

COURSE SYLLABUS

Academic Year: 2022/2023

Identification and characteristics of the course			
Code	500817	ECTS Credits	6
Course title (English)	CARTOGRAPHY AND PHOTOINTERPRETATION		
Course title (Spanish)	CARTOGRAFÍA Y FOTOINTERPRETACIÓN		
Degree programs	Geography and Territorial Planning		
Faculty/School	Philosophy and Letters		
Semester	4	Course type (compulsory/optional)	compulsory
Module	(3) Fundamental contents of Geography		
Subject matter	Techniques and instruments for territorial studies		
Lecturer/s			
Name	Room	E-mail	Web page
ÁLVARO GÓMEZ GUTIÉRREZ	115	alvgo@unex.es	http://campusvirtual.unex.es/portalmiaula
Subject Area	Physical Geography		
Department	Art and Territory Sciences		
Coordinator (Only if there is more than one lecturer)			

Competencies
1. CB2 – Students are able to apply their knowledge to their work in a professional way and they have competencies that are usually shown by means of arguments and solving problems in their study area.
2. CB3 – Students have the skill to collect and interpret datasets, to give opinions including a reflection about important social, scientific and ethics subjects.
3. CG1- Geographical analysis and synthesis.
4. CG3 – Professional use of geographical information technologies and production and interpretation of maps.
5. CG5 – Carrying out territorial studies and designs related to social and economic processes, public policies, landscape and environment.
6. CG4 – Ability to apply knowledge in practice.
7. CT4 - Collect proper information to evaluate and think about scientific, social or ethic subjects.

8. CT8 – To analyse, process and show data by means of digital techniques in the field of Geography.
9. CT12 – To demonstrate knowledge and concern about natural and cultural heritage in the frame of contemporary society and from an interdisciplinary viewpoint.
10. CT13 – To design and manage projects and studies, being responsible and with accurate and objective attitude in the quality of the resulting reports, promoting the contribution of practical and applied solutions to reactivate the relationship University-Society.
11. CT14 – To get use to new situations, being crucial for that the development of skills related to creativity, innovation and motivation for life-long learning.
12. CE12 – To show information using maps, elaborating and interpreting statistical information and managing georeferencing methods.
13 CE6 – Using geographical information as a tool for the description, analysis, interpretation and management of territory.
Contents
Course outline
Theoretical and practical issues about mapping and existing cartographic sources and also methods and techniques to elaborate your own maps
Course contents
Title of unit 1: Introduction to Cartography and Photointerpretation Contents of unit 1: -Form and dimensions of Earth, -Basic concepts of Cartography: representation systems, coordinate systems, scales, legends. -Basic concepts of Photointerpretation: the photograph, marginal information, stereoscopic vision, distortions and corrections. Elaborating orthophotographs. Description of practical activities for unit 1: Practice 1.1-Scales, distances, surfaces and topographic cross-sections, Practice 1.2-Mapping using orthophotographs.
Title of unit 2: Basic maps for the Geographer. Contents of unit 2: -Topographic map. Operations with the topographic map. Digital Elevation models and LIDAR technology. -Geological map. Operations with the geological map. -Geomorphological map. -Cartographic resources, present and historical aerial photographs and orthophotographs in Spain. Description of practical activities for unit 2: Practice 2.1-Digital Terrain Analysis using Digital Elevation Models.
Title of unit 3: Making maps. Contents of unit 3: Instruments and devices for data acquisition: total station, GNSS, Orthophotograph, TLS-LIDAR and terrestrial and aerial (using UAV platforms) automatic photogrammetry (SfM-MVS). -Stereoscopy, photointerpretation of stereoscopic pairs and mapping. Description of practical activities for unit 3: Practice 3.1- GNSS (RTK, PPK), Practice 3.2- LIDAR data, point clouds and Digital Terrain Models, Practice 3.3- Elaborating 3D models using conventional photographs.

Educational activities								
Student workload (hours per lesson)		Lectures	Practical sessions				Monitoring activity	Homework
Lesson	Total	L	HI	LAB	COM	SEM	SGT	PS
1	35,5	7				7,5	1	20
2	34,5	7				7,5		20
3	70	14				15		41
Assessment	10	2						8
TOTAL ECTS	150	30				30	1	89

L: Lectures (100 students)

HI: Hospital internships (7 students)

LAB: Lab sessions or field practice (15 students)

COM: Computer room or language laboratory practice (30 students)

SEM: Problem-solving classes, seminars or case studies (40 students)

SGT: Scheduled group tutorials (educational monitoring, ECTS type tutorials)

PS: Personal study, individual or group work and reading of bibliography

Teaching Methodology

- Lectures.
- Problem-solving classes, presentation of studies, study-cases and projects.
- Personal study of literature and other materials (maps).
- Practices in lab sessions and field surveys.
- Planning students' role in different tasks.
- Personal or group monitoring of learning by tutorials.

Learning outcomes

- To interpret summarized information using cartographic analysis techniques.
- To train students for the search, systematization, analysis and representation of geographical information, graphically and cartographically.
- To manage spatial databases and datasets and representation of these data graphically and cartographically.
- To represent forms and processes that cause landscapes, using fieldwork, Geographical Information Systems and Remote Sensing.

Assessment methods

General Assessment System:

This section is regulated by the DOE 212 de 3 de noviembre de 2020

(<http://doe.gobex.es/pdfs/doe/2020/2120o/20062265.pdf>), where the assessment modalities (art. 4), activities and criteria (5) are described.

The student may choose between assessment modalities introduced in the mentioned regulation (i.e. continuous or global assessment) with the deadline specified below:

- a) **Continuous assessment:** the final mark is composed of tasks and activities (retrievable or non-retrievable) carried out during the course and a final exam.
- b) **Global assessment:** the final mark is obtained, exclusively, from a final exam.

Deadline: the student Will choose the assessment system in the first quarter of the teaching period, by means of a writing request addressed to the coordinator. In the absence of any manifestation, the default assessment option will be the continuous one.

Important: once the student has chosen the assessment modality during the mentioned period, this selection will be valid for the ordinary and extraordinary calls

and modality changes will not be allowed (except for the case described in the art. 4 section 6).

The assessment procedure will be carried out following the R.D 1125/2003, i.e. following a system of numeric marks in a scale from 1 to 10 with a decimal place and qualitative mark.

Specific assessment systems (introduced in the Verifica report)

The subject will be evaluated by:

- Assessment system 1. Written test.
- Assessment system 2. Attendance and active role in the class.

Assessment criteria (continuous assessment mode)

In the ordinary call

a-A written test about theoretical and practical contents that will represent the 80% of the final mark. The test will consist of a set of questions of different nature.

b-Attendance and involvement in class activities, including solving study cases which will account for the 20% of the final mark.

In the extraordinary call

a-A written test about theoretical and practical contents that will represent the 80% of the final mark. The test will consist of a set of questions of different nature.

b-Attendance and involvement in class activities, including solving study cases which will account for the 20% of the final mark. This is a non-retrievable activity hence the result of this section will be the one previously obtained in the ordinary call.

Assessment criteria (global assessment mode)

In the ordinary call

a-A written test about theoretical and practical contents that will represent the 100% of the final mark. The test will consist of a set of questions of different nature.

In the extraordinary call

a-A written test about theoretical and practical contents that will represent the 100% of the final mark. The test will consist of a set of questions of different nature.

Bibliography

- Atkinson, K.B., 1996. Close Range Photogrammetry and Machine Vision. Whittles Publishing, 371 p.
- De Dios-Centeno, J., Jesús-Fraile, M., Otero, M.A. and Jaqueline-Pividal, A., 1994. *Geomorfología Práctica. Ejercicios de Fotointerpretación y Planificación Geoambiental*. Editorial Rueda, Madrid; 66.
- Delgado Martín, J., Padilla Benítez, F. y Barrientos, V., 2010. *Prácticas de Geología: mapas geológicos y problemas*, Universidade da Coruña, E.T.S. de Ingenieros de Caminos, Canales y Puertos, 141 p.
- Dong P. and Chen Q., 2018, LIDAR remote sensing applications, Taylor & Francis, 199 p.
- Goudie, A., 1981. *Geomorphological techniques*. Geomorphological techniques. Allen & Unwin, for the British Geomorphological Research Group.
- Hofmann-Wellenhof, B. and Wasle, E., 2008, *Global Navigation Satellite Systems: GPS, GLONASS, GALILEO & more*, SpringerWienNewyork, 516 p.
- Quiros Rosado, E., 2014. *Introducción a la Fotogrametría y Cartografía aplicadas a la Ingeniería Civil*, Servicio de Publicaciones de la Universidad de Extremadura, 138 p.

Other resources and complementary materials

Scientific journals:

- Boletín de la Asociación de Geógrafos Españoles: <http://age.ieg.csic.es/boletinv.htm>
- Journal of Maps: <http://www.journalofmaps.com/>
- Remote Sensing: <http://www.mdpi.com/journal/remotesensing>
- International Journal of Digital Earth: <http://www.tandfonline.com/toc/tjde20/current#.U4hLKSgXI-o>
- International Journal of Applied Earth Observation and Geoinformation: <http://www.journals.elsevier.com/international-journal-of-applied-earth-observation-and-geoinformation/>

Web pages:

- Geomorfometry: <http://www.geomorphometry.org/>
- Geomorfometry y Spatial Analysis: <http://www.spatial-analyst.net/terrain.php>
- Instituto Geográfico Nacional: <http://www.ign.es/ign/es/IGN/home.jsp>
- Instituto Geológico y Minero de España: <http://www.igme.es/internet/default.asp>
- Infraestructura de Datos Espaciales de España: http://www.idee.es/show.do?to=pideep_pidee.ES
- NSF Open Topography, tools and high-resolution topographic data: <http://www.opentopography.org/>
- Geographical International Union: <http://www.ugi.unam.mx/>
- Sociedad Española de Geomorfología: <http://www.geomorfologia.es/>