Department of Landscape Design and Ecosystem Management (LDEM)

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Undergraduate Program

The mission of the department is to promote a holistic view of landscape and the environment within its students and to equip them with cutting-edge, scientific knowledge and creative, flexible skills for the design and management of natural and cultural resources. The essence of the department lies in its interdisciplinary nature, equally in teaching and in research with applications in the large Middle Eastern region. To that end, the department builds on the strong linkages established with other academic units within and outside the faculty.

The following design courses are part of the program requirements. There is a grade average requirement for: LDEM 202, LDEM 216, LDEM 222, LDEM 204, LDEM 228, LDEM 246, LDEM 241 and LDEM 242. A student should maintain a combined average of 70 in two consecutive design studios within a given year. Failure to achieve this will result in the student having to repeat the design studio in which s/he received the lowest grade.

Course Descriptions

Core Courses for the Bachelor of Landscape Architecture (BLA)

LDEM 200  Landscape Technical Drawing 4 cr.
This is a course in descriptive geometry and graphic communication in landscape architecture. Students learn to use drawing tools. They acquire techniques of representation of 3D and space on 2D surfaces, including orthogonal (plans, sections, and elevations), paraline (axonometrics and isometrics), and perspective drawings. Applications cover construction of shades and shadows, representation of open space, trees, and elements of the natural and built landscapes. Students are introduced to the basics of manual and digital drawing techniques.

# Part time
LDEM 201  Landscape Descriptive Drawing  4 cr.
The focus of the studio is to emphasize visual thinking techniques and graphical information representation. Through the use of multiple media to sketch and draw the landscape, students learn to understand their environment through developing skills in mapping information, understanding their relationships and graphically representing it.

LDEM 202  Studio I: Landscape Design Fundamentals  4 cr.
This course is the first of two fundamental design courses (the second is LDEM 216). It is a foundation for subsequent design courses. It introduces students to theories of design through readings, analysis and hands-on projects. The course is structured as series of short exercises and is divided into two parts:

Part 1: Fundamental Elements of Landscape Design
An exploration into the modes of space: two-dimensional surfaces, three-dimensional objects, spatial enclosure, and the open continuous landscape. The emphasis is on the media of landform, water, plants, and structures as defining agents of human space in the garden and the landscape at large. The form and character of the space is further determined by the context of the site and, the nature of spatial geometry with studies of form, pattern, texture, tone, and color.

Part 2: Basics of Design
This studio introduces students to reading and responding to the site. Goals include learning to experience and record the landscape, to design in response to the site, to think creatively, to generate design ideas and understand design as a process, to gain knowledge of design precedents and principles, and to learn tools and techniques of visual expression. Students will learn through in-class exercises, reading assignments, and design projects. Studio time is divided between lectures, field trips, studio design work, desk critiques, pin-ups and presentations.

LDEM 204  Studio IV: Cultural Landscape Design  6 cr.

Part 1: Cultural Landscapes
The cultural landscape studio introduces students to the process of research, planning, design, and management of historically and culturally significant landscapes through selected real world site projects. Part one introduces methods of assessment, approaches and policies (local and international), case studies of similar projects as well as historical analysis of the study area.

Part 2: Historic Preservation and Design
Landscape design proposals for sites within historically significant areas. Emphasis is on methods of analysis and design development. Graphic and photographic documentation of existing built forms serve as the basis for design proposals. Students engage in the following five steps in the process of their study: 1. Investigating a landscape's site history using primary and secondary resources; 2. Analyzing, documenting, and evaluating existing conditions; 3. Interpreting the significance of the natural, historic and cultural importance of the landscape site; 4. Recommending appropriate treatment strategies; and 5. Presenting the findings of this research process. Prerequisite: LDEM 222.
LDEM 216  Studio II: Landscape Garden Design 4 cr.
This course is the second of two design introductory courses. It is a foundation for subsequent courses that explore project design in varied contexts and scales. It introduces students to theory and practice of landscape design and site planning by doing, observing, reading and reflecting. Students apply knowledge acquired from LDEM 202 on real site contexts with an emphasis on site design. Focus is on two dominant landscape design types: the park (public) and the garden (private). Students will analyze case studies and relevant readings pertaining to both landscape typologies. Prerequisite: LDEM 202.

Part 1: The Park
The focus is on the application of spatial theory and design process to a specific site context. Work will develop map-reading skills at various scales; strengthen drawing, lettering, and cross-section representation skills. The emphasis is on landform design in a public park setting (urban and non-urban).

Part 2: The Garden
The garden is a personal, direct and intimate expression of landscape architecture. It is explored here as a contemporary art primarily through the design of individual sites; and, secondarily, through guided research and discussion sessions which explore important works and design theory in the genre. The emphasis is on developing an informed and creative personal approach that inspires while solving practical problems on real sites. The focus here is on residential gardens or gardens pertaining to institutions.

LDEM 207  Landscape Architecture History I 3 cr.
The course surveys the evolution of structures, settlements and landscapes in the western world and the Mediterranean region including the Arab world. The period spans from origins of human societies, to the end of the medieval period. Students will be assessed on written exams, research papers and an individual project. Examination of the history of landscape architecture since Frederick Law Olmsted and of the evolution of the landscape architecture status with emphasis on environmental planning and activism; town planning and the design of infrastructure, park design and garden design. Introduction to the discipline of landscape architecture and architecture in the built environment, concepts and themes in design focusing on historical examples.

LDEM 208  Landscape Architecture History II 3 cr.
The course will explore the evolution of human settlements and structures in the landscapes and survey the development of outdoor space and man’s effort to control his physical environment in the Western world and the Mediterranean including the Arab world. This evolution is studied in relationship to allied fine arts from the Renaissance to the present. The course will also go through the history of Landscape Architecture design as a product of cultural, political, social and environmental factors; it will focus on historical examples of gardens, parks, community, environmental planning and design in a holistic approach to detect trends, to relate yesterday to today, and to question the present and its connection to the future. Prerequisite (only for LDEM students): LDEM 207

LDEM 210  Botany and Plant Ecology for Landscape Architects 3 cr.
This course introduces botany, ecology, and taxonomy of landscape plants. The material highlights how plants function, their ecological importance, and their value for other organisms as well as for people.
LDEM 211  Landscape Horticulture  2.3; 3 cr.
This course covers basic principles of selection and management of landscape plants. Students will learn how to select plants appropriate to site and purpose, and will be introduced to concepts and applications of environmental horticulture and its contribution to the well-being of humans and nature. The course relies on hands on field projects, site visits, essays, and photo-documentation.

LDEM 214  Landscape and Geomorphology  3cr.
This course introduces students to the geomorphological underpinnings of landscape formation and trains them to read the natural and anthropogeomorphic aspects of landscapes.

LDEM 217  Soils in the Landscape  2.3; 3 cr.
This course will examine soils as integral components of the landscape and as a medium for landscaping activities. It is designed to help students 1) acquire a good understanding of the relationship between geology, landform, soil, vegetation and landscape, and 2) implement management actions essential in landscaping, such as soil preparation, soil amendment and fertilization. Emphasis will be placed on soils as a component of Mediterranean ecosystems and land mosaics with special focus on soil resources in Lebanon. Labs and field trips will be organized in order to observe and analyze soils in the environment, and to manipulate soil substrates for optimizing plant growth. Prerequisite: LDEM 214 for LDEM students

LDEM 218  Landscape Ecology  3 cr.
Students will be introduced to the discipline of landscape ecology. The course will focus on the interplay between spatial patterns and ecological processes. It also focuses on detecting and characterizing social and natural patterns of influence on landscapes and landscape dynamics. Implications of landscape pattern and landscape management will also be covered. Prerequisites: LDEM 210 and LDEM 217.

LDEM 219  Plant Material I  0.6; 2cr.
This course will introduce the student to the botanical and horticultural dimension of designed landscapes by focusing on the species and cultivars that are native or introduced to the Mediterranean climate and to semi-arid regions and on species and cultivars that are used in urban areas such as streets, parks, green roofs, vertical walls or containers. In the process of learning about landscape plants, the student will be introduced to the taxonomic, horticultural, ornamental and landscape aspects of approximately 400 plants during the sessions. Emphasis is placed on major categories of herbaceous plants and woody plants used in landscape including trees, shrubs, vines, flowering plants, ornamentals and hedge plants commonly utilized in this region by a combination of experiential activities (walks on the campus and public places), discussions, online resources and homework assignments. The student will also learn the proper selection and usage of these plants in landscape situations, plant assets and liabilities, alternative plants for various situations, and cultural aspects.

LDEM 221  Plant Material II  0.3; 1 cr.
This course will introduce the student to the botanical and horticultural dimension of designed landscapes by focusing on the species and cultivars that are used in edible and medicinal gardens. In the process of learning about landscape plants, the student will be introduced to the taxonomic, horticultural, ornamental and landscape aspects of approximately 200 plants during the sessions. Emphasis is placed on major categories of herbaceous plants and woody edible plants used in landscape including trees, shrubs, and vines. The student will also learn the proper selection and usage of these plants in landscape situations, plant assets and liabilities, alternative plants for various situations, and cultural aspects.
LDEM 222  Studio III: Landscape Planting Design  4 cr.
The course introduces students to the basic principles of designing with plants. Landscape Architecture combines elements of art and science to create a functional, aesthetic and spatial experience of the outdoor space. One initial purpose of designing with plants is to understand how to blend technology (the built environment) into the natural surroundings and to bring natural elements into the built environment. In order to work toward a desirable landscape design and hence successful planting plan, the student will develop a working knowledge of artistic elements, design principles and basic horticultural knowledge of plants. Successful plant composition and layout is obtained with acknowledgement of the importance of plants as a design material that enhances the definition and spatial experience of outdoor spaces. **Prerequisites:** LDEM 216, LDEM 211 and LDEM 219.

LDEM 228  Studio V: Urban Landscape Design  6 cr.
The focus of this studio is “site design in the urban context;” as such, it will enable students to explore the particular challenges of designing in complex urban environments. By their nature, urban environments have multiple layers and meanings and are influenced by an array of forces. Urban landscapes are an amalgam of a myriad of social, cultural, political, economic and ecological processes on physical space. Designing in the urban context therefore requires sensitivity to these many layers and influences. Creative response to the challenges of urban environments means careful attention to the landscape narratives students choose to tell, and how users of a space learn and discover new things from a site. **Prerequisites:** LDEM 204, and LDEM 222.

**Part 1: Understanding and Analyzing Urban Landscape Systems**
The purpose here is to briefly overview basic concepts of urbanism (transportation, infrastructure, zoning laws, real estate markets, economic development, social issues, and so on) with a strong emphasis on understanding urban open spaces and networks through readings. Students will analyze case studies of similar contexts and analyze urban landscape systems pertaining to the study area.

**Part 2: Study Area**
An application of urban design theories to various scales of urban design, with special focus on civic scale design elements and spatial and functional requirements. The end goal is to design a landscape system or site with an urban context.

LDEM 231  Sustainable Water Management Techniques  3 cr.
The course will focus on water as a scarce resource in Lebanon and the region. Students will be exposed to theoretical and practical aspects of sustainable water resources management as related to landscape design namely in the areas of demand efficient water use and management. Students will learn about efficient indigenous and exotic landscape irrigation, surface and subsurface drainage design, rainwater harvesting, and water conservation.

LDEM 241  Studio VII: Landscape Capstone Project I  4 cr.
This course is intended to assist students in selecting an individual capstone project, finding and organizing appropriate information needed for the project, and establishing parameters and questions for the design and development of the project. The studio focuses on an approved design problem requiring individual work, which will serve as a comprehensive examination. Preparation and presentation include a written and graphic problem statement, analysis, and detailed plans, or other approaches approved by the instructor. **Prerequisites:** LDEM 228 and LDEM 246.
LDEM 242  Studio VIII: Landscape Capstone Project II 6 cr.
The Final Year Project (FYP), conducted with a faculty advisor, includes collection, analysis, and interpretation of project information. The final studio covers a variety of projects that may include landscape design projects involving fine arts, urban design, and town planning. Students are expected to achieve a comprehensive understanding of ideas, processes, and concepts. This is the capstone project where students demonstrate their acquired design skills and knowledge. They are expected to develop their design, produce presentation drawings and defend their ideas orally at a professional level. Students are assessed by department faculty. Note: Fulfills the capstone writing intensive requirement for the Landscape Architecture major. Prerequisite: LDEM 241.

LDEM 246  Studio VI: Natural Landscape Design 6 cr.
Sustainability is a pivotal, evolving paradigm of central importance to landscape architecture. It has profound implications on how we think, plan and design landscapes. The studio explores the theory and application of sustainability principles to a broad region (watershed, city) as well as at finer, scales relating to the larger context. The emphasis is on environmental and physical sustainability and understanding connections to social and economic patterns. The overall goal of this studio is to teach students how to plan and implement open space protection at a landscape scale. This will require the ability to synthesize information about natural features, cultural resources, and development patterns to create spatial landscape strategies (such as greenway networks, ecological networks, green infrastructure) that address the unique problems and opportunities of a chosen study area. Prerequisite: LDEM 228.

LDEM 247  Site Engineering I 3 cr.
Study of techniques essential to the horizontal and vertical development of site designs; emphasis on grading, cut and fill calculation, storm-water drainage and management, erosion control, road alignments and earthwork. This is a lecture course with intensive exercises for engineering calculation and drawing techniques.

LDEM 248  Site Engineering II - Construction Material 3.2; 3 cr.
This studio course will serve as a capstone to Landscape Architectural Construction with emphasis on understanding and preparing complete sets of construction documents for landscape architecture projects. It includes methods and procedures necessary for transforming a design idea into a set of construction drawings that is accurate, precise, and clearly understood; and the principles, processes, and techniques of site engineering for the "hard" and "soft" elements of landscape architecture and surfaces, including wood construction, free-standing and retaining walls, pavement, steps, decks, lighting, and planting irrigation. Students will also implement their designs through hands on experience. Prerequisite: LDEM 247.

LDEM 249  Site Engineering III - Design Implementation 3.5; 4 cr.
This course includes presentation and classification of landscape construction and materials; material types and measurement standards of construction elements. Floor elements: paving materials, pedestrian ways, stairs and ramps. Border and enclosure elements: walls, fences. Shelter elements: pergolas and gazebos. Water elements: ponds, waterfalls, pools and fountains. Outdoor space, furniture and ornaments: benches, litterbins, lighting elements, pedestrian bridges, decks. Interactions between: materials, buildings, spaces, and humans. Research studies and case studies: for designing original landscape constructions and materials. This studio course will focus on lectures, exercises and projects dealing with landscape equipment, and design methods. In addition, students have exposure to measuring quantities and defining specifications. Prerequisites: LDEM 247 and LDEM 248.
LDEM 251  Geographic Information System (GIS)  2.3; 3 cr.
The goal of this course is to explore various approaches to modeling landscape pattern and change. The focus is on the design and use of computerized geographic information systems for land planning and design decisions and in understanding, describing, and predicting land-use and land-cover. The course will move between social and ecological processes and applications of the models. Students will learn to evaluate the trade-offs associated with use of a particular modeling approach within a given situation, and to implement (at least minimally) several of the approaches discussed.

LDEM 252  Computer Aided Design  2.3; 3 cr.
This is an introductory course that covers Computer Aided Design digital drawings to develop skills for Landscape Architects to communicate, create, and implement. The course includes lectures and computer labs focused on learning the basic commands for drawing in two dimensions including: absolute and relative coordinates, working in layers, paper and model space, manipulation of text, and plotting. The focus is on understanding the software environment and basic applications of, AutoCAD and using relevant tools of this graphic design software to develop high quality landscape design graphic outputs, such as diagrams, perspectives, sections, plans and 3D models. These skills will enable students to employ computer graphic design tools in landscape architecture studios throughout the rest of their degree courses.

LDEM 260  Contemporary Issues in Landscape Architecture  3 cr.
This course addresses recent trends in landscape architecture that cover the multitude of approaches, in order to broaden the students’ theoretical knowledge, to encourage their critical and analytical abilities, their understanding of systems and of the landscape as a cultural expression. The course discusses recent interventions by Landscape Architects in different parts of the world and assesses them in relation to their natural, cultural and socio-economic contexts. At the same time students are asked to critically evaluate the current open space situation in Beirut and discuss ideas and approaches related to it. Prerequisites (only for LDEM students): LDEM 207 and LDEM 208.

LDEM 263  Landscape Appreciation and Site Analysis  3 cr.
This course introduces students to specific landscapes of Lebanon and teaches them how to read the spaces by analyzing the interrelationship between natural conditions and human settlement, and land use over time. Prerequisite: LDEM 291.

LDEM 265  Landscape Management  2.3; 3 cr.
This course is designed to help students develop landscape management and maintenance expertise and practical skills by building on knowledge acquired in previous science courses (landscape horticulture, soils in the landscape and sustainable water management techniques) and learn implementation and management actions essential in landscaping. Prerequisites: LDEM 211, LDEM 217 and LDEM 231.

LDEM 290  Professional Practice  3 cr.
The course discusses the professional practice of landscape architecture. It is structured to give students an overview of the professional opportunities, roles and responsibilities within which graduates of the program will most likely practice their trade. The course will be structured as a series of lectures, workshops, discussions and presentations from practicing landscape architects, engineers, and other professionals who will expose the students to the different
aspects of the trade. It introduces basic issues in the practice and the profession of landscape architecture, challenging the student to critically examine professional, ethical, economic, political, social and other issues in the current practice. It covers the different typologies of landscape projects, firms and clients and introduces the full cycle of a landscape project from award and conception to construction and site supervision.

LDEM 291 Surveying and Base Plan Development 2.3; 3 cr.
The course focuses on the fundamentals of plan surveying: basic measurement of distance, angle and elevation; use of basic surveying equipment: total station, levels and tapes, field notes; and basic computations: traverse closure and determination of areas. It is comprised of lectures and studio projects dealing with earthwork estimating; storm water management, site surveys, site layout, and horizontal and vertical road alignment. Students will survey a site and transform measurements into a base plan essential for any design process. This will include features such as: topographic contours, spot levels, structures, vegetation, water ways and utilities.

LDEM 292 Internship (Practicum) 2 cr.
The objective of the landscape architecture internship is to offer the students the opportunity to broaden their educational experiences by actively participating in a professional landscape architecture, planning and/or engineering office environment. The intention is to provide an opportunity for exploring the world of landscape architectural practice through professional activities and reflective activities that address educational goals and objective.

Elective Courses for the Bachelor of Landscape Architecture

LDEM 203 The Environment and Sustainable Development 3.0; 3 cr.
An introduction to sustainable development: concepts, goals, and economic and social aspects; environmental issues associated with development: natural resource management, population, food production, and energy; institutional framework; standards and policies; emerging technological applications and their impacts; resolution of environmental conflicts; and future trends.

LDEM 209 Plant Biology 2.3; 3 cr.
An introduction to botany and to the general principles of plant biology. The course material is aimed at developing an understanding and appreciation of the interaction of plants with their environment, and at providing applications and insights relevant to landscape students.

LDEM 229 Turfgrass Culture, Machinery, and Management 2.3; 3 cr.
An introduction to turfgrass use, establishment, and management. This course focuses on the environmental impact of turfgrass landscapes in arid regions. Students are introduced to the machinery used in landscape management.

LDEM 230 Water and the Environment 3 cr.
This is an introductory course in water resources management emphasizing physical hydrological processes and the interactions between these and the natural environment and the role of human activities in these interactions. This course covers a broad range of topics: e.g. the hydrologic cycle, watershed hydrology, runoff generation, groundwater, point and
nonpoint sources of pollution, best management practices and a multitude of water quality issues. Local, regional and international case studies will be covered along with short field trips to foster a better understanding of water quality and quantity concepts, applications, and principles (Open to all except LDEM students).

**LDEM 254  Regional and Community Studies**  
1.3; 3 cr.
Up to 10 landscape design students will be selected to be part of this course. The Department will identify a community-driven project in which local and possible international students will participate. The target community will be selected at least 6 months prior to the start of the summer semester. The selection process will depend on input from outreach activities performed by the department and by other academic units with which the department coordinates closely with, such as NCC and CCECS. This course focuses on applied knowledge and is thus taught by doing i.e., creating a design that is ready to be applied and a full proposal. Landscape designed elements are thus, site/context dependent therefore, applied ecology and cultural landscape history are important to concept development. Students enrolled in the course will work fourteen days on-site with community partners and will stay with local families during that period and spend 1 week working on the design and proposal on campus. Working together in groups, students will create a practical design. Using a combination of lectures, discussions, interactions with nature, hands-on projects, and community immersion, students will analyze the local environment and design holistic systems that meet the needs of people while respecting the needs of nature.

**LDEM 261  Spatial Structure and Movement**  
3 cr.
The course is concerned with the experience of outdoor and indoor spaces, and the direct influence the placement of any object has on the perception of the latter and the movement within. The course is based on the assumption that the notion of movement and body proportion for mankind has been a primary design tool throughout history, and will try to reevaluate this tool for contemporary design.

**LDEM 262  Healing Gardens: Theoretical Perspectives and Applications**  
3 cr.
This course is offered relative to the current view that an outdoor garden at health care facility is an essential supplement to medical interventions. Introducing the concepts of healing environments in terms of medical geography and environmental psychology, the course proceeds to examine prevailing approaches to the design of healing gardens at medical settings in the present day. Theoretical perspectives from social sciences are used to interpret these healing places as well as those associated with historic precedents for healing - The Japanese garden and the landscape traditions of medieval Christianity and Islam.

**LDEM 264  Interior Landscaping**  
2.3; 3 cr.
An introduction to the principles and practices of interior landscaping with an emphasis on plant selection and handling, environmental conditions, specifying and maintaining healthy plant materials, developing portfolios of interior landscape designs for proper installation of drainage and irrigation.

**LDEM 270  Ornamental Plants for Dry Landscapes**  
3 cr.
A survey of native, wild, and domesticated plants adapted to dry areas with potential use in dry landscapes, with an overview of the different environmental and physiological factors that determine plant growth and developments under such dry conditions.