28317 - Geographical information systems

Información del Plan Docente

Academic Year	2017/18
Faculty / School	103 - Facultad de Filosofía y Letras
Degree	419 - Degree in Geography and Land Management
ECTS	9.0
Year	2
Semester	Annual
Subject Type	Compulsory
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The learning and teaching activities developed in this course are designed and programmed to promote the attainment of its objectives . They encompass a wide range of activities such as interactive lessons, practical exercises, individual or group activities, field work and private study , arranged in a logical sequence related to the creation, organization , analysis and use of geographic information . To acquire the skills of the subject, a high level of student participation will be required from all students throughout the course. Extensive material will be available *via* the Moodle site of the course. This offers a variety of resources including a repository of the lecture notes used in class, a course syllabus as well as

other forms of course-specific materials, including a discussion forum.

5.2.Learning tasks

-Lecture sessions : 50 hours

-Interactive, individual or group activities *:* 40 hours

-Field work: 2 hours

-Directed activities: 50 horas

-Private study: 80 hours

-Assessment: 5 hours

5.3.Syllabus

Thematic Area I: Introduction. Data models. Data organization and management

0.Introduction : Teaching and learning " geographical information systems " in the degree of " geography and regional planning "
1. Context , components , definition and applications of geographical information systems
2. The representation of geographical space in the GIS Data Models

3. Obtaining and organizing information . Creation and maintenance of geodatabases

Thematic Area II: GIS Functions for spatial analysis and visualization of geodata

4. GIS and geographical analysis : basic concepts
5. Introduction to the analysis of vector data
6. Modeling and basic raster data analysis
7. Visualizing geodata in GIS

5.4.Course planning and calendar

The course is divided into 2 main thematic blocks. The first block includes the followig themes: 0, 1, 2, and 3; it runs during the first 4 months of the term (September-January). The second thematic block includes the themes 4, 5, 6 and 7; it runs during the following four months (February-May).

For further details concernig the timetable, classroom and other information of the course please refer to the

"Facultad de Filosofía y Letras" web site (http://fyl.unizar.es/)

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Month	Written examinations	Activities	Month	Written examinations	Activities
Sp		Development of theoretical and practical activities of the topics 0 to 3	**Fb**		First week of February : Deadline for the formation of groups of final work practices. Field work at the IGEAR Development of theoretical and practical activities of the topics 4 to 7 . Preparation and monitoring practices final work
Oc			**Mr**	Continuous assessment: second test of practical activities	
Nv			**Ap**		
Dc	Continuous assessment: first test of practical activities		**My**	Continuous assessment: third test of practical activities Continuous assessment. Second partial test (themes 4-7)	
Jn	Continuous assessment. First partial test (themes 0-3)				

5.5.Bibliography and recommended resources

1. Basics Texts

-Bernhardsen, T. (2002): *Geographic Information Systems. An Introduction,* Jonh Wiley & Sons, Nueva York. (428 páginas)

-Bosque, J. (1992): *Sistemas de información geográfica,* Rialp, col.: *Monografías y tratados GER,* Madrid.

-Escolano, S. (2015): *Sistemas de información geográfica. Una introducción para estudiantes de Geografía,* Universidad de Zaragoza, colección "Textos Docentes", Zaragoza (255 páginas).

-Gutiérrez, J., y Gould, M. (1994): *Sistemas de información geográfica,* Síntesis, Madrid. (256 páginas).

-Longley, P. A; Goodchild, M. F.; Maguire, D.J. y Rhind D. W. (2001): *Goegraphic Information Systems and Science,* John Wiley & Sons, Inc, Chichester. (453 páginas) (reedición: 2010).

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- Olaya, V . (2012, v1.0): *Sistemas de información geográfica* , (tomo I. 476 páginas, tomo 2: 435 página; disponibles *on line* en formato pdf: http://www.bubok.es/libros/191920/Sistemas-de-Informacion-Geografica

-Smith, J. M. de, Longley, P. y Goodchild, M (2013). *Geospatial Analysis. A comprehensive Guide to Principles, Techniques and Software Tools* , 4ª edición; disponible on line en format .pdf y de página web: http://www.spatialanalysisonline.com /

2. Complementary text

-Bonham-Carter, G. (1994): *Geographic Information systems for Geoscientists: Modelling with GIS,* Pergamon, Londres.

-Bosque, J. y Moreno, A (Eds), (2004): *Sistemas de información geográfica y localización optima de instalaciones y equipamientos ,* Ra-ma, Madrid.

-Bosque, J., Escobar, García, y Salado (1994): *Sistemas de Información geográfica. Prácticas con PC ARC/INFO e IDRISI,* Ra-ma, Madrid.

-Buzai, G. y Baxendale, C. (2010). Análisis socioespacial con sistemas de Información Geográfica. Tomo I: perspectiva científica. Temática de bases ráster, Lugar Editorial, buenos Aires.

-Calvo, M. (1993): *Sistemas de Información Geográfica Digitales. Sistemas Geomáticos,* IVAP, Oñati.

-Cebrián, J.A. (1992): *Información geográfica y sistemas de información geográfica (SIG),* Serv. Public. Univ. de Cantabria, Santander.

-Chrisman, N. (2002): *Exploring Geographic information systems,* Jonh Wiley & Sons, Nueva York.

-Comas, D., y Ruiz, E. (1993): *Fundamentos de los sistemas de información geográfica,* Ariel, *Ariel Geografía,* Barcelona Chrisman, N. (2002): *Exploring Geographic information systems,* Jonh Wiley & Sons, Nueva York.

-DeMers, M. N. (1999): *Fundamentals of Geographic Information Systems,* Jonh Wiley & Sons, Nueva York.

-Felicísimo, A.M. (1994): *Modelos digitales del terreno. Introducción y aplicaciones en las ciencias ambientales,* Pentalfa, Oviedo. Se puede obtener en: http://www.etsimo.uniovi.es/~feli/TextosP.html

-Fuenzalida, M., Gustavo D. Buzai, Antonio Moreno-Jiménez, y A. García de León (ed.) (2015). *Geografía, geotecnología Y análisis espacial: Tendencias, Métodos Y Aplicaciones* . Santiago (Chile): Tirángulo. Se puede obtener en: http://www.uahurtado.cl/pdf//Fuenzalida_et_al._2015_Geografa_Geotecnologa_y_Anlisis_Espacial.pdf

-Gómez, M. y Barredo, J. I. (2005): *Sistemas de información geográfica y evaluación multicreterio en la ordenación del territorio* , Ra-ma, Madrid (2ª edición).

-Hearnshaw, H., y Unwin, D. (1994): *Visualization in Geographical Information Systems,* Jonh Wiley, Londres.

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-Heywood, I., y Cornelius, S. y Carver, S. (2002): *An introduction to geographical information systems ,* Prentice Hall, Harlow.

-Kraak, M. y Brown, A. (eds) (2001): *Web Cartography. Developments and prospect,* Taylor & Francis, Londres.

-Lo, C. P. and A. K. W. Yeung (2007): *Concepts and Techniques of Geographic Information Systems* , Saddle River, NJ, Prentice Hall.

-Longley, P., Smitth, M. y Goodchild, M. (20007): *Geospatial Analysis, A Comprehensive Guide to Principles, Techniques and Software Tools* , Matador, Leicester,

-MacEachren, A.M., y Fraser, D.R. (Ed.), (1994): *Visualization in Modern Cartography,* Pergamon.

-Maguire, D., Batty, M. y Goodchild, M. (2005): *GIS, Spatial Analysis and Modeling* , ESRI Press, Redlands, CA.

-Mancebo Quintan, S.; Ortega Pérez, E.; Valentin Criado, A.C.; Martín Ramos, B.; Martín Fernández, L. (2008): *Libro SIG: aprendiendo a manejar los SIG en la gestión ambiental* , Madrid. http://oa.upm.es/1244/

-Martin, D. (1996): *Geographic information systems. Socioeconomic applications* , Roudledge, Londres y Nueva York.

-Mitchell, A. (1999): *The ESRI Guide to GIS Analysis* , ESRI Pres, Redlands, CA.

-Moldes, F.J. (1995): *Tecnologías de los Sistemas de Información Geográfica,* Ra-ma, Madrid.

-Moreno, A. (ed.) (2005): *Sistemas y análisis de la información geográfica. Manual de autoaprendizaje con ArcGis,* Ra-ma, Madrid.

-Moreno, A., Buzai, G. D. Fuenzalida, M. Colsa, A. (2012): *Sistemas de información geográfica. Aplicaciones en diágnosticos territoriales y decisones geoambientales* , Ra-ma, Madrid

-Peña, J. (2006): *Sistemas de información geográfica aplicados a la gestión de territorio. Entrada, manejo, análisis y salida de datos espaciales. Teoría general y práctica para ESRI ArcGIS 9,* Departamento de Ecología, Universidad de Alicante, Alicante.

-Pickles, J. (Ed.), (1995): *Ground Truth. The Social Implications of Geographic Information Systems,* The Guilford Press, Nueva York.

-Santos, J. M. (2008): *Los sistemas de información geográfica vectoriales: el funcionamiento de ArcGis* , Cuadernos de prácticas, UNED, Madrid.

-Spence, R. (2001): *Information Visualization* , ACM Pres, Addison-Wesley , Pearson Education Limited, Harlow.

-Zeiler, M. (1999): *Modeling Our World. The ESRI Guide to Geodatabase Desing,* ESRI Press, Redland.

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3. Diccionaries and y Glosaries

-GIS Glossary : http://wiki.gis.com/wiki/index.php/GIS_Glossary

-González, R. 1994. *Diccionario de términos SIG. Madrid: Instituto de Economía y Geografía,* (IEG), CSIC.

-GIS Dictionary (ESRI): http://support.esri.com/en/knowledgebase/Gisdictionary/browse

-GISWEB (Universidad de Alcalá de Henares, the University of Melbourne): http://www.geogra.uah.es/gisweb/

-National Center for Geographic Information Analysis (NCGIA): http://www.ncgia.ucsb.edu

4. Scientific Journals

-*GEOFocus* **:** http://geofocus.rediris.es/

-*Cartography and Geographic Information Systems* . Journal of the American Congress on Surveying and Mapping

-*GEO Europe. (antes GIS Europe).* The geographic tecnology magazine for the British Isles, mainland Europe, the Middle East and Africa: (http://www.geoplace.com).

-*GEO Informatics.* Magazine for GEO-IT Professionals, GEO-IT, Holanda: (http://www.geoinformatics.com)

-GeoSpatialSolutions: (http://www.geospatial-online.com)

-*GIS World* . GIS World Inc, Fort Collins, US

-*International Journal of Geographic Information Sciences,* Taylor & Francis, Londres

-*Mapping* . Revista de Cartografía, Sistemas de Información Geográfica, Teledetección y Medio Ambiente. Cartosig Editorial, S.L. Madrid.

5. Conference Proceedings

-*Proceedings of "Conferencia Iberoamericana de Sistemas de Información Geográfica" (COFIBSIG):* http://www.gesig-proeg.com.ar/link-confibsig.htm

-*Proceedings of Working Group on "Geographical Information Tecnologies" (Asociación de Geógrafos Españoles" -AGE)*

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: http://age.ieg.csic.es/metodos/

6. Internet Data Servers

-Confederación hidrográfica del Ebro . SITEbro : Ebro ValleyTerritorial Information System http://iber.chebro.es/sitebro/sitebro.aspx

-Gobierno de Aragón. Instituto geográfico de Aragón (IGEAR). Geographical information and documentation (data, maps and geographical data) of Aragón: http://idearagon.aragon.es

-Instituto Geográfico Nacional. SIGNA: National Geographical Information system of Sapain: http://signa.ign.es/signa/

7. GIS software

There are many sotware that can manage geographical information : some have a few functions for recording information and develop simple thematic maps ; at the other it was software that properly can be called GIS, which have a lot of functions analyze, structure and visualize geodata .

- ArcGIS v.xx : http://www.esri.com/

Otros programas SIG gratuitos

-Crime Stats® III . (A Spatial Statistical Program for the Analysis of Crime Incident Location) : http://www.icpsr.umich.edu/CrimeStat/

-Diva GIS . : http://www.diva-gis.org/

-Grass GIS . GRASS (Geographic Resources Analysis Support System): http://grass.osgeo.org/

- gvSIG . Sistema de información geográfica desarrollado por la "Asociación para la promoción de la geomática libre y el desarrollo de gvSIG". Es un programa libre, muy extendido por su gran capacidad para el análisis y visualización de información geográfica: http://www.gvsig.org/web/

-Quantum GIS . : http://qgis.org/

8. Otther online resourcest

Internet has become an indispensable tool for disseminating geodata and and geographical knowledge . Any search with the term " geographical information systems " (GIS , SIG) , or the word " mapping " (cartography) , produces numerous , sometimes excessive , references. Examples are listedbelow but , by the nature of the medium , it is advisable to

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periodically scan the network
In addition to the best-known general-purpose search engines , the following are of interest to query on geographical information.

http://www.metacrawler.com

http://www.geoplace.com

http://www.gisdatadepot.com