

Department of Environmental Health

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The Department of Environmental Health offers a three-year undergraduate program in environmental health, which is accredited by the United States Council on Education for Public Health (CEPH). Students are admitted to the department after the completion of the freshman science program or its equivalent and are awarded a Bachelor of Science degree upon graduation. The curriculum provides a broad education in basic sciences and fundamental knowledge of environmental health. Emphasis is placed on the evaluation and control of major environmental health problems in developing and developed countries in such fields as indoor and outdoor air pollution, water, sanitation and hygiene, food safety, risk analysis, municipal and hazardous waste, occupational health and safety, environmental impact assessment and audits, climate change and sustainable development. During their senior year, students in the program are also given the opportunity to complete an internship in pre-approved work settings, thus providing them with the opportunity to supplement their theoretical and laboratory experience with real life practical field experience. Moreover, as part of the program, students are also required to take public health courses in epidemiology and biostatistics, health management and health promotion, which facilitates acquiring a minor in Public Health (refer to Minor Policy page 590). Additionally, students can follow a pre-medical track, if interested in joining the medical school.

Due to increased environmental concerns, Lebanon and countries in the region are in great need of qualified personnel capable of planning and implementing policies, strategies and programs to enhance human health and ecological vitality. This provides great job opportunities in various sectors, such as public/governmental agencies, international organizations, private companies, non-governmental organizations and academic/research institutions.

Course Descriptions

ENHL 200 Environment and Health

3.0; 3 cr.

A course that exposes the students to major local and global environmental issues relating to air, water, land and energy and the importance of proper integrated management to promote and protect public health and achieve sustainable development. In addition, the course highlights the importance of environmental laws and policies as major tools in the management of environmental health issues. Environmental ethics is also emphasized as a critical core factor of the management processes. The importance of environmental awareness of different stakeholders is exposed as a means to achieve proposed objectives. *Open to freshman students only.*

ENHL 220 Fundamentals of Environmental Health Sciences 3.0; 3 cr.
 A course that explores the interdisciplinary nature of environmental health sciences. It explains fundamental scientific concepts relating to the various environmental components and focuses on the relationship between the environment and human health. Using case studies and critical thinking exercises, the course covers a variety of topics including air, water and soil pollution, energy, waste management, climate change, biodiversity and sustainable development. It also highlights the relationship between population growth, economics, politics, ethics and the environment.

ENHL 221 Management of Domestic and Hazardous Wastes 3.0; 3 cr.
 A course that introduces the elements of solid waste management: sources, characterization, generation rates, collection, transportation, and disposal technologies. Concepts are presented within the context of integrated management: reduction, reclamation, recycling, and disposal. Socioeconomic implications at the community and national levels are emphasized. *Pre or co-requisite: ENHL 220. Students can't receive credit for both ENHL 221 and CIVE532/ENSC610.*

ENHL 227 Environmental Microbiology 2.2; 3 cr.
 A course that introduces students to the microbial world and relates microbiology to environmental issues and community health. It explores the fundamentals of bacteriology, virology, and parasitology and covers infectious diseases transmitted through air, water, food, soil, municipal solid wastes, and wastewater. It covers topics such as microbial environments, detection of microorganisms and their activities in the environment, industrial microbiology, and bioremediation. *Pre or co-requisites: BIOL 200/201 and ENHL 220.*

ENHL 231 Water and Wastewater Quality Control 3.0; 3 cr.
 A course that focuses on the principles of water management (both in quantity and quality) with emphasis on fresh water resources for domestic and multi-purpose utilization. Characterization, treatment, reclamation, and recycling of wastewater are also discussed. National and international guidelines, standards, and directives for water and wastewater management are presented. *Prerequisites: ENHL 220 and ENHL 227.*

ENHL 232 Instrumentation, Analytical Techniques and Sampling 3.1; 3 cr.
 A course that focuses on the basic concepts and application of different sampling methods, and instrumental and analytical techniques: electrical conductance, absorption spectrophotometer (visible, ultraviolet light, infrared, atomic absorption), emission (flame photometry) and chromatography (gas chromatography, high performance liquid chromatography, ion chromatography). *Prerequisite: ENHL 220.*

ENHL 233 Quality Determination of Water and Wastewater 2.2; 3 cr.
 A course that focuses on the quality determination (physical, chemical, biochemical, and microbiological) of water and wastewater samples using standard analytical techniques. Students are required to write professional quality assessment reports. Proper presentation and interpretation of results and practical recommendations for preventive or corrective measures are emphasized. *Prerequisites: ENHL 220, ENHL 231 and ENHL 232.*

ENHL 234 Occupational Health 2.2; 3 cr.
 A course that provides an overview of the general principles of occupational health using a multidisciplinary framework. Applying diverse perspectives, students of the class will learn about hazards in the workplace and the health, economic, political,

social, and societal ramifications of occupational health and safety. The course offers a dynamic learning environment that emphasizes critical thinking and engagement. Students will learn by applying research and readings to case studies, media analysis, and in-class discussions. *Prerequisite: ENHL 220.*

ENHL 235 Toxicology and Risk Analysis 3.0; 3 cr.

A course that introduces students to the principles of toxicology (exposure to toxicants and its absorption, distribution, metabolism, and excretion), selected toxic chemicals, and the impact of toxicants on selected human organs and systems. It also introduces students to the application of toxicology in public health, namely dose-response and causal relationships, risk assessment, management, and communication including the process of setting environmental standards. *Prerequisites: ENHL 220, BIOL 200/201, CHEM 208 and CHEM 209.*

ENHL 236 Practicum 3 cr.

This is a required course of Environmental Health students providing them with an opportunity to supplement their theoretical and laboratory experience with a real life practical field experience. Students are assigned to environmental projects and challenges in pre-approved work settings in the public sector, private sector (industries, consulting firms), academic and research centers, UN agencies, or international and national NGOs. Students will address current environmental issues supervised by environmental practitioners. Wherever feasible, practicum sites will be assigned to meet the student's long term academic and career objectives. The experience will sharpen the student's writing, technical and analytical skills in a supervised setting and develop the skills to conceive of and successfully complete a well-defined project within a limited time frame. *Prerequisites: Completion of all the ENHL courses of the first two and a half years. ENHL 242.*

ENHL 238 Indoor and Outdoor Air Pollution 3.0; 3 cr.

A course that discusses exposure and health effects of indoor (e.g., asbestos, tobacco smoke, formaldehyde, radon) and outdoor air pollutants. Students are introduced to modeling, quality determination, and management strategies. This course includes a "service learning" component through which students will engage with a predetermined organization to identify and address a public health problem. This opportunity will allow students to "share" and "receive" knowledge and expertise leading to enhanced learning among students and benefit to the chosen organization. *Prerequisites: ENHL 220, CHEM 208, or CHEM 211 and CHEM 212 (could be taken concurrently).*

ENHL 239 Food Safety 3.0; 3 cr.

A course that focuses on food safety from production to consumption (preparation, processing and preservation, storage, marketing and trading). Emphasis is placed on the development, implementation and appraisal of food safety management systems and certification schemes (such as GHP, GMP, HACCP, ISO 22000 and FSSC) at the national and international levels. *Prerequisites: ENHL 220, ENHL 227 and CHEM 208. The course is equivalent to NFSC 282.*

ENHL 242 Environmental Management Tools and Applications 3.0; 3 cr.

A course that provides an overview of the general principles relating to environmental management tools and applications. Topics covered include environmental impact assessment, environmental auditing, and environmental regulations and standards. To provide students with practical experience, they are requested to conduct a community-

based environmental health project. Emphasis is placed on investigating the problem and proposing management strategies. *Senior standing required. Prerequisites: ENHL 221, 233, 234, 235, 238, (ENHL 239 or NFSC 282).*

ENHL 243 Global Environmental Issues 3.0; 3 cr.

Global environmental problems such as climate change, water shortage, floods, fires, depletion of stratospheric ozone, and the loss of biodiversity have captured news headlines and the attention of the public. These developments are transnational, in that their impact is felt across national boundaries and effective responses require coordinated efforts transcending any individual state. The establishment of conventions and institutions facilitating international cooperation reflect this reality, yet the success of these efforts has been frequently inadequate and criticized as favouring the powerful over the disenfranchised. This course engages students in a review of global environmental issues affecting the Arab region and beyond. This review will explore research on the history and causes of these environmental problems, giving special attention to their framing in public discourse. The ecological, social, economic, political, cultural, and health aspects of the environmental problems are discussed in a debate format. The local, national, and international efforts to develop strategies to address these problems are also raised. *Prerequisite: ENHL 242*

ENHL 245 Environmental Economics 3.0; 3 cr.

A course that introduces the principles of economics and its use as a tool to analyze and value the environment by providing a quantitative measure that can guide policy. The course focuses on the cost of environmental pollution and degradation in contrast to the economic value of conservation, environmental amenities (such as clean water, air, and soil) and environmental mitigation and remediation. *Prerequisite: ENHL 220.*

Modes of Analysis	Understanding Communication - English and Arabic (9)	Cultures and Histories (9), Human Values (3)	Societies and Individuals (6)	Understanding the World (12) Quantitative Reasoning (6)	Major Courses (42)	Community-Engaged Learning (3)
Lecture Course (9+12+6+12+6+42+3)	<ul style="list-style-type: none"> Required Arabic Course (3) Required English Courses: ENGL 203 (3), 204 (3) 	<ul style="list-style-type: none"> Cultures and Histories (9) electives (9) Phil 209 (3) 	<ul style="list-style-type: none"> HPCH 237(3) Elective (3) 	<ul style="list-style-type: none"> ENHL 220 (3) BIOL 200(4) CHEM 208(3) EPHD 203(3) EPHD 213(2) EPHD 203A(1) 	<ul style="list-style-type: none"> ENHL 220 (3), 227(3), 221(3), 239(3), 231(3), 232(3), 233(3), 234A(3), 235(3), 238(3), ENHL 242(3), 243(3), 245(3) ENHL 232(3), 234A(3), 233(3), 227(3) ENHL 242(3), 243(3) ENHL 242(3), 243(3) ENHL 236(3) 	<ul style="list-style-type: none"> HMPD 204 (3)
Lab (4+4)				<ul style="list-style-type: none"> BIOL 200(4) CHEM 209(2) 		
Seminar (2)					<ul style="list-style-type: none"> ENHL 242(3), 243(3) 	
Research Project (1+3)					<ul style="list-style-type: none"> ENHL 242(3), 243(3) 	
Fieldwork					<ul style="list-style-type: none"> ENHL 236(3) 	

Students take, in addition to the required courses above, 9 free elective credits in various fields and modes of analysis.