Universitat de Lleida

DEGREE CURRICULUM

GIS

Coordination: GUERRERO LLADOS, MONTSERRAT

Academic year 2020-21

GIS 2020-21

Subject's general information

<table>
<tr><td>Subject name</td><td>GIS</td></tr>
<tr><td>Code</td><td>101152</td></tr>
<tr><td>Semester</td><td>1st Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
<table>
<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Bachelor's Degree in Geography</td><td>2</td><td>COMPULSORY</td><td>Attendance-based</td></tr>
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<tr><td>Course number of credits (ECTS)</td><td>6</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><th>PRALAB</th><th>TEORIA</th></tr>
<tr><th>Number of credits</th><td>3</td><td>3</td></tr>
<tr><th>Number of groups</th><td>1</td><td>1</td></tr>
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<tr><td>Coordination</td><td>GUERRERO LLADOS, MONTSERRAT</td></tr>
<tr><td>Department</td><td>GEOGRAPHY AND SOCIOLOGY</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>Theoretical-practical classes: 60 hours
Autonomous work of the student: 90 hours</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
<tr><td>Language</td><td>Catalan and Spanish. English as a language of most of the programs used</td></tr>
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GIS 2020-21

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
GUERRERO LLADOS, MONTSERRAT	montse.guerrero@udl.cat	6	

Subject's extra information

The GIS course is part of the subject "Cartography" of the geography degree curriculum and provides methodological and technical skills for the management and analysis of spatial information. The subject has a strong practical character. It aims to convey the knowledge of the fundamentals of the Geographic Information Systems (GIS) and provide the student with experience in the management of applications and analysis of the information. The efficient and profitable use of GIS must be based on scientific knowledge about geographic information and its methods of analysis, and a good knowledge of cartographic language.

The competences to acquire are fundamental for geographers, especially for those who will devote themselves to the professional exercise-applied researcher. This subject will be complemented by three subsequent GIS courses in the Degree of Geography and two subsequent in the doble bachelor's degree: Geography and Tourism. At the end of the course, the student will acquire the necessary skills to work independently the data with GIS tools in any field.

The use of GIS every day is higher among professionals and scientists of different disciplines, since it allows to manage large volumes of territorial information in all territorial areas.

Learning objectives

Learning outcomes:

- Familiarity with the usual vocabulary and concepts in the use of maps
- Practice of georeferencing at different levels: in the field and a cartographic document
- Reading, comprehension and use of information from topographic maps
- Familiarity with the cartographic resources available online
- Ability to obtain the maximum information from topographic cartography
- Use of thematic cartography programs, both commercial and online
- Full familiarity with the logic of SIG
- Agility in the relation of databases and cartography
- Versatility and adaptability in the use of new cartographic technologies
- Full capacity to design an ideal map for any geographical, physical or human information assumption

Competences

Competences

CG3 Characterize the spatial diversity of the territories

CE2 Acquire the vocabulary and professional tools of the geographer

CB4 Power to transmit information, ideas, problems and solutions to a specialized and non-specialized audience

CB5 Know how to develop those learning abilities necessary to undertake further studies with a high degree of autonomy

CE1 Handle and use the methods and techniques of analysis and interpretation of statistical sources

CE3 Express geographical knowledge through thematic cartography

CE5 Learn how to extract geographical information from existing resources on the Internet

CE11 Acquire the habits of analysis of the geographic data to carry out its exhibition organized and reasoned, either through an oral presentation or through a written report

CE12 Learn the management of GIS software in its different functions: data entry, editing and management, queries and space analysis

CT3 Acquire training in the use of new technologies and information and communication technologies

Subject contents

Module 1: Introduction to ArcMap

Module 2: Geographical data

- Spatial queries
- Unions and spatial relationships
- Creation, edition and management of geographic information
- Georeferencing methods

Module 3: Spatial analysis of vector data. Geoprocessing of spatial data

Module 4: Cartographic resources.

- Main sources of spatial data
- Infrastructure of spatial data (IDE).
- Official cartography producers
- Open Geospatial Consortium
- Geoportals Metadata

Module 5: Practices with ArcGis

Methodology

1. Master classes.

2. Supervision of practices.

3. Carry out learning folder.

4. Drafting of projects.

The development of the subject is supported by the alternation of master classes and practices to the computer, where the teacher guides the student in the management and development of the practice presented. The practices will always develop around a spatial problem that will be given a solution through the use of GIS tools.

The student will also be given a theoretical dossier where the basics of the practices will be developed and also the instructions for developing them.

Development plan

The subject presents a mixed teaching (face-to-face and online through the use of videoconferences). Classes are held on Mondays and Tuesdays. During the course there will be 5 specific practice sessions on Wednesdays in the computer room or by videoconference. These 5 sessions last three hours respectively.

Formative activity	Hours for the training activity
1.- Exposition of basic contents (master class)	20
2.- Practices in the computer classroom or virtual under the supervision of the teacher	40
3.- Self-employed work of the student	90
Total	150

In the event that online classes, sessions can be registered, in this case in accordance with current regulations on data protection of a personal nature, we inform you that:

- The organisation responsible for the recording and use of the image and voice is the University of Lleida - UdL (contact details of the representative: General Secretariat. Plaza Víctor Siurana, 1, 25003 Lleida; sg@udl.cat; contact details of the data protection officer: dpd@udl.cat).
- The recorded images and voices shall be used exclusively for teaching purposes.
- The recorded images and voices shall be saved and preserved until the end of the current academic year, and shall be destroyed in accordance with the terms and conditions specified in the regulations on the preservation and disposal of administrative documents of the UdL, and the documentary evaluation tables approved by the Generalitat de Catalunya (http://www.udl.cat/ca/serveis/arxiu/).
- The voices and images are considered necessary to teach this subject, and teaching is a right and a duty of the teaching staff of the Universities, which they must exercise under academic freedom, as provided for in article 33.2 of the Organic Law of Universities (Ley Orgánica de Universidades) 6/2001, of December 21. For this reason, the UdL does not need the consent of the students to register their voices and images with the sole and exclusive purpose of teaching in this particular subject.
- The UdL shall not transfer the data to third parties, except in the cases strictly provided for by the Law.
- The student can access their data; request correction, deletion or portability; object to its processing and request its limitation, as long as it is compatible with the purposes of teaching, by writing to dpd@udl.cat. You can also submit a complaint to the Catalan Data Protection Authority, via a mail to its website (https://seu.apd.cat) or other non-electronic means.

Evaluation

For the evaluation of this subject, the continuous evaluation process is followed and the weighting of the evidence of evaluation is adjusted to the ECTS. In each one of them, the professor will make the criteria of qualification prior to its correction published.

A) Tests developed in class (50% of the final grade): Consist of practical exercises about the theory and management of a GIS program.

b) Final exam (20% of the final grade) and final work (20% of the final grade): At the end of the course, the student must present a personal work, which contains the approach and implementation of an application "SIG "to an

assumption of medium complexity. The subject of the work is chosen by the student with the approval of the teacher.

C) Assistance with participation (10% of the final grade)

To pass the subject, the student must deliver all the practices and jobs required during the course to measure the result of their individual learning.

Students who combine their degree with a full time job have the right to ask for alternative assessment within 5 days after the beginning of the semester. For information, please send an e-mail to academic@lletres.udl.cat or ask for information at the Faculty's secretary (Secretaria de la Facultat de Lletres).

Bibliography

Basic documentation: pdf files with the development of the syllabus and support material that, as a manual of the subject, the teacher will facilitate the students to the virtual campus (sakai / recursos).

Basic bibliography

- Gutierrez Puebla, J.; Gould, M. (1994). *SIG: Sistemas de información geográfica*. Síntesis. S.A. Madrid. p. 251.

- Moreno Jiménez, A. (2005): Sistemas y análisis de la Información Geográfica. Manual de autoaprendizaje con ArcGis. Editorial Ra-Ma. Madrid. 878 págs.

- Olaya, V. (2016): Sistemas de Información Geográfica. http://volaya.github.io/libro-sig/.

- Peña Llopis, J. (2006): Sistemas de Información Geografica aplicados a la gestión del territorio. Universidad de Alicante. San Vicente (Alicante)

- Santos Preciado, J.M. (2011). Los Sistemas de Información Geográfica vectoriales : el funcionamiento de ArcGis / José Miguel Santos Preciado . 1a. ed. ; 1a. reimp. Madrid : Universidad Nacional de Educación a Distancia. Cuaderno de prácticas.

- Santos Preciados, J.M. (2008): Análisis estadística de la información geográfica. Cuadernos de la UNED. Madrid. 395 págs.

- Bosque Sendra, Joaquín (1997): Sistemas de información geográfica. Ediciones Rialp, S.A., 2ª edición.

Additional bibliography.

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- Calvo Melero, Miguel (1993): Sistemas de información geográfica digitales: sistemas geomáticos IVAP, Instituto Vasco de Administración Pública. Oñati (Guipuzcoa). pp. 616.

- Conesa, C.; Álvarez, Y. y Granell, C. (ed.) (2004). Empleo de los SIG y la Teledetección en Planificación Territorial. Universidad de Murcia.

- Dent, Borden D. (2009) Cartography :thematic map design. - 6a. ed. Boston [etc.] : McGraw-Hill, cop.

- Gómez, M. y Barredo, J.I. (2005): Sistemas de información geográfica y evaluación multicriterio en la ordenación del territorio. Madrid, Ra-Ma.

- Madden, M (ed) (2009). Manual of Geographic Information Systems. ASPRS.

- Miller, H.J. y Shaw, S.L. (2001): Geographic Information Systems for Transportation. Principles and Aplications. Oxford University Press.

-Tomlinson, R. (2008). Pensando en el SIG: planificación de Sistemas de Información Geográfica dirigida a gerentes. ESRI Press.

Magazines:

Revista Mappemonde: http://mappemonde.mgm.fr/

Revista Mapping España: www.revistamapping.com

The Cartographic Journal: http://www.cartography

Journal of Geographical Information Science https://link.springer.com/journal/11442

Geofocus-Revista Internacional de Ciencia y Tecnología de la Información Geográfica http://www.geofocus.org/index.php/geofocus

Journal of Geographical Systems. http://link.springer.com/journal/10109

Other Websites related to cartography and information.

- List of *GIS in Spanish:

  http://listserv.rediris.es/archives/sig.html

- Cartographic resource blogs

  http://www.elagrimensor.com.ar/

  http://www.neogeoweb.com/

  http://alpoma.net/carto/

  http://www.nosolosig.com/

- Geoportales:

  At European level: http://inspire.ec.europa.eu/

  On a Spanish scale: http://www.idee.es/

  At the scale of Catalonia: http://www.geoportal-idec.net/geoportal/cat/index.jsp

- ESRI

  http//www,esri.es

- Cartographic Geologic Institute of Catalonia

  http://www.icgc.cat/

- National Geographic Institute

  http://www.mfom.es/ign/

- INE – National Institute of Statistics

  www.ine.es

- Statistical Institute of Catalonia

  www.idescat.es

- Eurostat

  http://ec.europa.eu/eurostat/data/database

- Cartography of the Nature Data Bank:

http://www.magrama.gob.es/es/biodiversidad/servicios/banco-datosnaturaleza/informacion-disponible/rednatura_2000_lic_descargas.aspx

- Eurostat Geodata

http://ec.europa.eu/eurostat/web/gisco/geodata/referencedata/administrative-units-statistical-units

- European Soil Portal.

http://eusoils.jrc.ec.europa.eu/library/ESDAC/Index.html

- Geoportal of the Ministry of Agriculture, Food and the Environment

http://sig.mapama.es/geoportal/visor.html

- Web that facilitates geographic coordinates worldwide

http://www.tageo.com/index.htm

- Cartogram map worldwide

http://www.worldmapper.org/