UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: PHOTOINTERPRETATION AND REMOTE SENSING
Code: 66427
Type: CORE COURSE
ECTS credits: 6
Degree: 404 - UNDERGRADUATE DEGREE GEOGRAPHY, TERRITORIAL DEVELOPMENT AND SUSTAINABILITY
Academic year: 2021-22
Center: 2 - FACULTY OF LETTERS
Group(s): 23
Year: 2
Duration: C2
Main language: Spanish
Second language:
Use of additional languages:
English Friendly: Y
Web site:
Bilingual: N

Lecturer: **RAFAEL UBALDO GOSALVEZ REY** - Group(s): **23**

Building/Office	Department	Phone number	Email	Office hours
Facultad de Letras/3.26	GEOGRAFÍA Y ORD. TERRITORIO	3172	rafaelu.gosalvez@uclm.es	

2. Pre-Requisites

It would be convenient to have knowledge or to have previously studied subjects related to Physical and Human Geography, Cartography and GIS.

3. Justification in the curriculum, relation to other subjects and to the profession

The course develops the contents of the subject GEOGRAPHIC LANGUAGES AND TECHNIQUES of the module GEOGRAPHIC TECHNOLOGIES AND KNOWLEDGE SOCIETY of the Degree in GEOGRAPHY, TERRITORIAL DEVELOPMENT AND SUSTAINABILITY and develops contents of the knowledge areas of PHYSICAL GEOGRAPHY, REGIONAL GEOGRAPHIC ANALYSIS and HUMAN GEOGRAPHY. It has a professional character. For the detailed relation with other subjects of the present degree and the professional activity we refer to the corresponding Memory of the Degree.

4. Degree competences achieved in this course

Course competences

Code	Description
CB03	Be able to gather and process relevant information (usually within their subject area) to give opinions, including reflections on relevant social, scientific or ethical issues.
CE04	Integrate knowledge from various social and environmental disciplines in order to describe and interpret the spatial dynamics linked to regional transformations.
CE08	To apply the methods and techniques of geographical analysis especially oriented to the design and management of the instruments of territorial development and protection of the natural and cultural heritage.
CT02	Know and apply the Information and Communication Technologies.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Answer to location questions, differentiation and relation typical of geographical analysis, spatial development and sustainability, by using GIT

Know the spatial processes by comparing images of different times or moments

Know how to interpret the territory using satellite and aerial photography images

Know how to obtain, select and record fotographic information and satellite information from internet and documentation centres

Using software tools of treatment and information management

Ellaborate photo interpretation schemes with a clear and neat presentation

6. Units / Contents

Unit 1: INTRODUCTION TO REMOTE SENSING

- **Unit 1.1** Concept and elements of the remote sensing process
- **Unit 1.2** History
- **Unit 1.3** Funds and availabilities

Unit 2: PHYSICAL PRINCIPLES OF REMOTE SENSING

- **Unit 2.1** Electromagnetic spectrum. Types, physical laws and units of measurement
- **Unit 2.2** Interactions with the atmosphere. Composition, disturbances and atmospheric windows
- **Unit 2.3** Interactions with the Earth's surface: Albedo and spectral signature

Unit 3: SENSORS, PLATFORMS AND DATA ACQUISITION SYSTEMS

- **Unit 3.1** Sensors. Definition and types.
- **Unit 3.2** Resolution of a sensor.
- **Unit 3.3** Spaceborne and airborne platforms

Unit 4: BASIS FOR IMAGE INTERPRETATION: DIGITAL ANALYSIS

Unit 4.1 QGIS and Remote Sensing. Visualization of images.
Unit 4.2 Geometric and radiometric corrections
Unit 4.3 Extraction of thematic information.

Unit 5: BASIS FOR THE INTERPRETATION OF IMAGES. VISUAL ANALYSIS

Unit 5.1 Fundamentals. Types of stereoscopes. The pair and the stereoscopic triplet
Unit 5.2 Elements and criteria in visual analysis.
Unit 5.3 Practical applications of photointerpretation in Geography

Unit 6: INTRODUCTION TO REMOTELY PILOTED AIRCRAFT SYSTEM (RPA)

Unit 6.1 Introduction to RPAS. Aeronautical regulations
Unit 6.2 Flight systems: aircraft knowledge and operational procedures
Unit 6.3 Practical applications of RPAS in Geography

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Combination of methods	CB03 CE04 CE08 CT02	1.2	30	Y	Y	They are aimed at presenting and discussing in the classroom the general and methodological concepts of the contents set out in the syllabus.
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	CB03 CE04 CE08 CT02	1.2	30	Y	Y	They are aimed at putting into practice the general and methodological concepts of the contents set out in the agenda.
Analysis of articles and reviews [OFF-SITE]	Reading and Analysis of Reviews and Articles	CB03 CE04 CE08 CT02	0.4	10	Y	Y	Students will be required to read and review a series of articles published in scientific journals selected by the teacher in which the use of remote sensing and photo interpretation are put into practice.
Practicum and practical activities report writing or preparation [OFF-SITE]	Practical or hands-on activities	CB03 CE04 CE08 CT02	1.6	40	Y	Y	The objective is to provide the students with different skills and competences through several practical exercises of character and weekly delivery.
Writing of reports or projects [OFF-SITE]	Group Work	CB03 CE04 CE08 CT02	0.8	20	Y	Y	Students will have to work out on their own, organized in work groups, the first three topics of the subject, which also aims to assess their ability to work in groups. The result will be two products: a 15-page topic and its oral defence in public. Both products will be evaluated by the teacher taking into account the rigor, depth, oral and written presentation, bibliography and documentation used
Portfolio Development [OFF-SITE]	Guided or supervised work	CB03 CE04 CE08 CT02	0.8	20	Y	Y	The practices carried out, the team work and the class notes will be gathered in a Portfolio that will be given by the student to the teacher at the end of the course.
		Total:	**6**	**150**			
		Total credits of in-class work: 2.4					**Total class time hours: 60**
		Total credits of out of class work: 3.6					**Total hours of out of class work: 90**

As: Assessable training activity
Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Projects	30.00%	30.00%	Students will have to work out the first three topics of the course in working groups, which also aims to assess their ability to work in a group. The result will be two products: a 15-page topic and its oral defence in public. Both products will be evaluated by the teacher taking into account the originality, the formal oral and written presentation, the theoretical contents and the use of the bibliography and documentation used. The rest of the students will be obliged to participate in the evaluation of the oral presentation.
Portfolio assessment	70.00%	70.00%	The objective is to provide the student with different skills and competences through several practical exercises delivered weekly. These practices, together with the teamwork and the

			class notes will be gathered in a Portfolio that will be given by the student to the teacher at the end of the course.
Total:	**100.00%**	**100.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

Projects: formal presentation, treatment of theoretical content, originality, use of bibliography, oral defence, degree of autonomy and attitude towards work will be valued.
Practices to be included in the portfolio: the organization and cleanliness of each practice, the application of the theoretical contents, the degree of autonomy and the attitude of the student and the fulfilment of the delivery date will be evaluated.
Portfolio: the following criteria will be taken into account: order and coherence of the contents, creative presentation, existence of a cover and index, inclusion of the teaching guide and the materials provided by the teacher, inclusion of the group work, inclusion of all the practices

Non-continuous evaluation:

Given the characteristics of the proposed assessment system, no adaptation is required for those students who cannot regularly attend class or in the event of a new confinement due to a new COVID19 alarm condition. In these cases, tutorials through MSTeams and teacher guidance through Virtual Campus provide sufficient elements to obtain the maximum benefit of the subject by the student.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours **hours**

Unit 1 (de 6): INTRODUCTION TO REMOTE SENSING

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	1
Writing of reports or projects [AUTÓNOMA][Group Work]	6
Portfolio Development [AUTÓNOMA][Guided or supervised work]	3

Teaching period: 1 week

Group 23:

Initial date: 02-02-2022 **End date:** 03-02-2022

Unit 2 (de 6): PHYSICAL PRINCIPLES OF REMOTE SENSING

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	2
Writing of reports or projects [AUTÓNOMA][Group Work]	7
Portfolio Development [AUTÓNOMA][Guided or supervised work]	3

Teaching period: 1 week

Group 23:

Initial date: 09-02-2022 **End date:** 10-02-2022

Unit 3 (de 6): SENSORS, PLATFORMS AND DATA ACQUISITION SYSTEMS

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	2
Writing of reports or projects [AUTÓNOMA][Group Work]	7
Portfolio Development [AUTÓNOMA][Guided or supervised work]	3

Teaching period: 1 week

Group 23:

Initial date: 16-02-2022 **End date:** 17-02-2022

Unit 4 (de 6): BASIS FOR IMAGE INTERPRETATION: DIGITAL ANALYSIS

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	4
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	12
Writing of reports or projects [AUTÓNOMA][Group Work]	14
Portfolio Development [AUTÓNOMA][Guided or supervised work]	3

Teaching period: 4 weeks

Group 23:

Initial date: 03-02-2022 **End date:** 17-03-2022

Unit 5 (de 6): BASIS FOR THE INTERPRETATION OF IMAGES. VISUAL ANALYSIS

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	15
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	12
Analysis of articles and reviews [AUTÓNOMA][Reading and Analysis of Reviews and Articles]	30
Writing of reports or projects [AUTÓNOMA][Group Work]	26
Portfolio Development [AUTÓNOMA][Guided or supervised work]	4

Teaching period: 6 weeks

Group 23:

Initial date: 23-03-2022 **End date:** 21-04-2022

Unit 6 (de 6): INTRODUCTION TO REMOTELY PILOTED AIRCRAFT SYSTEM (RPA)

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	6
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	6
Portfolio Development [AUTÓNOMA][Guided or supervised work]	4

Teaching period: 3 weeks

Group 23:

Initial date: 28-04-2022 **End date:** 12-05-2022

Global activity

Activities	hours
Analysis of articles and reviews [AUTÓNOMA][Reading and Analysis of Reviews and Articles]	30
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	30
Class Attendance (theory) [PRESENCIAL][Combination of methods]	30
Portfolio Development [AUTÓNOMA][Guided or supervised work]	20
Writing of reports or projects [AUTÓNOMA][Group Work]	40
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
VIRUES ORTEGA,D. y GARCÍA-CABAÑAS BUENO, J.A.	Piloto de dron (RPAS	Ediciones Paraninfo, S.A.		8428338736	2016	
FERNÁNDEZ GARCÍA, F.	Introducción a la fotointerpretación	Ariel Geografía	Barcelona		2000	
IGN	IBERPIX. Visualizador cartográfico y de imágenes. https://www.ign.es/iberpix2/visor/	CNIG	Madrid		2021	
SOBRINO, J.A.	Teledetección	Servicio de Publicaciones de la Universidad de Valencia.	Valencia		2000	
SANDOVAL RAMÓN, L	Geomorfología	Ministerio de Defensa	Madrid		1991	
LÓPEZ VERGARA, Mª. L.	Manual de fotogeología	Publicaciones Científicas del Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas	Madrid		1988	
CHUVIECO, E.	Fundamentals of Satellite Remote Sensing. An Environmental Approach	CRC Press (Taylor & Francis Group)	Flodira (USA)	978-1-138-58383-2	2020	
Google Inc.	Google Earth https://www.google.es/intl/es_es/earth/	Google Inc.	EE.UU.		2021	
LILLESAND, T.; HIEFER, R.W. y CHIPMAN, J.	Remote sensing and image interpretation https://www.wiley.com/en-gb/Remote+Sensing+and+Image+Interpretation%2C+7th+Edition-p-9781118343289	Wiley	USA	978-1-118-34328-9	2015	
ESTEBAN HERREROS, J.L. (coord.)	Los Drones y sus Aplicaciones a la Ingeniería Civil https://www.fenercom.com/wp-content/uploads/2015/03/Los-Drones-y-sus-Aplicaciones-a-la-Ingenieria-Civil-fenercom-2015.pdf	FENERCOM-Comunidad de Madrid	Madrid		2015	
PAINE, D.P. & KISER, J.D.	Aerial Photography and Image Interpretation, Third Edition https://onlinelibrary.wiley.com/doi/book/10.1002/9781118110997	John Wiley & Sons, Inc.			2012	
FAHLSTROM, P.G. & GLEASON, T.J.	Introduction to UAV Systems. 4th Edition	Wiley	UK		2012	