulfill the admission criteria for graduate studies at AUB.

Graduation Requirements for the MS in Neuroscience

- Students holding a BS or BA degree are required to take a minimum of 21 graduate credit hours and present a thesis (9 credits) based on independent research in one of the basic neuroscience subjects.
- Holders of the MD degree, or medical students who have completed the first two years towards the MD, are required to take a minimum of 10 non-medical graduate credit hours in addition to a thesis (9 credits).
- Only one course (IDTH 308 - Basic Neuroscience (6 credits) is required, in addition to a wide choice of electives from various departments and faculties.

Average Length of Time

- Four terms for holders of BS or BA degrees.
- Two terms for MD graduates or medical students who have completed the first two years of the medical program.

Course Descriptions

IDTH 308 Basic Neuroscience 62.54; 6 cr.
This course covers the structure and function of the human nervous system. This course can also be taken in two parts: IDTH 308A and IDTH 308B. Annually.

IDTH 308A Neuroanatomy 31.27; 3 cr.
This course is offered to graduate students. The course covers normal structure of the human nervous system. See HUMR 308 in the Department of Anatomy, Cell Biology and Physiological Sciences.

IDTH 308B Neurophysiology 31.27; 3 cr.
This course is offered to graduate students. The course covers function of the human nervous system. See PHYL 308 in the Department of Anatomy, Cell Biology and Physiological Sciences.

IDTH 395 A/B Comprehensive Exam 0 cr.
Prerequisite: Consent of adviser.

IDTH 399 A/B/C/D/E MS Thesis 9 cr.
MS Thesis

HUMR 305 Cell and Tissue Biology 30.33; 3 cr.
Consists of the first half of Basic Histology, HUMR 209, covering cells and tissues. Open to all graduate students.

HUMR 310 Biomedical Research Techniques 28.46; 3 cr.
A guided laboratory course in research methods used in cell biology and physiology. Open to graduate students. The course is made of three modules that can all be selected or selected as one module per specialty as follows:

HUMR 310A Cell Biology Techniques 10.15; 1 cr.
Cell Biology Techniques

HUMR 310B Genomics and Proteomics 10.15; 1 cr.
Genomics and Proteomics

HUMR 310C Mouse Models and In Vivo Studies 8.16; 1 cr.
Mouse Models and In Vivo Studies

IDTH 309 Biology of Nerve and Muscle 48.0; 3 cr.
A multidisciplinary study of anatomy, physiology, biochemistry, pharmacology, and pathology of nerve and muscle. Alternate years.

PHYL 310 General Physiology: Cellular Mechanisms 32.16; 3 cr.
A course on aspects of membrane transport processes across symmetrical and asymmetrical cell membranes, electrophysiology, membrane potentials, action potentials in excitable cells, synaptic transmissions and excitation-contraction coupling in muscles. Open to all graduate students.

PHYL 324 Electrophysiology of Excitable Cells 12.9; 1 cr.
A study of the basic mechanisms of membrane cable property and resting potentials in all cells, action potential initiation and propagation in excitable cells, receptor physiology, central synaptic transmission, neuromuscular transmission, and muscular contraction. Annually.

In addition, any elective graduate course from other graduate programs may be taken.

Interfaculty Graduate Public Health Nutrition Program (PHNU)

The master of science in public health nutrition is a new graduate program offered jointly by the Faculty of Agricultural and Food Sciences (FAFS) and the Faculty of Health Sciences (FHS) at AUB. Students may pursue the master of science in public health nutrition in either a thesis or a non-thesis track. The successful completion of the degree will require 40 credit hours for both tracks. Credits must be earned within the Faculty of Agricultural and Food Sciences and the Faculty of Health Sciences.

For the non-thesis track, 39 credits out of the required 40 credits should be earned as core program courses, including a culminating experience and a practicum. One credit must be earned by completing an elective course within either of the two faculties. For the thesis track, students must complete a total of 34 credits as core courses and must work on a 6-credit thesis under the supervision of a thesis adviser and thesis committee and defend their thesis as per AUB graduate program policies.

Credit requirements for both the thesis and non-thesis options for the master of science in public health nutrition are tabulated below:

		Non-Thesis Track Credits	Thesis Track Credits
Year 1			
NFSC 301	Statistical Methods for Nutrition and Food Sciences	3	3
NFSC 306A	Community Nutrition	2	2
EPHD 300*	Principles of Epidemiology	2	2
PHNU 300	Fundamentals of Public Health Nutrition	3	3
PBHL 303	Design and Evaluation of Public Health Programs	3	3
PBHL 304	Public Health Policy and Advocacy	3	3
PHNU 304	Nutrition in Emergencies	2	2
HPCH 331	Theories in Health Promotion	2	2
HPCH 334	Qualitative Research in Health Promotion	3	3
Total year credits		**23**	**23**

Year 2			
HPCH 333	Social Marketing in Health Promotion	2	2
FSEC 310	Food and Nutrition Security	3	3
PHNU 301	Nutrition in the Life Cycle	3	3
PHNU 302	Nutrition-related Chronic Disease	3	3
PHNU 390	Practicum	2	0
PHNU 391	Integrative Learning Experience	3	0
	Elective	1	-
PHNU 396	Comprehensive Exam	0	0
PHNU 399	Thesis	0	6
Total year credits		**17**	**17**
Total credits		**40**	**40**

*Or NFSC 307 Nutritional Epidemiology 3.0, 3 cr.

Core Courses

NFSC 301 Statistical Methods for Nutrition and Food Science 2.3; 3 cr.
This is an intermediate-level course in statistics. Topics include an introduction to designs in Nutrition and Food Science research; critical appraisal of literature; methods of describing data; statistical inference for means and proportions; linear and logistic regression, and an introduction to multiple regression. Prerequisites: STAT 210 or EDUC 227 and CMPS 209 or equivalent undergraduate course in statistics. Offered Fall.

NFSC 306A Community Nutrition 2.0; 2 cr.
In this course, students will be trained on the role of nutrition in improving the health and wellbeing of communities and will be equipped with skills required to conduct community-based assessment, as well as plan, implement, and evaluate community nutrition programs and policies. The course combines theory and practice where students will discuss, analyze, and experiment with the theories of behavioral change and will apply the principles of nutrition education when tackling specific nutritional problems. Students will be provided with experiential learning opportunities to assess the health and nutrition needs of specific population groups. In addition, this course will give students the opportunity to plan, implement, and evaluate small-scale nutrition interventions to improve the health and wellbeing of individuals within select communities. Offered Spring.

EPHD 300 Principles of Epidemiology 1.5:1.5; 2 cr.
This course introduces graduate students to the basic principles and methods of epidemiology and the application of the epidemiological approach to public health research, policy, and practice. The course consists of weekly lectures and practical application sessions. Students will learn about the rubrics of Epidemiology, dynamics of disease transmission, common sources of epidemiological data, measures of morbidity and mortality, observational study designs, measures of association, biases and confounding, and general principles of causation in epidemiology. The main concepts will be covered during the lecture. The application sessions (e.g., problem-solving exercises, case-studies, journal critiques, mapping…) will allow students to apply their acquired epidemiological knowledge and understand the role of epidemiological evidence in current practices of public health policy and practice.

NFSC 307 Nutritional Epidemiology 3.0; 3 cr.
This course deals with the design, conduct, analysis, and interpretation of epidemiologic studies related to nutrition, particularly the relationship between nutritional status, diet, and disease. Prerequisites: STAT 210 or EDUC 227 and CMPS 209 or equivalent undergraduate course in statistics. Offered Fall.

PHNU 300 Fundamentals of Public Health Nutrition 3 cr.
This course introduces students to the field of public health nutrition, covering the fundamental pillars of the field; nutrition status and needs assessments and planning, monitoring, and evaluating nutrition interventions. Students will be exposed to the theories and conceptual frameworks behind addressing nutrition-related health issues at a population level. Offered Fall.

HPCH 331 Theories in Health Promotion 2.0; 2 cr.
This course focuses on theories utilized to understand health determinants and outcomes and to promote individual and population health. Students will critically examine perspectives from health promotion and other social science disciplines through theoretical readings and empirical case studies. They will also discuss the merits and challenges of using theory to analyze health and to intervene at multiple levels from the individual to the structural levels. Prerequisites- PBHL 312 or (PHNU 300 and NFSC 307). Offered Spring.

HPCH 334 Qualitative Research in Health Promotion 3.0; 3 cr.
The course develops learners' qualitative research skills to address a research question relevant to health promotion. Students engage through classroom discussions; role play and assignments to gain hands-on experience in conducting qualitative research beyond class settings. Students learn about qualitative research designs and methods and then apply the research process by generating data and analyzing the data to answer a research question of their choice. They will also learn how to evaluate the quality or rigor of a qualitative research proposal or manuscript. Topics include in-depth interviews, observations, focus groups, thematic analysis, research rigor and research ethics. Prerequisites: PBHL 310 and PBHL 312 or (PHNU 300 & NFSC 307 & NFSC 301).

PHNU 301 Nutrition in the Life Cycle 3.0; 3 cr.
This course covers the nutritional needs of individuals in different stages of the life cycle, with a focus on maternal and child nutrition and nutrition in the elderly. Offered Fall.

PHNU 302 Nutrition-related Chronic Disease 3.0; 3 cr.
This course covers epidemiology, etiology, and the medical and nutritional management of chronic diseases whose etiologies are nutrition related. Offered Fall.

HPCH 333 Social Marketing in Health Promotion 2.0; 2 cr.
In this course, students will learn the theoretical underpinnings of social marketing, a framework used to develop strategies aimed to address social and public health issues and to design effective, sustainable, and ethically sound public health campaigns. As a service-learning course, students apply concepts acquired into the development of a social marketing plan for a local community partner organization, responding to selected public health issues. This course is offered in a blended learning format and is based on a combination of different modes of delivery (online and face-to-face) and diverse models of teaching and learning styles, providing students with an interactive and meaningful learning environment. Prerequisites: HPCH 331 and PBHL 303. Offered Fall.

FSEC 310 Nutrition Security: Assessment and Intervention Strategies 3.0; 3 cr.
This course introduces students to basic principles of nutrition security, community nutrition, and nutritional ecology, and highlights the role that nutrition plays in improving the health and wellbeing of communities. The course aims to equip students with the knowledge and skills required to conduct population-based nutrition research, assess the nutrition needs of a population, plan, implement and evaluate community nutrition programs and policies based on evidence-based practice and while taking into consideration cultural, social, and contextual dimensions. Offered Fall.

PHNU 304 Nutrition in Emergencies 2.0; 2 cr.
This course covers evidence-based community nutrition interventions in emergency situations that place vulnerable populations at risk of food insecurity and consequent malnutrition. Offered Summer.

PBHL 303 Design and Evaluation of Public Health Programs 2.2; 3 cr.
This course introduces students to the concepts and methods of public health program design and evaluation. Students will develop skills for assessing population needs for the development of health programs. The course then covers public health program design, including developing measurable objectives, identifying evidence-based intervention strategies, and planning for program implementation. Students will learn to select appropriate methods for impact and process evaluation of health programs. Prerequisites: PBHL 310 (waived for PHNU students) and PBHL 312 or (PHNU 300 & NFSC 307 & NFSC 301 & HPCH 334 (concurrently)). Offered Spring.

PBHL 304 Public Health Policy and Advocacy 3.0; 3 cr.
This course introduces students to the relevant concepts and approaches in public health policy and advocacy. It will provide students with a basic understanding of the public health policymaking process as well as the basic elements of advocacy. The aim is to make MPH students informed of the complex nature of public health policy development, be critical consumers of health policy research and evidence, and be analytical of the influence of various actors on the policy process. Students will learn the stages of the policy process (i.e., agenda setting, policy development, policy implementation and policy evaluation). The field draws upon numerous disciplines. As such, course readings will be drawn from political science, sociology, biomedical sciences, and policy studies. Students will also cover the basic elements of an advocacy process, including defining the issue, understanding the audiences, and crafting advocacy strategies. Case studies, class discussions, and guest speakers will provide tangible examples of public health policy and advocacy processes at the national, regional, and international levels. Ethics and equity considerations will be included in discussions related to concepts and application. Offered Spring.

PHNU 396 Comprehensive Exam 0 cr.
Comprehensive Exam.

For thesis track: PHNU 399 MS Thesis 6 cr.
PHNU 399 MS Thesis.

For non-thesis track: PHNU 390 Practicum 2.0; 2 cr.
The practicum is considered an essential part of the curriculum of students. Students gain practical experience working with organizations engaged in developing, implementing and /or evaluating community-based public health nutrition programs. This experience may be purely research-based for students aiming for more academic careers. Offered Spring.

PHNU 391 Integrative Learning Experience 3.0; 3 cr.
This course will allow students to apply knowledge and skills acquired throughout their graduate courses. Through this course, students will develop an understanding of how to conduct a community-based project or a research project beginning with the conception of ideas and concluding with depicting written results and discussing them, along with proper citations and procedures. Part I offered in Fall and Part II offered in spring.

List of Elective Courses

HPCH 301 Health Communication 2.0; 2 cr.
Health communication is an area of study that examines how human and mediated communication can influence the outcomes of healthcare and health promotion efforts. This core MPH course introduces the students to the basic concepts of health communication and its scholarship, including the focal areas of health literacy and patient-provider communication, social marketing, health campaigns, risk communication, crisis communication, and health advocacy. In the course, students will discuss the ways communicating about health is influenced by individual, social, and societal factors. The course will provide students with tools to critically evaluate existing health campaigns and to outline strategies to effectively communicate with different audiences about health-related topics. They will also design culturally appropriate, evidence-based health messages, designed for specific publics. Through this course, students will also learn how to effectively communicate scientific information with different audiences (e.g., general population, experts, the media), appropriately choosing oral and written materials and communication channels.

NFSC 395 Graduate Seminar in Nutrition and Food Science 1.0; 1 cr.
Offered in fall and spring.

AUB Nature Conservation Center (NCC)

Director	Abunnasr, Yaser, PhD Planning, MLA, BArch
Staff	Kallab, Antoine (Associate Director); Hourani, Anna (Operations Manager); Barakat, Jill; Mouawad, Leila Rossa; Badran, Sara; Ghanem, Salma; Ghassibe, Carine; Boustany, Tatiana; Bassil, Nour; Bou Rjeily, Justine; Khodor, Rawya; Kaskas, Aya; Joubrane, Ghada.

Executive Committee Members

Associate Professor, Landscape Design and Ecosystem Management (MSFEA)	Abunnasr, Yaser, PhD
Dean, Faculty of Business- (AUB Mediterraneo) Associate Professor, Suliman S Olayan School of Business (OSB)	Daou, Alain, PhD
Senior Lecturer, Architect and Urban Planning, Urban Planning Policy and Design (MSFEA)	Yazigi, Serge PhD
Professor, Biochemistry and Molecular Genetics (FM)	Darwiche, Nadine, PhD
Associate Professor of Clinical Specialty, Family Medicine (FM)	Romani, Maya, MD
Assistant Professor, Sociology, Anthropology and Media Studies (FAS)	Perdigon, Sylvain Jean Daniel, PhD
Professor, Landscape Design and Ecosystem Management Department (MSFEA)	Talhouk, Salma, PhD

Introduction

The AUB-NCC is a multidisciplinary academic institution focused on environmental research and advocacy, dedicated to promoting sustainable development and conservation. Through innovative research, education, and community-based initiatives, AUB-NCC addresses pressing environmental issues, including climate change. Collaborating with partners at local, regional, and global levels, the center develops effective solutions to advance environmental impact and action to support a sustainable future.
As Lebanon and the wider MENA area encounter more difficult environmental issues, AUB-NCC is stepping up its work to develop new strategies to tackle these issues and strengthen community resilience.
Furthermore, the center's initiatives are designed to tackle key environmental challenges through a series of forward-thinking programs, listed below:

- **Water and Life:** Investigates critical issues surrounding water resources, including availability, quality, and governance, while exploring solutions for water-related challenges. The program addresses the nexus between water, energy, food, and ecosystems, promoting sustainable water management practices that benefit both human and environmental health.
- **Earth, Society, and Wellbeing:** Explores the interdependencies between environmental health and human wellbeing, advancing research on natural remedies, traditional medicine, and the role of ecosystems in supporting mental and physical health. The program aims to generate insights that contribute to sustainable healthcare solutions grounded in biodiversity.
- **Eco-transition and Circularity:** Focuses on pioneering sustainable waste management practices, promoting the circular economy, and advancing green transitions in industries and communities. This program addresses critical issues of resource scarcity and environmental degradation by fostering innovative solutions for recycling, reducing waste, and improving resource efficiency.

- **Citizenship and Nature:** Promotes environmental stewardship through place-based education, conservation initiatives, and community-led actions, fostering a deep connection between individuals and their natural surroundings. The program emphasizes local engagement and behavioral change to build resilient ecosystems and informed citizens.
- **Regenerative Planning:** Develops strategies for creating resilient and regenerative systems that support environmental, social, and economic sustainability. By integrating whole-system approaches, the program promotes long-term health and vitality of ecosystems, cities, and communities through landscape restoration, urban planning, and resilient infrastructure development.

Since its establishment in 2002, AUB-NCC has mobilized people and institutions throughout Lebanon to support nature conservation, improved the environment, and inspired countless individuals to appreciate and embrace sustainability. The center leverages the expertise and experience of AUB's faculties from different fields and involved around 92 faculty members to tackle the region's most pressing environmental challenges.

Throughout its tenure, AUB-NCC has recruited interns, worked with local and international businesses, engaged, and impacted Lebanese citizens, engaged students, enrolled volunteers, operated with municipalities, worked alongside NGOs, collaborated with universities, and cooperated with government authorities. All the actors at stake illustrate the center's multi-disciplinarity, as they aid the center in achieving its mission.

Center for Advanced Mathematical Sciences (CAMS)

Since its founding in 1999, the Center for Advanced Mathematical Sciences (CAMS) has become a key player in the nucleation, stimulation, and celebration of research in the mathematical sciences in Lebanon and the MENA region. Part playground, part laboratory and part crossroads, the Center is keen on engaging multiple stakeholders in the development and dissemination of mathematics, the making and telling of its history. In addition to the research activities which it funds and organizes, the Center aims to nurture the rich and productive dialogue between mathematics, the humanities and the arts through innovative interventions that amplify the impact of mathematics across fields, and communities. Naturally, and through opportunities for collaborative, interdisciplinary research and teaching, CAMS advances AUB's mission by attracting and retaining exceptional scholars as members of its intellectual community.

Director: Jihad Touma

International Advisory Committee

The CAMS International Advisory Committee (IAC) is envisaged to be a dynamic, relevant, and representative advisory body, taking into account gender, diversity of research fields, longstanding association with CAMS, mathematics in Lebanon, connections to Sir Michael Atiyah and his legacy, connections to leading researchers at AUB in mathematics, and related fields. The committee oversees the activities of CAMS, assists in charting future directions, and evaluates, on an annual basis, the center's success in meeting its objectives with recommendations. Members of the committee may also provide help in securing continued external funding for CAMS in accordance with the University's fundraising policy. Its members are appointed by the President of the University, with the Provost of AUB as an ex-officio member who acts as its vice-chair and secretary.

In addition to AUB's Provost, and CAMS Director, members of the International Advisory Committee include:

Claire Voisin	Collège de France
Cumrun Vafa	Harvard University
Frances Kirwan	Oxford University
Madhu Sudan	Harvard University
Mikhael Balabane	University of Paris
Nassif Ghoussoub	University of British Columbia
Peter Glynn	Stanford University
Peter Goddard	Institute of Advanced Study
Scott Tremaine	Institute of Advanced Study/University of Toronto (IAC Chair)

CAMS Objectives

In fulfillment of its mission, CAMS engages with a spectrum of actors within the mathematical community and its broader public, via organically structured thematic explorations. In so doing, CAMS aims to:

- act as a catalyst of mathematical research that reflects longstanding interests within AUB and collaborating Lebanese Universities [e.g., number theory/algebraic geometry, complex and differential geometry, PDEs, optimal transport, stochastic modeling, theoretical computer science, complexity and network science, control theory, information theory, and increasingly statistical learning and artificial intelligence].
- stimulate the formation of research units, through targeted fellowships, and seed funding, leading to clustering around fields sustained by programmatic grants.
- act as a focal point for promoting collaborative research among scientists in the region, partly by hosting visitors, and partly by organizing thematic programs, topical meetings, workshops, and conferences in pertinent fields.
- respond to national/regional priorities by collaborating with national research centers/units around vital data and its mathematical/computational modeling (e.g. stochastic modeling of epidemics, complexity and network science at the service of resilience, modeling of hydrogeological/geophysical measurements, data driven models of ocean/atmosphere circulation).
- structure and support activities that stimulate awareness about mathematics across all levels, leading up to undergraduate and graduate research [e.g., Mathematics Olympiad, summer research programs, PhD-to-PhD conferences, CIMPA Schools, broad public talks, teacher training workshops, etc.].

The Issam Fares Institute for Public Policy and International Affairs (IFI)

Director	Bahout, Joseph
Assistant Director	Mourad, Yara
Staff	Abbas, Dania (Finance and Grants Manager); Chamma, Marina (Communications Manager); Solh, Leila (Research Development Manager); Hodroj, Lamis (Administrative Assistant)

Inaugurated in 2006, the Issam Fares Institute for Public Policy and International Affairs (IFI) was established as an independent, research-based and policy-oriented institute with the aim of initiating, developing, and communicating policy-relevant research from and about Lebanon and the Arab world, contributing to the realms of both academia and policymaking.
Forming a bridge between academia and policymaking, the central mission of IFI is threefold:

- To conduct and disseminate high-quality research on the complex issues, problems, and challenges faced by Lebanon and the Arab world within the world's rapidly shifting global contexts.
- To generate research and evidence-based policy recommendations to address local and regional challenges.
- To create a space for interdisciplinary dialogue, engagement, and exchange of ideas among various stakeholders.

Since its establishment, the institute has made an indelible contribution to research and debates on public policy and international affairs in Lebanon, the region, and internationally. The institute takes pride in its vast knowledge of and hands-on experience with the political landscape and numerous policy networks in the Middle East and beyond. Treading the sensitive interface between research and "real" politics, IFI navigates the often-arduous process of dialogue between experts and policymakers, integrating the constraints of real-time policy-making and the intricacies of governmental, inter-agency work. More importantly, the Institute has made large and successful contributions to the shaping of research agendas, and has introduced local and international stakeholders to novel and innovative ways of thinking and understanding the world's problems. It has effectively brought together the worlds of ideas, politics, and policy, translating academic research and knowledge and making it both accessible and understandable. The impactful work produced by IFI has enabled various institutions (e.g. governmental, non-governmental, and international), the public, and society to better understand politics and policymaking processes; make data-driven informed decisions on a myriad of socio-economic and political issues; and understand the alternative (or "other") viewpoints on these issues and serve as a platform for debate and engagement. IFI recognizes its potential to act as a strong think tank given its geographical location and presence in one of the most prominent academic institutions in the region. It has access to a vast pool of scholars, professionals, departments, centers, and research generating groups therefore allowing the Institute to swiftly navigate, coordinate, and lead on novel projects and dialogues that impact and inform public policy. IFI continuously seeks to spearhead and partake in projects and initiatives that are multidisciplinary, interdisciplinary, and transdisciplinary in focus.

Its three interconnected clusters of focus are the following:

1. Sustainability and Inclusive Development

Climate Change: environment preservation, climate conflict, water, and food security
Energy and Technology: power in Lebanon, oil, and gas, renewable resources, and energy transition
Refugees: socio-economic impacts, political dimensions, protracted displacement, laws, and policies
Education and Youth: labor inclusion, educational reform, policymaking, youth
Political Economy: debt recovery, economic inequality, trade, labor markets
Urban and Rural Planning: housing, public transport, social justice
Public Health: health systems, mental health, pandemics

2. Policy, Politics, and Governance

Nation-state Structure: constitutional debates, state/society relations, state structure and organization, decentralization, federalism, Ta'if and beyond
State Reform and Public Administration: decentralization, federalization, clientelism, corruption, e-government, judiciary and justice reform, fiscal and budgetary governance
The Political Landscape: political forces and parties (Lebanon/regional), political cultures (local/national)
Electoral Processes and Debates: laws and systems, voter behavior, electoral databases, polling surveys
Security and Politics: civil/military relations, National Defense strategy, security apparatuses reform and democratic oversight

3. Lebanon in the World: Regional and International Affairs

The Global System: global power equilibriums, rising and contending new powers (BRICS, the "EAST," Global South), humanitarian protection, gender, ethics
Lebanon in the International Order: in the UN/UNSC, Arab League, foreign policy
Lebanon Abroad, the Lebanese Diaspora Project: Lebanese in the world, cooperation with American institutions
Lebanon and its Neighbors: EuroMed, Med and East-Med, Arab Neighborhood (special attention to the Gulf, Turkey, Iran, and involvement in the Levant
Syria Watch: regime transformations, political economy/reconstruction, regional power plays/influences

The above topics within each of the clusters are not exhaustive, and priorities for policy dialogue and policy-based interventions are set according to the current and most pressing local, regional, and international developments. IFI ensures that research and dialogue generated cuts across two or more clusters and makes essential links between each of the subtopics to offer a comprehensive and rich understanding of the subject being addressed. It also allows to draw in various experts/stakeholders to the table so as to enhance meaningful debates and develop solid, well-grounded policies in line with the current realities and context.

Internship Program

The institute offers internships for local and international students seeking first-hand experience in the fields of public policy, international affairs, and communications. Each year dozens of students have an opportunity to intern with IFI's various tracks and gain research and administrative skills that pave the way for a successful career in their fields of interest.

Affiliate Program

Out of our commitment to expanding and deepening knowledge production and to creating a space for the interdisciplinary exchange of ideas among researchers, civil society actors, and policymakers, our institute has established an affiliation program divided into two different categories: 'Associate and University Fellows' and 'Affiliated Scholars.'

Associate fellows constitute the intellectual network of academics, researchers, professionals, and practitioners, that gravitate around the institute, contributing to its work, knowledge production and activities. Associate fellows are either resident or non-resident, while maintaining full professional affiliation to their respective institutions. They are invited to be part of our network of experts, based on thematic interest and needs, in line with the institute's vision and development strategy, and with the final approval by the director. Fellows are associated to the institute on a voluntary basis, the specific conditions of which are decided between the fellow and the institute.

Meanwhile, University Fellows are those belonging to various the departments, faculties and units of our university. University fellows not only contribute in expanding and enriching the institute's knowledge production and intellectual life, but highlight the organic link between our institute and the American University of Beirut.

Affiliated scholars are post-doctoral scholars or PhD candidates who are finalizing their dissertation and whose current research project is relevant to one of the institute's research programs. The affiliation gives the scholar an institutional home at the university and the ability to access the AUB libraries, as well as other campus resources. Most importantly, this affiliation offers the scholar the opportunity to collaborate with researchers and staff from the institute and share their ongoing research for feedback and support. The duration of this affiliation may vary from a short stay up to one full academic year.

Munib and Angela Masri Institute of Energy and Natural Resources

Director	Ghaddar, Nesreen R., Professor and Qatar Chair in Energy Studies, Department of Mechanical Engineering
Executive Assistant	Assaad, Sandrine
Institute Steering Committee	
Abdel Rahman, Abdel Fattah	Professor, Department of Geology
Al Ghoul, Mazen	Professor, Department of Chemistry
Ghaddar, Nesreen	Professor and Qatar Chair in Energy Studies, Department of Mechanical Engineering
Jabr, Rabih	Professor, Department of Electrical and Computer Engineering
Moukalled, Fadl	Professor, Department of Mechanical Engineering
Zeaiter, Joseph	Associate Professor, Baha and Walid Bassatne Department of Chemical Engineering and Advanced Energy

Introduction

The Munib and Angela Masri Institute of Energy and Natural Resources at the American University of Beirut (AUB) was established in June 2007 through a generous endowment pledge of $5 million by AUB Trustee Munib Masri of the Munib & Angela Masri Foundation.

Mission

The Munib and Angela Masri Institute of Energy and Natural Resources provides a vehicle for promoting research and advanced study in the petroleum, water, and energy disciplines, as well as a focal point for collaborative research among scientists, engineers, and professionals in Lebanon and in the region at large. The institute serves as an interfaculty coordinating unit in AUB and a catalyst for advanced research in the sciences and engineering for the management and conservation of natural resources and energy.

Objectives

The objectives of The Munib and Angela Masri Institute of Energy and Natural Resources are the following:

- Initiate, guide, and support collaborative and interdisciplinary research in renewable energy and energy efficiency, water and mineral resources, and management of natural resources to protect the environment.
- Support research studies that advance knowledge in areas that promote sustainable development in the region.
- Form research clusters and multi-disciplinary research teams crossing boundaries of disciplines to address complex problems.
- Organize specialized training workshops, academic and public seminars, conferences, lecture series, and similar high scholarly events.

Activities of the Institute

The activities of The Munib and Angela Masri Institute of Energy and Natural Resources are the following:

- Initiate and enhance collaborative and interdisciplinary research that leads to sustainable impact.
- Form research clusters and MOUs with a focus on critical contextual issues.
- Organize academic and public seminars, lecture series and international workshops.
- Enhance collaborative research and dissemination of research results at AUB.
- Support projects and blended learning, increasing graduate (master) students.
- Support outreach contextualized digital hybrid learning.
- Support activities of the interdisciplinary master program in energy studies at MSFEA.

Division of University Interdisciplinary Programs (DUIP)