Tècniques de Recerca Ambiental 2014/2015

Code: 43066
ECTS Credits: 9

Degree	Type	Year	Semester
4313784 Estudis Interdisciplinaris en Sostenibilitat Ambiental, Econòmica i Social	OT	0	2

Contact

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Use of languages

Principal working language: anglès (eng)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Teachers

María Antonia Casellas Puigdemasa

Prerequisites

No prior knowledge is required.

Objectives and Contextualisation

PART A (Dra. Antonia Casellas)

In these 6 sessions students engage in the techniques of academic writing. We will specifically work on academic practice of summary, critique, and synthesis. Topics covered include discussion of Critical/Academic Writing, Papers Structure, Abstracts, Introductions/Conclusions, Evidence, Citation Style, and Plagiarism, Academic Sources, and Library Resources. We will also address strategies for presenting information.

PART B (Dr. Pere Serra)

The main aim of this introductory course is to present the basic concepts and spatial analysis tools provided by the Geographic Information Systems (GIS) derived from the needs in socio-environmental planning and management. Our general goal is that each student develops skills to interpret and use digital spatial data and set the grounds for further (self-) training in GIScience. The specific objectives are:

- Know how to georeference cartographic data for incorporation into a GIS and to identify the criteria of acceptable quality in this process. This goal will be achieved in several cases applied (different map projections, scales, etc.).
- A starting knowledge of data sources and formats useful for geographical studies of all kinds, given special attention to the available standards. The theoretical discussion will be dressed with a series of examples both from the conceptual point of view (uneven geographical distribution of data points, zonal data, etc. in various sizes and backgrounds, with special attention provided through the Internet) and thematic (demographics, weather, etc.). In this context, expanded knowledge about the meaning, interest and use of metadata standards on spatial data infrastructures and on remote sensing.
- Practice of digitizing and vector topological structure as a basic source of incorporating data into a GIS. This goal will be achieved in many cases applied (different map projections, scales, etc.) and complete reworking of the classic materials in operations such as grouping criteria for thematic parks, etc.

- Introduce the knowledge of basic GIS operations such as mosaic, clipping, changes in spatial resolution and map projection and reference systems (ED50 to ETRS89, for example), conversion raster / vector, etc.
- Present and extend the GIS analysis tools knowledge in the context of real-world applications shown on this course, including spatial dynamics with remote sensing, both urban growths as forest fires, etc.

Skills

- Analitzar el funcionament del planeta a escala global per comprendre i interpretar els canvis ambientals a escala global i local.
- Analyse, summarise, organise and plan projects related to the environmental improvement of product, processes and services
- Aplicar la metodologia de recerca, les tècniques i els recursos específics per a investigar i produir resultats innovadors en l'àmbit dels estudis ambientals.
- Buscar informació en la literatura científica fent servir els canals apropiats i integrar aquesta informació per plantejar projectes de recerca en ciències ambientals.
- Comunicar oralment i per escrit en anglès
- Continue the learning process, to a large extent autonomously
- Que els estudiants sàpiguen aplicar els coneixements adquirits i la seva capacitat de resolució de problemes en entorns nous o poc coneguts dins de contextos més amplis (o multidisciplinaris) relacionats amb la seva àrea d'estudi.
- Tenir coneixements que aportin la base o l'oportunitat de ser originals en el desenvolupament o l'aplicació d'idees, sovint en un context de recerca

Learning outcomes

1. Aplicar la metodologia de recerca, les tècniques i els recursos específics per a investigar i produir resultats innovadors en l'àmbit dels estudis ambientals.
2. Buscar informació en la literatura científica fent servir els canals apropiats i integrar aquesta informació per plantejar projectes de recerca en ciències ambientals.
3. Comunicar oralment i per escrit en anglès
4. Continue the learning process, to a large extent autonomously
5. Interpretar els processos i els problemes ambientals aplicant els coneixements teòrics, metodològics i instrumentals.
6. Intervenir i actuar en qüestions ambientals de diversa índole reforçant el component aplicat i experimental.
7. Que els estudiants sàpiguen aplicar els coneixements adquirits i la seva capacitat de resolució de problemes en entorns nous o poc coneguts dins de contextos més amplis (o multidisciplinaris) relacionats amb la seva àrea d'estudi.
8. Tenir coneixements que aportin la base o l'oportunitat de ser originals en el desenvolupament o l'aplicació d'idees, sovint en un context de recerca

Content

PART A (Dra. Antònia Casellas)
The course structure will be:

1) Readings.

2) Short Writings.

3) Short Essays.
PART B (Dr. Pere Serra)

The diverse lessons to develop in the course are:

1/ Formats, standards and data sources

2/ Georeferencing cartography

3/ Digitizing and topological structure

4/ Basic operations in GIS

5/ Generation and use of digital elevation models and spatial interpolation

6/ Analysis operation in GIS

7/ Application of case studies

8/ Internet and geoportals

Methodology

PART A (Dra. Antònia Casellas)

The assignment requirements of the sessions include:

1) Readings: We will do readings of journal articles selected by professor and students. The readings will be discussed it in class.

2) Short Writings: Throughout the classes students will complete several short writing assignments in class. These pieces will be exercises in employing concepts learned in class/reading.

3) Short Essays: Students will write four short essays: (a) The first essay is a Summary-Critique Essay: Students find a lengthy scholarly article form their fields of study and write a summary and critique of that article; (b) The second essay is a Synthesis Essay: Students write a literature review for a topic they are working on in their fields of study; (c) The third essay is a Exploratory Essay, in which students define and explain a theoretical concept in their fields of study; and (d) the fourth essay is a Design Research Essay in which students pose a theoretical problem in the scholarly literature from their fields of study or identify a research gap and explore methodological techniques and the use of data to develop the research.

PART B (Dr. Pere Serra)

The course content will be developed through the following activities:

- Oral expositions from the teacher.

- Reading book chapters or articles (individual activity of students, complementary to classroom work).

- Practical classes guided by the teacher.

- Work done independently by students based on teacher proposals.

- Oral expositions from the students.

Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Practical exercises guided by the teacher	21	0.84	1, 5, 6, 7, 4, 8
Theoretical explanation and readings	9	0.36	1, 5, 6, 7, 4, 8

Type: Supervised			
Monitoring of oral presentation	14	0.56	1, 5, 6, 7, 4, 8
Monitoring of practices	26	1.04	3
Type: Autonomous			
Practical exercises conducted independently by students	65	2.6	2
Reading theoretical literature	90	3.6	3

Evaluation

PART A (Dra. Antòna Casellas)

Final Grade of the 6 Sessions:

Attendance & Participation…… 20%

Four Essay Assignments ……..……. 60%

Class Presentation……20%

The sessions will represent 33% of the final grade of the course.

Note: students with limited English skills will be able to do their essays in Catalan or Spanish.

PART B (Dr. Pere Serra)

Final exam	40%
Oral presentation	30%
Practical exercises	30%

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Final exam	40%	0	0	2, 3, 7
Oral presentation	30%	0	0	1, 2, 3, 7
Practical exercises	30%	0	0	1, 2, 3, 7

Bibliography

- Bonham-Carter, G.F. (1994) Geographic information systems for geoscientists modelling with GIS, Pergamon. Kidlington. 398 p.
- Burrough, P.A., McDonnel, R.A. (1998) Principles of Geographical Information Systems (2nd Edition). Oxford University Press.

- Malczewski, J. (1999) GIS and Multicriteria Decision Analysis. John Wiley & Sons. Inc., New York, 392 p.
- Laurini, R., Tompson, D. (1992) Fundamentals of Spatial Information Systems Academic Press. Londres. 680 p.
- Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W. (2005), Geographical Information Systems and Science. Wiley.
- Maguire, D.J., M.F. Goodchild, Rhind, D.W. (eds.) (1991) Geographical Information Systems. Principles and Applications. 2 Vol. Longman Scienti Technical. Essex. 649+447 p.

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