Universitat de Lleida

DEGREE CURRICULUM

ST NI PRECISION FORESTRY

Coordination: VEGA GARCÍA, CRISTINA

Academic year 2019-20

Subject's general information

Subject name	ST NI PRECISION FORESTRY
Code	111005
Semester	ANUAL CONTINUED EVALUATION
Typology	<table><tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr><tr><td>Master's Degree Erasmus Mundus in Spatial and Ecological Modelling in European Forestry</td><td>2</td><td>COMPULSORY</td><td>Attendance-based</td></tr></table>
Course number of credits (ECTS)	3
Type of activity, credits, and groups	<table><tr><th>Activity type</th><td>PRACAMP</td><td>PRALAB</td><td>TEORIA</td></tr><tr><th>Number of credits</th><td>0.6</td><td>1.2</td><td>1.2</td></tr><tr><th>Number of groups</th><td>1</td><td>1</td><td>1</td></tr></table>
Coordination	VEGA GARCÍA, CRISTINA
Department	AGRICULTURAL AND FOREST ENGINEERING
Teaching load distribution between lectures and independent student work	1 ects is 10h presential activity, 15h independent work
Language	English only
Distribution of credits	40% theory, 60% Practice, 3 ects

Teaching staff

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
PROFESSOR PENDENT ASSIGNAR		3	

Subject's extra information

Introductory course to forest inventory and stand structure analysis with high spatial resolution sensors (drones, LiDAR).

A minimum background or previous course on GIS and forest mensuration is necessary to complete the analyses in the computer labs.

Learning objectives

To analyze and spatialize forest inventory plot and stand structure data for different ecosystem services by using high spatial resolution sensors (drones, LiDAR)

Significant competences

Students will be able to apply the theory and practice behind high-resolution sensing technologies and make informed decisions about its possible applications in Forestry.

Students learn the underlying principles of drone and LiDAR data collection, the preparation of point cloud datasets for visualization and use in ArcGIS and in open source software, the statistical analysis of point datasets to derive additional information on forest composition, stand structure and condition, and the integration with field inventory data (plots) to develop spatial predictions of forest stand attributes across landscapes.

Subject contents

1. Classification and type of precision forestry sensors

2. Managing, understanding, visualizing and storing point cloud data after query and download. Sources of data.

3. Building DEMs and DSMs.

4. Deriving metrics from the point cloud and calculating vegetation characteristics: i.e. tree height or biomass density.

5. Development of footprint-, plot- or stand-scale predictions of forest structure.

6. Applications to forest inventory, wildfire management and wildlife habitat conservation: Study cases.

Methodology

The classes are organized by the students according to flipped learning strategies with materials provided by the instructors. Study cases are analyzed, individually and jointly, for formative evaluation. Lab exercises are

conducted, and field trips allow acquiring field data for validation of models. ArcGIS, FUSION and MS Excel (or R) are used to explore LAS point clouds for inferring forest stand traits (composition and structure), and the spatial modelling of forest inventory metrics.

Development plan

Scheduling is by agreement with the students at the beginning of the course.

The course will be coordinated with other courses in the same programme.

Evaluation

Grading is based on the resolution of individual study cases and collaborative work, presentations and other activities (seminars, labs, etc.).

Bibliography

You can access general materials through the Catalog in our digital library system: http://www.bib.udl.es/ and particularly the Sakai site of the course, where all required materials are provided.