

Geographical Crime Analysis

Code: 103953
ECTS Credits: 6

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Degree	Type	Year
Criminology	OB	3

Contact

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Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

There are no prerequisites related to this subject, although it will be useful to have computer and statistics skills.

Objectives and Contextualisation

Introduction

The geographic analysis of crime using Geographic Information Systems (GIS) is a well-developed field with a large experience especially in the Anglo-Saxon world and it is currently being highly implemented in Spain. The French and British schools of criminological cartography and the ecological school in Chicago led the pioneering contributions regarding the importance of space in the management of crime. They focused on the description of the spatial differences of urban violence and crime. Nowadays, we have a design of models and techniques that would have been unthinkable at the beginning of the twentieth century. In this context, GIS have become the best tool to analyze and model crime. With this tool, we can carry out a spatial analysis of the place where offenders live and see the places where crimes take place by using methods such as hotspots. We can also analyze the risk of crime in one area, as well as the distribution of the sense of insecurity or the resources to prevent it. The main reason why GIS are used is for their ability to diagnose, not only to plan, but also to acknowledge the causes and why. In this sense, the combination of different spatial, socioeconomic and environmental variables will provide arguments and will be used to support the decision-making process in order to prevent crime and act accordingly.

General Aims

With GIS we can make explicit what is implicit and we can see how crime is distributed and why it is distributed in this way. This subject is an introduction to the spatial analysis of crime. The aim is to provide students with both the theoretical and practical knowledge to use GIS's basic tools. The interest is not to teach how to use GIS software, but to give tools to know what kind of problems GIS can solve.

The main aim is not to train students in some specific software, but to understand basic aspects regarding the type of geographic information and how to deal with and analyze the data compiled. At the end of this course, students must be able to know how to apply the knowledge skills achieved through the consolidation of both the theoretical and practical aspects developed according to the needs shown in other geographical subjects. So, we give them tools to understand what we are doing when we are using GIS, and why they are used.

Specific aims

With this objective, we are planning a double aim associated with the theoretical and practical content of the subject. On the one hand, the conceptual context around GIS and on the other, the total number of abilities that the use of GIS requires. At a general level, students need to know and understand what GIS are, why they are used, how they are used and when they need to be used.

In the conceptual level, the following objectives are developed:

- Providing the basic knowledge to understand and use cartographic representation in the context of criminology.
- Knowing the previous spatial representation of crime and at the same time, understanding the nature of Geographic Information Systems (definition and characteristics).
- Knowing and understanding how the geographic information is introduced, structured and stored, as well as the main functions of GIS manipulation and analysis carried out to solve different questions.
- Knowing and understanding the two data models used to represent reality (vector and raster data models) and the sources of information related with crime.
- Knowing how to apply and interpret the results of the application of spatial analysis tools and assess the possibility to spread them in terms of stigmatization. Publishing a hotspot map would be a good example of this.

In the second case, by gaining the abilities to use GIS, we are not trying to show students the technique as such, but to make them aware of what can be done, how it can be done and where they can apply it. The objectives can be detailed in the following way:

- Understanding and knowing how to use GIS as a tool to obtain answers to certain types of questions.
- Knowing what types of operations are appropriate in each case to solve specific needs.
- Gaining practical experience in solving some specific problems of geographic and land discipline.

Competences

- Ability to analyse and summarise.
- Accessing and interpreting sources of crime data.
- Applying the quantitative and qualitative data collection techniques in the criminological field.
- Clearly explaining and arguing a carried out analysis about a conflict or crime problem and its responses in front of specialised and non-specialised audiences.
- Designing a criminological research and identifying the appropriate methodological strategy to the proposed goals.
- Using research methods in social sciences in order to diagnose criminality problems.
- Working autonomously.
- Working in teams and networking.

Learning Outcomes

1. Ability to analyse and summarise.
2. Analysing criminal and control data through tools of geographical information system (GIS).
3. Applying the quantitative and qualitative data collection techniques in the criminological field.
4. Choosing the appropriate research methodology in criminological works.
5. Diagnosing a criminal process through the scientific method.
6. Interpreting in a scientific way statistical data from the criminological field.
7. Transmitting in a reasoned manner the results of a criminological research.
8. Working autonomously.
9. Working in teams and networking.

Content

1. Environmental Criminology and GIS

- Background: the Chicago school. How Geography can explain the spatial distribution of crime
- GIS: what are they? What is their history? GIS contributions to the spatial distribution of crime
- Cartography and crime maps

2. Geographical information for the spatial analysis of crime

- The thematic, spatial and temporary components of geographic information
- Checking the place and condition. First level of GIS use

3. Georeferencing crime

- Absolute and relative georeferencing
- The value of the georeferenced information. The spatial location of crimes and the relationship with other spatial variables

4. Data models

- Raster model
- Vector model
- Data sources for spatial representation of crime
- Analysis of the design and content of crime WMS

5. Spatial analysis

- Overlay of layers
- Buffer and distance maps
- Density maps: Hotspot

6. The importance of designing the map as a tool to support decision making

- Cartographic symbolization
- Elements in the design of a map

Schedule, sequencing the syllabus and evaluation activities, will be uploaded to the virtual campus at the beginning of the course.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lectures	19.5	0.78	2, 3, 7
Seminars	19.5	0.78	2, 3, 5, 4, 6, 7
Type: Autonomous			
Individual work, using software and readings.	106	4.24	2, 3, 5, 6, 1, 9

Guided activities. These activities take place in class and consist of:

- Lectures to explain the theoretical content of the subject.
- Seminars: once all the theoretical concepts of the subject are known, they are applied through a guided practical task of a real case. The student will have access to the tutorial of this activity.

Autonomous activities. These activities complete the ones mentioned before and their main objective is for the student to work the contents of the subject individually or in a group. These activities consist of:

- Sequence of practical tasks individually and/or small groups. The main aim of these practical tasks is for the student to apply autonomously the knowledge learned in the seminar in a new similar practical case.
- Reading an article or a chapter of a book. One or two questions of the exam will evaluate the reading and comprehension of this article.

To follow the course students will be provided with a specific GIS software: ArcGis (commercial), QGIS (Open Source for Students) or Qgis (Open Source).

In this subject it is essential to bring a pen drive for all sessions with at least 2 GB of capacity.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Exam	30%	5	0.2	2, 3, 5, 4, 1, 7, 8
Individual work of Data analysis in class	30%	0	0	2, 3, 6, 1, 8
Practical exercises	40%	0	0	2, 3, 5, 4, 6, 7, 8, 9

Items of evaluation

- 2 exams with two parts: theory and practical (30%)
- Individual work of Data analysis in class (30%)
- Practical exercises (40%)

Requirements for being assessed

- Doing 3 exercises. Delivery is mandatory and will not be accepted out of time. Students will only be admitted to the exam once they have delivered the required exercises.
- Doing the 2 exams (one in middle-term and the other in the end).
- The evaluation of learning is based on the results of practical assignments completed independently. At least 80% of these assignments must be submitted within the deadline set by the professor. Students will not be allowed to sit for the exam if they have not submitted the required assignments by that time, and the final grade will be "Not Gradable." Attendance will be monitored for both theoretical and practical classes. Students will be assessed as long as they have completed a set of activities whose weight is equivalent to a minimum of 2/3 of the total grade of the subject. If the value of the activities carried out does not reach this threshold, the teacher of the subject can consider the student as not evaluable. Additionally, students who pass the course will receive a 5% bonus on their final grade if they have met the minimum attendance requirement.

Requirements to pass the course

The theoretical-practical exams will consist of a grade for the theoretical part and another for the practical part, and they will be evaluated separately. The averages between the two theoretical or practical tests of the exam are calculated starting from a grade of 4, and the exams will only be passed if the average of the grades is at least 5. However, the theoretical and practical parts of the subject must be passed separately with a minimum average grade of 5 in order for them to count towards the final average.

As an example, if a student gets a 6 and a 4 in the theoretical part of the two exams and a 5 and a 4 in the practical part, the student will not have achieved the minimum required concepts of the subject, since the average between the two parts is 5 and 4.5. Both parts must be passed with a minimum grade of 5. In this case, the student may retake one or both parts.

If the subject is not passed, the grade recorded in the transcript will be the result of the evaluation.

Fraudulent conducts

Students that cheat or attempt to cheat in the exam will get a 0, losing the right to a second chance. Plagiarism will conduct to a fail of the essay and, in case of recidivism the student will receive a fail mark.

Punctuality

Classes start on time. Late arrival or leaving early is not permitted before the class finishes, except justified cause.

Other aspects

- When 30% of the evaluation activities have been presented, the student is inside of evaluation process.
- The degree requires attending a minimum of 80% to pass the course. Only absences due to illness or similar reasons may be justifiable.

Unique evaluation

- It will consist of three multiple-choice tests. To pass the subject you must pass each part.
- First part (30%). Theoretical exam that will contain 50 test-type questions on the basic concepts of the subject and 2 questions on the mandatory reading Galdon, G., Pybus, M. (2011). *Crisis económica y gestión de la inseguridad ciudadana: los mapas de delincuencia*. *Revista catalana de seguridad pública*.
- Second part (30%). Practical exercise in which students will have to solve: queries, digitizing elements, georeferencing, symbolization and spatial analysis.
- Third part (40%). A work that contains the methodology and the results of: data download, data treatment, queries, symbolization and map composition.

Resit

- It will only be possible to reassess if the activity has been submitted. The maximum mark in case of resit is 5.
- Failed exercises may only be resit when the average mark does not reach 5.
- In the unique evaluation it will be possible to reassess: the theoretical exam, the individual work of Data analysis and the work. The maximum mark in case of resit is 5.

Bibliography

Mandatory readings

Bottoms, A. (2012). Developing socio-spatial criminology. In M. Maguire, R. Morgan i R. Reiner, R. (eds.), *The Oxford Handbook of Criminology* (pp. 450-489). Oxford University Press.

Galdon, G. & Pybus, M. (2011). Crisis económica y gestión de la inseguridad ciudadana: los mapas de delincuencia. *Revista Catalana de Seguretat Pública*, 24, 79-105.

Olaya, V. (2011). Parte 2. Datos. In V. Olaya (ed.), *Sistemas de información geográfica*. España.

Other references:

General references on GIS

Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2005). *Geographic information systems and science*. John Wiley & Sons.

Nunes, J. (2012). *Diccionari terminològic de sistemes d'Informació Geogràfica*. Institut Cartogràfic de Catalunya.

Olaya, V. (Ed.), *Sistemas de Información Geográfica*. España. ISBN: 9781716777660

GIS applied to crime analysis

Boba, R. (2001). *Introductory guide to crime analysis and mapping*. (Report 97-CK-WXK-004). Community Oriented Policing Services. <https://portal.cops.usdoj.gov/resourcecenter/ric/Publications/cops-w0273-pub.pdf>

Chainey, S., & Ratcliffe, J. (2013). *GIS and crime mapping*. John Wiley & Sons.

Harries, K. D. (1999). *Mapping crime: Principles and practice*. Diane Publishing Company.

San-Juan, C., & Vozmediano, L. (2021). *Guía de prevención del delito: seguridad, diseño urbano, participación ciudadana y acción policial*. J M Bosch.

San-Juan, C. & Vozmediano, L. (2011). *Criminología Ambiental: Ecología del delito y de la seguridad*. Editorial UOC.

Weisburd, D., Bruinsma, G. J., & Bernasco, W. (2009). Units of analysis in geographic criminology: Historical development, critical issues, and open questions. In D. Weisburd, G. J. Bruinsma & W. Bernasco (Eds.), *Putting crime in its place* (pp. 3-31). Springer.

Weisburd, D., Groff, E. R., & Yang, S. M. (2012). *The criminology of place: Street segments and our understanding of the crime problem*. Oxford University Press.

Software

To follow the course students will be provided with a specific GIS software: ArcGis (commercial), , MiraMon (Open Source for students) or Qgis (open source).

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(SEM30) Seminaris (30 estudiants per grup)	11	Catalan	second semester	morning-mixed
(SEM30) Seminaris (30 estudiants per grup)	12	Catalan	second semester	morning-mixed

(TE) Theory	1	Catalan	second semester	morning-mixed
(TE) Theory	2	Catalan	second semester	morning-mixed