Course title: Principios de teledetección. Aplicaciones a la monitorización de océanos y costas

Remote sensing principles. Applications to the monitoring of oceans and coasts

Modality: CFT- Transversal Training Course

Orientation:
- ☐ Ocean Observation and Global Change
- ☐ Sustainable use of Marine Resources
- ☐ Integral Management of the Sea
- X   Technological progress. Engineering and Business Management

Dates: June, 6-10, 2022

Timetable: 9:00 -11:00 am

Duration: 10 hours

Location: Universidade de Vigo – Universidade da Coruña. Videoconference connection for remote

attendance.

Language: English

Academic coordinators:

Name	Institution	e-mail
Verónica Santalla del Río	Universidade de Vigo	veronica@uvigo.es

Lecturers:

Name	Institution	e-mail
Vicente Díaz Casas	Universidade da Coruña	vicente.diaz.casas@udc.es
Andrés Figuero Pérez	Universidade da Coruña	andres.figuero@udc.es
José Sande González-Cela	Universidade da Coruña	jose.sande@udc.es
Veronica Santalla del Río	Universidade de Vigo	veronica@uvigo.es
Lucía Santiago Caamaño	Universidade da Coruña	lucia.santiago.caamano@udc.es

General description:

This course presents an introduction to the active and passive systems used for the remote sensing of the coasts and oceans. Examples of practical applications will be presented and discussed

Contents:

The contents of the course are organized in five sessions of 2 hours.

Session 1: Remote sensing fundamentals. The electromagnetic spectrum. Scattering and emission.

Session 2: Passive remote sensing. Radiometer systems. Radiometer principles. System parameters.

Session 3: Active remote sensing. Synthetic Aperture Radar. Principles of operation. System parameters

Session 4: Applications of remote sensing for maritime safety: determination of risk areas

Session 5: Remote sensing in coastal engineering and measurement of ocean-meteorological variables

Teaching methodologies:

Lectures.

Evaluation system:

Attendance and short answer test

Brief CV of the lecturers:

Vicente Díaz Casás
Associate Professor of the Engineering School, (UDC). He has been the Coordinator of the MSc on Marine Eng. and Naval Architecture in the UDC and the Deputy Director of International relationships of Engineering School (UDC) since 2017. He is head of the Naval and Oceanic division of the Integrated Group For Engineering Research. Its research has been focused on the design, installation and maintenance of small ships and offshore structures. He is member of the Spanish Marine Energy Working Group and academics committees of the Spanish Institute of Engineering.

Andrés Figuero Pérez
PhD in Civil Engineering from the University of A Coruña. Head of projects of ports and coasts in the Water and Environmental Engineering Group (GEAMA) of the University of A Coruña. Currently he combines his work as a researcher with teaching in the area of hydraulics at the ETS of Civil Engineering of this university.
Since 2013, he has been working as a researcher in the Maritime and Port Engineering Area of the Water and Environmental Engineering Group (GEAMA) of the University of A Coruña. His main line of research focuses on the study of port operability by means of field monitoring of the moored ship behaviour. Although port operability is his main line of research, he actively participate in small-scale physical modeling projects, developing optimization works of port structures for both public and private entities.

José Sande González-Cela

PhD Civil Engineering from the University of A Coruña. Professor in the area of hydraulics at the ETS of Civil Engineering of the university Of A Coruña and researcher in the Water and Environmental Engineering Group (GEAMA).

My research area is maritime and port engineering. I lead one of GEAMA's research lines related to the design and optimization of coastal defense structures within which work is carried out on damage analysis and the development of maintenance strategies. In addition, I combine this work with participation in another line of research related to port operations, through field campaigns.

Verónica Santalla del Río

Associate Professor of the Engineering School on Telecommunication (UVigo).

She has been with the Departament on Signal Theory and Communications, University of Vigo, since 1990.

Her current research interests include signal processing algorithms for polarimetric weather radar and volume and rough surface scattering modelling for microwave remote sensing applications.

Lucía Santiago Caamaño

Part time assistant professor of the Higher Polytechnic School (UDC) and part time research associate at Integrated Group for Engineering Research (UDC).

She holds MSc and a PhD on Naval Architecture and Marine Engineering. Her research fields include ship behaviour, real-time stability monitoring, stability guidance systems and towing tank tests.

Relevant references:

F. Ulaby, R.K. Moore, A.K. Fung, "Microwave Remote Sensing. Active and Passive", Vol I: Microwave Remote Sensing Fundamentals and Radiometry, Addison-Wesley Publishing Company, 1981

N. Skou, Microwave Radiometer Systems: Design and Analysis, Artech House, 1981

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Puente, I., Sande, J., González-Jorge, H., Peña-González, E., Maciñeira, E., Martínez-Sánchez, J., & Arias, P. (2014). Novel image analysis approach to the terrestrial LiDAR monitoring of damage in rubble mound breakwaters. Ocean Engineering, 91, 273-280. doi:10.1016/j.oceaneng.2014.09.011

Isabel Caballero, Richard P. Stumpf. On the use of Sentinel-2 satellites and lidar surveys for the change detection of shallow bathymetry: The case study of North Carolina inlets, Coastal Engineering, Volume 169, 2021, 103936, https://doi.org/10.1016/j.coastaleng.2021.103936.

Yang, J.; Zhang, J.; Jia, Y.; Fan, C.; Cui, W. Validation of Sentinel-3A/3B and Jason-3 Altimeter Wind Speeds and Significant Wave Heights Using Buoy and ASCAT Data. Remote Sens. 2020, 12, 2079. https://doi.org/10.3390/rs12132079