Master’s Degree Course: Sustainable Management of the Mediterranean Countryside

Course: Forest land management and forest fire protection (9 CFU)
(6 CFU Lectures + 3 CFU Practice)

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Educational Objectives

The discipline aims to provide knowledge related to the analysis and management of Mediterranean landscapes (agro-forestry systems) with particular attention to aspects of data acquisition and spatial information and their processing using computerized technologies and tools, such as Remote Sensing, LiDAR, GIS (Geographic Information Systems) and G.P.S. (Satellite Positioning Systems).

Acquired Skills

The goal is to provide students with the knowledge necessary to operate within the public administration sector or as consultants in the analysis and management of landscapes with specific expertise in the field of computerized processing through the use of leading-edge tools and technologies. The expected learning outcomes, in terms of knowledge and skills, are provided in Annex A of the Academic Regulations of the Degree (expressed through the European Descriptors of the qualification; area Forestry and Environment).

Program (1 CFU for Lectures = 8 hours; 1 CFU for Practice= 14 hours)

<table>
<thead>
<tr>
<th>Topics</th>
<th>N. CFU</th>
<th>Number of hours</th>
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<tbody>
<tr>
<td>Introduction to Landscape Management</td>
<td>2</td>
<td>Lecture 16, Practice 0</td>
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<tr>
<td>Course introduction.</td>
<td>2</td>
<td>Lecture 16, Practice 0</td>
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<tr>
<td>Definition of landscape.</td>
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<td>International overview of the discipline.</td>
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<td>Agro-forestry systems and natural ecosystems.</td>
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<td>Complexity, resistance, resilience.</td>
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<tr>
<td>Agro-forestry systems in the Mediterranean region</td>
<td>2</td>
<td>Lecture 16, Practice 0</td>
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<tr>
<td>Patterns, processes and dynamic.</td>
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<tr>
<td>Structural model as reference</td>
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<tr>
<td>Definition of patches, matrix and ecological corridors</td>
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<tr>
<td>Structural and spatial characters of patches. Functional and evolutive components.</td>
<td>2</td>
<td>Lecture 16, Practice 0</td>
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<tr>
<td>Factors of disturbance: fragmentation and forest fires.</td>
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<td>Spatial mechanism of fragmentation.</td>
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<tr>
<td>Effects of fragmentation on species and communities.</td>
<td>2</td>
<td>Lecture 16, Practice 0</td>
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Theories and principles

Introduction to the fundamental theories in landscape management
Theory of islands biogeography.
Hierarchy theory and properties of scale in ecology.
Population demography theory.
Metapopulation theory,
Theory of source-sink systems.
Ecological networks, stepping stones and corridors.

Methods for landscape assessment

Structural analysis of the landscape
Numerical indices

1.5 4 14
Spatial statistics and spatially-explicit models.
Remote sensing of vegetation.
Multi-temporal and multi-scale assessment.

**Geographical information systems (GIS)**
- Introduction to GIS
- GIS components
- Vector and raster models
- Spatial analysis
- Digital elevation models and LiDAR point-cloud
- GIS and GPS
- Tool Fragstat 3.0
- Spatial analysis of forest fires

**Forest fire prevention and protection**
- Main characteristics of forest fire in the Mediterranean region.
- Analysis of the main factors of wildfire
- Analysis of frequency and incidence
- Fire behaviour simulation models
- Fuel load assessment
- Wild-land urban interfaces and wildfires

| Total | 9  | 48 | 42 |

**N.B.: the total number of CFU credits and the division between lectures and practical activity are given in the Academic Regulations of the relevant Security Council. Strict adherence is required to these and related module hours.**

### Exams

For students enrolled in the course year in which the teaching is done there will be a mid-term exam. The mid-term exam will be oral. The outcome of this exam contributes to the final evaluation and is valid for one academic year.

The exam consists of an oral test on the topics developed during the hours of theory and practice in the classroom and in the field, as reported in the Academic Regulations for the Master (article 10) and in the study plan (Annex A).

The evaluation of the student's preparation is based on pre-established criteria, as detailed in Annex A of the Degree Regulations. For students who took the mid-term exam, the final evaluation is expressed taking into account the result of the mid-term exam.
Study material


Bibliographic and other material

Scientific journals:

- Urban Forestry and Urban Greening, Elsevier
- Landscape and Urban Planning, Elsevier
- Landscape Ecology, Springer

Office hours

- Wednesday: 10.00-13.00
- Friday: 10.00-13.00

Teaching aids

- Class notes and other educational materials provided by the professor throughout the course.
- Reference texts found in the library.