DEGREE CURRICULUM

QUANTITATIVE TECHNIQUES AND METHODS

Coordination: LASALA FORTEA, JOSÉ

Academic year 2023-24

QUANTITATIVE TECHNIQUES AND METHODS 2023-24

Subject's general information

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<tr><td>Subject name</td><td>QUANTITATIVE TECHNIQUES AND METHODS</td></tr>
<tr><td>Code</td><td>101158</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>COMMON/CORE</td><td>Attendance-based</td></tr>
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<tr><td>Course number of credits (ECTS)</td><td>6</td></tr>
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<tr><th>Activity type</th><th>PRALAB</th><th>PRAULA</th><th>TEORIA</th></tr>
<tr><td>Number of credits</td><td>1</td><td>1</td><td>4</td></tr>
<tr><td>Number of groups</td><td>1</td><td>1</td><td>1</td></tr>
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<tr><td>Coordination</td><td>LASALA FORTEA, JOSÉ</td></tr>
<tr><td>Department</td><td>GEOGRAPHY, HISTORY AND HISTORY OF ART</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>60 hours of face-to-face (in-class or virtual) instruction and 90 hours of independent student work.</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

NOTE: The language of instruction for the course can be in Spanish if there are exchange students who require that option. The necessary measures will be taken to ensure that exchange students can fully participate in the learning process and understand the course content.</td></tr>
<tr><td>Distribution of credits</td><td>BLOCK 1: 0.3 ECTS
BLOCK 2: 1.4 ECTS
BLOCK 3: 3.5 ECTS
BLOCK 4: 0.8 ECTS</td></tr>
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QUANTITATIVE TECHNIQUES AND METHODS 2023-24

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
LASALA FORTEA, JOSÉ	jose.lasala@udl.cat	6	Hours to be arranged in class or via email. Availability from Monday to Friday - Office 3.16 Faculty of Humanities. Contact email: jose.lasala@udl.cat

Subject's extra information

View the following sections.

It is essential to attend class every day in order to successfully pass the subject and understand the concepts.

It is mandatory to bring a scientific calculator to class (programming capability is not required). Recommended model: Casio FX series or similar.

Learning objectives

OBJECTIVES:

O1. Understand the applicability of quantitative methods in social sciences, their strengths, and their limitations.

O2. Understand and be able to write in the appropriate mathematical language for quantitative methodologies.

O3. Understand the meaning of different types of variables and frequencies.

O4. Understand the meaning and calculation of descriptive statistics.

O5. Understand the meaning and calculation of inferential statistics.

O6. Understand the meaning and calculation of spatial statistics.

O7. Master statistical calculation software and databases such as Excel and SPSS.

O8. Understand and develop analytical skills for interpreting and analyzing results.

OUTCOMES:

The learning outcomes should be as follows:

R.1 - Mastery of basic tools of descriptive statistics.

R.2 - Mastery of basic tools of inferential statistics.

R.3 - Mastery of basic tools of spatial statistics.

R.4 - Ability to conduct research using quantitative methods.

R.5 - Advanced proficiency in Excel. Basic proficiency in SPSS. Proficiency in the spatial statistics toolbox of ArcGIS.

Competences

CB2 Apply their knowledge to their work or vocation in a professional manner and possess the skills that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their

area of study

CB3 Ability to gather and interpret relevant data (normally within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical issues

CB4 To be able to transmit information, ideas, problems and solutions to a specialized and non-specialized public)

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

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

CE2 Acquire the vocabulary and professional tools of the geographer and the planning of the territory

CE5 Acquire the habits of search, analysis, synthesis and exposure of geographic information (writing reports)

CE12 Acquire the skills of quantitative methodologies

CE14 Learn the use of GIS software in its different functions: data entry, editing and management, spatial queries and analysis
CT3 Acquire training in the use of new technologies and information and communication technologies

Ability to apply statistical techniques to the resolution of geographical problems and, in genral proper to the CCSS

Subject contents

The course contents are divided into 4 blocks:

BLOCK	Section	Description
	Quantitative Methods in Social Sciences	
1	1.1	Approach, foundations, and limitations.
	1.2	The language of statistics: Symbols and representation.
	Descriptive Statistics	
	2.1	Continuous and Discrete Variables.
2	2.2	Frequencies and Position.
	2.3	Mean, Median, Variance, and Standard Deviation.
	2.4	Sampling Design.
	Inferential Statistics	
	3.1	Regression and Correlation: Pearson's R and Spearman's Rho.
	3.2	Standardized Scores and Z-scores.
3	3.3	Hypothesis Formulation and Testing: Binomial, Chi-square, and Student's t-tests.
	3.4	Segregation Indices.
	3.5	Linear Regression Models.
	Spatial Statistics	

4	4.1	Pattern Analysis: Clusters and Autocorrelations.
	4.2	Cluster Assignment: Gi-Getis Ord Hot Spot Analysis.

Methodology

The methodological axes of the course will consist of:

- Theory lectures: Mandatory attendance.
- Practical classes for problem-solving: Mandatory attendance.
- Seminars for problem-solving and practical cases (4 Wednesdays during the semester, to be arranged with students based on the difficulty of the blocks): Not mandatory but highly recommended.

Development plan

The development plan for the course is as follows:

BLOCK	Section	Description	Theoretical Classes (hours):	Practical Classes (hours):	Total (hours):
	Quantitative Methods in Social Sciences		***3***	***0***	***3***
1	1.1	Approach, foundations, and limitations.	1	0	1
	1.2	The language of statistics: Symbols and representation.	2	0	2
	Descriptive Statistics		***5***	***9***	***14***
	2.1	Continuous and Discrete Variables.	1	0	1
2	2.2	Frequencies and Position.	1	3	4
	2.3	Mean, Median, Variance, and Standard Deviation.	2	2	4
	2.4	Sampling Design.	1	4	5
	Inferential Statistics		***10***	***25***	***35***
	3.1	Regression and Correlation: Pearson's R and Spearman's Rho.	2	4	6
3	3.2	Standardized Scores and Z-scores.	2	5	7
	3.3	Hypothesis Formulation and Testing: Binomial, Chi-square, and Student's t-tests.	3	8	11
	3.4	Segregation Indices.	1	3	4
	3.5	Linear Regression Models.	2	5	7
	Spatial Statistics		***2***	***6***	***8***
4	4.1	Pattern Analysis: Clusters and Autocorrelations.	1	3	4
	4.2	Cluster Assignment: Gi-Getis Ord Hot Spot Analysis.	1	3	4

TOTAL	**60**

Evaluation

The teaching staff of the course will take necessary measures to ensure access to learning for all students and, if needed, make appropriate modifications to the assessment system, always following the recommendations and guidelines of the Commission for Diversity Support at UdL. It is a mandatory condition to be referred from UdLxTothom.

Two evaluation modalities are offered:

1 - CONTINUOUS EVALUATION:

BLOCK 1 - EXAMINATION:

1.1 Examination - 45%

The examination does have a second recovery exam.

The examination will be conducted according to the schedule set by the Faculty of Arts' examination calendar.

BLOCK 2 - PRACTICALS:

2.1 - Practice 1 - Descriptive Statistics - 10%

2.2 - Practice 2 - Analytical Statistics - 10%

2.3 - Practice 3 - Spatial Statistics - 10%

The practicals do have a second recovery opportunity.

The practicals will be submitted in the activities section of the Virtual Campus.

BLOCK 3 - INDIVIDUAL WORK:

3.1 - Research Paper - 25%

The research paper does not have a second recovery opportunity.

The research paper will be submitted in the activities section of the Virtual Campus.

CONTINUOUS EVALUATION REQUIREMENTS:

A minimum grade of 4 in BLOCK 1 is required for the evaluation of other components of the final grade.

A minimum grade of 4 in BLOCK 2 is required for the evaluation of other components of the final grade.

Attendance is mandatory for continuous evaluation. With attendance below 80% (unjustified), there will be an option for the final exam, following the same criteria as the alternative evaluation.

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2 - ALTERNATIVE EVALUATION:

WRITTEN EXAM - 60%

COMPUTER-BASED EXAM - 40%

Both exams will be conducted according to the schedule set by the Faculty of Arts' examination calendar. The alternative evaluation does have a second recovery opportunity.

ALTERNATIVE EVALUATION REQUIREMENTS:

Students who combine their studies with full-time work have the right to request alternative evaluation within 10 days from the beginning of the semester. This procedure must be carried out through the Faculty of Arts' secretariat. Only students deemed eligible by the secretariat can opt for this modality. For more information, please email academic@lletres.udl.cat or visit the Faculty of Arts' Secretariat.

In case of academic fraud, the regulations for evaluation and grading of teaching in the Bachelor's and Master's degrees at UdL will be applied.

Bibliography

Grupo Chadule: *Iniciación a los métodos estadísticos en Geografía*. Barcelona: Ariel, 1980.

Juan Verdoy, P.: Introducción a la estadística y probabilidad, Valencia: Tilde, 2008

López-Roldan, P.; Fachelli, S. *Metodología de la investigación social cuantitativa.* Universitat Autònoma de Barcelona, 2015.

Martín Guzmán, P. (et al): *Manual de estadística descriptiva*. Navarra: Aranzadi, 2006

Serrano Lara, J. J. *Ejercicios de estadística para geógrafos*, Valenca: Tirant Humanidades, 2020