Department of Landscape Design and Ecosystem Management (LDEM)

Chairperson:	Abunnasr, Yaser
Professors:	Talhouk, Salma; Zurayk, Rami (ECOM Program Coordinator)
Associate Professor:	Abunnasr, Yaser
Assistant Professors:	Al-Akl, Nayla; Dreksler, Beata; Trovato, Maria Gabriella
Associate:	Makhzoumi, Jala

Graduate Program

The graduate study program leading to the MSES (Master of Science in Environmental Sciences) degree with a specialization in Ecosystem Management (ECOM) is offered with a thesis or non-thesis option.

The program educates students in ecosystem science and management by integrating instruction in biophysical and human systems. It provides students with sufficient research experience and equips them with the necessary tools for professional practice and/or the pursuit of higher education. Students are prepared to be leaders and agents of change to address issues of local and global relevance at the nexus of human development, ecological integrity and the sustainable use of resources.

Core and elective courses are structured to provide students with a diversified and multi-disciplinary background in environmental sciences including environmental restoration and nature conservation, ecosystem sciences and management, urban greening and natural resources planning and management. The program crosses traditional boundaries by applying an interdisciplinary approach and multiple resource knowledge to ecosystem studies while also emphasizing human-nature interactions.

Effective fall 2020/21, new ECOM students will need to take a total of 5 core courses equivalent to 15 credits (3 core courses from LDEM in addition to two core courses from ENVT, ENVH or ENVP). The 3 core graduate courses offered at LDEM include LDEM 301 (Urban Greening), LDEM 302 Green Infrastructure for Resilient Landscapes and Cities, and LDEM 630 (Natural Resources Management). ECOM students will also need to take 3 elective courses equivalent to 9 credits (to be determined after consultation with their advisor). ECOM students will also register for a Comprehensive Exam (ENSC 695; 0 cr.) and an MS Thesis (ENSC 699; 6 cr.).

Natural resources management involves not only the understanding of ecosystem structure and function when used for a variety of purposes, but also the incorporation of social, economic and political considerations into decision-making. Consequently, the discipline involves the collection, analysis, interpretation and integration of information not only from the more traditional areas of science but also from the areas of management.

For full details on the admission requirements for this interfaculty program, see the Admissions section of this catalogue and the Admission Policies for the Interfaculty Graduate Environmental Sciences Program.

For information regarding graduation requirements, refer to the General University Requirements in this catalogue.

Credit requirements are tabulated below:

Course Type	Credits	
Core	15	(out of which 9 are from LDEM)
Electives	9	
Project/Thesis	3/6	
Total number of credits required for graduation 30		

MSES (Major: Ecosystem Management)

Core Courses

LDEM 301 /   **Urban Greening**   **3 cr.**
URDS 674 /
ARCH074

This course focuses on the literal green aspect of urban greening that is plants and how they contribute to improve urban living. Topics covered in the course include urban agriculture, green roofs, walls, facades and corridors, parks and open spaces, urban forestry and horticulture therapy. Graduate or senior undergraduate standing (Core Course).

LDEM 302 /   **Green Infrastructure for Resilient Landscapes and Cities**   **3 cr.**
URDS 675 /
ARCH 075

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 /   **Natural Resources Management**   **3 cr.**
ENSC 630

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, socio-economic, cultural, political and geographic specificity of NRM by reviewing the status of Arab Natural Resources in a changing environment (Core course).

ENSC 695   **Comprehensive Exam**   **0 cr.**

ENSC 697   **Project**   **3 cr.**
Students who opt for Project option instead of Thesis need to take one additional elective course.

ENSC 699   **MS Thesis**   **6 cr.**

Elective Courses

LDEM 631/   **Agricultural Pollution and Control**   **3 cr.**
ENSC 631
This course introduces students to the fate of agrochemicals in the environment and their effect on terrestrial and aquatic systems. Contamination, monitoring residues, methodologies and risk assessment models are studied and researched.

ENSC 633/   **Ecological Landscape Design and Planning**   **3 cr.**
LDEM 633/
URDS 664
An introduction to the theory and methodology of ecological landscape design and planning, which aims to introduce the holistic approach of landscape ecology and its application in the sustainable management of natural and cultural landscapes and ecosystems. The course syllabus is planned to prioritize Mediterranean ecosystems and landscapes and equally to promote interdisciplinary collaboration in research and project management.

LDEM 634 /   **Sustainable Landscape Planning and Management**   **3 cr.**
ENSC 634
An introduction to the theory and methodology of sustainable landscape planning, which aims at introducing a holistic approach of sustainable planning on the national level of management, including the legal framework, relevant sector policies and prevailing practices.

LDEM 635/   **Political Ecology of Water**   **3 cr.**
ENSC 635/
PSPA 346A
This course provides an approach to understand water issues, bringing together political economy and hydro-geography. The course's objective is to introduce students to the modes of use and management of water resources, analyzing the causes of water injustice, revealing power relations and environmental hidden costs. The course is planned to emphasize the situation of water politics in the Arab region.

LDEM 654 /   **Physical and Biological Resources in Terrestrial Ecosystems**   **3 cr.**
ENSC 654
This course introduces students to the physical and biological resources in ecosystems, soils in the ecosystem, soil conservation, water in the ecosystem, water conservation, principles of soil and water chemistry and microbiology, plant and animal biodiversity, collection and conservation of wild plants, preservation of endangered species and plant response to environmental stress.

LDEM 300　　　　**Graduate Tutorial**　　　　　　　　　　　**1-3 cr.**
Directed Study in Ecosystem Management.

LDEM 303　　　　**Research Methods in Landscape Architecture**　　　**3 cr.**
　　　　　　　　　　and Socio-spatial Studies
The purpose of this course is to train students with scholarly methods of inquiry by using appropriate research design process for their thesis topic. This course is structured based on applied methodologies in research topics related to natural and built environments, landscape ecology, and socio-spatial studies. It is especially focusing on the expansion of approaches to research methodology, including pertinent strategies (Qualitative, Quantitative, and Mixed Methods), research hypothesis/questions, data collection instruments, data analysis tools, and findings refining techniques. Throughout the course, students will be introduced to canonical readings reviewing research design process and research methods in relevant fields. By the end of this course, students will complete the prospectus and the full proposal of their thesis.