CFA 3.1 Course title: Coastal dynamics and environmental evaluation

Modality: Advance Training

Course Dates: 4, 5, 6, 7 June 2019

Timetable: 10-15h

Duration: 20h

Location: Videoconference room at CITEXVI, CUVI

Language: English

Academic coordinators:

Name	Institution	e-mail
Julia Armesto González	University of Vigo	julia@uvigo.es

Lecturers:

Name	Institution	e-mail
Julia Armesto González	University of Vigo	julia@uvigo.es
Jose Luis Lerma	Universidad Politécnica de Valencia	jllerma@cgf.upv.es
José Alberto Gonçalves	Universidade de Porto	jagoncal@fc.up.pt
Alejandro Avila	AEROMEDIA	alejandro.avila@aeromedia.es

General description:

The course focuses on the cartographic technologies that allow the evaluation and monitoring of coastal environment: transport processes on the coast, sedimentary balance and coastal geomorphology, evolution of coastal systems and analysis of natural and anthropogenic risks. The UAV platforms that can be used for this end are presented and described, as well as the available sensors, either LiDAR, optical or multispectral cameras. The fundamentals of photogrammetry and LiDAR technologies are described following a demonstrative approach.

Contents:

• Session 1: Geomatic Technologies and Coastal Cartography
- Introduction to satellite, areal and terrestrial cartographic technologies: last advances in platforms and sensors.
- Data structures.
- Fundamentals of photogrammetry.
- Data processing techniques

• Session 2: UAVs in coastal dynamics: theory and practice (I)
- Introduction and historical review
- Platforms and cartographic solutions on board drones
- Workshop: real flight sample and data collection

• Session 2: UAVs in coastal dynamics: theory and practice (II)
- Application to coastal cartography and environmental assessment.
- Change detection techniques.
- Workshop: practical case of digital processing of UAV photogrammetric images.

• Session 4: UAV LiDAR technologies in coastal dynamics: theory and practice (II)
- Fundamentals of LiDAR systems
- Processing of LiDAR data
- Workshop: real flight simple, data collection and visualization

Teaching methodologies:

The contents will be taught in a magisterial session, supported by audiovisual projections, showing practical cases with data and software whenever possible. They will be complemented by practical workshops to facilitate the understanding and appreciation of the potential of the tools analyzed.

Evaluation system:

Students will be evaluated by continuous observation (minimum attendance of 75% is required).

Brief CV of the lecturers:

Prof. Dr. José Alberto Gonçalves: Senior Lecturer in the Area of Cartographic Engineering in the Department of Geosciences, Environment and Land Planning, Science Faculty, University of Porto. He is a Doctor from the University College of London, Departament of Geomatic Engineering, 2001. He is a member of the CIIMAR, Interdisciplinary Center of Marine and Environmental Research, and of the Mobile Scanning and Imaging Systems Commission for 3D Surveying and Mapping (ICWG I / Va) of ISPRS, International Society of Photogrammetry and Remote Sensing, the international reference association in the field of geomatics. Author of 26 articles in indexed publications with scientific impact.

Prof. Dr. Jose Luis Lerma: Doctor in Cartography and Geodesy from the Polytechnic University of Valencia; full professor of the Cartographic Engineering area at the same University. He is the principal researcher and founder of the Photogrammetry and Laser Scanning Research Group, and is coordinator of the Geomatics Engineering Doctorate Program at the UPV. Expert in Cartographic Engineering, Civil Engineering and Environmental Engineering. He is the author of more than 40 articles in publications of international impact.

Alejandro Avila is director of the Inspection Area of the company AEROMEDIA, a pioneer in the Autonomous Community of Galicia in carrying out LiDAR surveys. They have a multicopter type UAV equipped with a LiDAR sensor on board.

Relevant references: