Coordinating unit: 200 - FME - School of Mathematics and Statistics
Teaching unit: 1004 - UB - (ENG)Universitat de Barcelona
Academic year: 2017
Degree: MASTER'S DEGREE IN STATISTICS AND OPERATIONS RESEARCH (Syllabus 2013). (Teaching unit Optional)
ECTS credits: 5
Teaching languages: Spanish

Teaching staff

Coordinator: MIREIA FERNÁNDEZ ARDÉVOL
Others: Segon quadrimestre:
        MIREIA FERNÁNDEZ ARDÉVOL - A

Prior skills

- A minimal familiarity with the official or public statistics.
- Basic abilities in descriptive and statistical inference.
- Knowledge of statistical sampling and main statistical information sources
- Basic knowledge of macroeconomics, business economics, sociology and demography.

Requirements

In terms of the thematic content, focused on the socio-demographic and economic indicators usually generated by national statistical offices, it is recommended to have a minimum knowledge of the usual statistical information on demographics, social conditions, and macroeconomics related to a country. Also, as the institutional environment is practically reduced to governments that generate official statistics, it is desirable to have a minimal familiarity with the public legal aspects or principles, and with governmental practices.

With regard to instrumental aspects, the optimal monitoring of the course requires a basic knowledge of the standard procedures of descriptive statistics and inferential statistical concepts, which are at the basis of most of the demographic and economic indicators. It is also recommended some practical experience in dealing with current data on individual characteristics and the interpretation of tabulated data or aggregate statistical information (such as composite or synthetic indicators).

Degree competences to which the subject contributes

Specific:
5. CE-1. Ability to design and manage the collection of information and coding, handling, storing and processing it.
6. CE-2. Ability to master the proper terminology in a field that is necessary to apply statistical or operations research models and methods to solve real problems.
7. CE-8. Ability to discuss the validity, scope and relevance of these solutions and be able to present and defend their conclusions.

Transversal:
1. SUSTAINABILITY AND SOCIAL COMMITMENT: Being aware of and understanding the complexity of the economic and social phenomena typical of a welfare society, and being able to relate social welfare to globalisation and sustainability and to use technique, technology, economics and sustainability in a balanced and compatible manner.
3. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.
4. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.

Teaching methodology

The methodology for teaching and learning combines presence-based classes (three hours per week) with guided activities the student must complete. For each unit, there will be one or more lecture sessions followed by readings or complementary (guided) activities.

The Internet will play a role as a support of statistical sources, both for the availability of learning resources and for the way of accessing the published information. In some cases, these activities may be part of the evaluation (see the evaluation system section).

Learning objectives of the subject

Social, economical and demographic indicators of a specific space are very close to official or public statistics as a general framework of legitimisation. In this sense, official statistics was born out of the necessity to provide regulated and harmonized statistical information regarding the demographic, social and economic environments of national realities. Knowledge of the functional mechanisms and coordination of its modes of production along with the diffusion of outcomes are of special interest for statisticians in this context, as well as for users of official statistics who require a measurement of meta-information regarding the quality and limitations of the data they need to use.

On the other hand, the development of official statistics has often posed methodological and organizational challenges toward the application of statistical methods, for which it has been necessary to try out new techniques and specific procedures for a resolution. At the same time, some methodologies born of this process have been subsequently generalized in other fields of quantitative research in the social sciences, such as non-response, small area estimation, statistical matching or statistical disclosure control.

In this context, the course attempts to familiarize the student with the legal and institutional environment of public statistics, the principle processes in the production and dissemination of statistical outcomes and, finally, the sources of demographic, social and economic statistics that are currently available from the state and autonomous regions. Consequently, the course considers separately and sequentially these three fields, with special attention applied to the organizational elements and characteristic methodologies of the statistical agencies in Europe, and focused on the Catalan and the Spanish statistical systems.

More specifically, the goals of the course differentiate between four distinct spheres of learning:

1) Knowledge of the working programs, resources and constraints in which official statistics operates, especially in Catalonia, Spain and Europe.
2) Contextualise the processes of statistical operations design, the development of technical projects and joint meta-information associated.
3) Familiarization with some methods for processing data or in estimating statistical outcomes produced by official statistics.
4) Know how to identify, locate and assess the availability of official statistical information, preferably in the form of indicators in the field of demographics, social conditions of a population and regarding economic structures.
## Study load

<table>
<thead>
<tr>
<th>Description</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Total learning time: 125h</td>
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<tr>
<td>Hours large group:</td>
<td>30h</td>
<td>24.00%</td>
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<tr>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td>Hours small group:</td>
<td>15h</td>
<td>12.00%</td>
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<tr>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td>Self study:</td>
<td>80h</td>
<td>64.00%</td>
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## Content

**Block 1. Institutional and legal environment of official statistics**

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<thead>
<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>2. The Catalan and Spanish statistical systems; Idescat and INE coordination roles. Statistical plans and statistical annual work programs. The European statistical planning.</td>
</tr>
<tr>
<td>3. Protection of personal data and statistical confidentiality. Information and privacy rights: statistical secret and close figures. Methods and criteria regarding statistical disclosure control. The role of regulatory bodies.</td>
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<table>
<thead>
<tr>
<th>Learning time: 41h 40m</th>
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<tbody>
<tr>
<td>Theory classes: 10h</td>
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<tr>
<td>Laboratory classes: 5h</td>
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<tr>
<td>Guided activities: 8h 20m</td>
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<tr>
<td>Self study : 18h 20m</td>
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**Block 2. Processes for the production of statistical information**

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<tr>
<td>6. Methodology of statistical operations: the technical project associated to official activities. Relevant aspects in the design of questionnaires and sampling plans. Methods for gathering information and operational control. Procedures for data editing, imputation and weighting.</td>
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</table>

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<tr>
<td>Theory classes: 10h</td>
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<tr>
<td>Laboratory classes: 5h</td>
</tr>
<tr>
<td>Self study : 26h 40m</td>
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</table>
Two alternative evaluation systems are defined, at the student's choice:

(A) Continuous evaluation, the recommended option. It is the recommended option and consists of three main activities:

1. Team assignment [Weight: 40%]. About selected topics related to Blocks 1 or 2 of the program (lessons 1 to 6). Synthetic and with personal conclusions/evaluation, the tasks consists of a written article and an oral presentation. At the beginning of the course, a list of possible topics will be proposed. The work is delivered and orally presented at mid-course.

2. Individual assignment [Weight: 40%]. Guided comparative analysis of two statistical operations. A synthetic essay that will consist of a written paper and an oral presentation. A process of peer-to-peer correction will complement the task. At the beginning of Block 3, the students will choose the statistical operations. Oral presentations will follow a pre-established schedule. Last week of class will include the peer-to-peer correction.

3. Readings and participation [Weight: 20%]. Lectures to be discussed in class, proactivity, comments on classmates' work. If the total marks do not achieve 5 points (out of 10), the student must take the single evaluation.

(B) Single evaluation. This option is recommended for students unable to regularly attend classes. A written exam to be carried out on the date fixed before enrolment.

Qualification system

Two alternative evaluation systems are defined, at the student's choice:

(A) Continuous evaluation, the recommended option. It is the recommended option and consists of three main activities:

1. Team assignment [Weight: 40%]. About selected topics related to Blocks 1 or 2 of the program (lessons 1 to 6). Synthetic and with personal conclusions/evaluation, the tasks consists of a written article and an oral presentation. At the beginning of the course, a list of possible topics will be proposed. The work is delivered and orally presented at mid-course.

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(B) Single evaluation. This option is recommended for students unable to regularly attend classes. A written exam to be carried out on the date fixed before enrolment.

Regulations for carrying out activities

Continuous evaluation requires the delivery of all the assignments.
Bibliography

Basic:


Complementary:


Others resources:

Legal regulations and recommendations

Ley 23/1998, de 30 de diciembre, de estadística de Cataluña. DOGC núm. 2801 de 8 de enero de 1999

Ley 13/2010, del 21 de mayo, del Plan estadístico de Cataluña 2011-2014. DOGC núm. 5638 de 28 de mayo de 2010

Decreto 165/2014, de 23 de diciembre, por el cual se aprueba el Programa anual de actuación estadística para el
año 2015. DOGC núm. 6779 de 30 de diciembre de 2014

Ley 12/1989, de 9 de mayo, de la Función Estadística Pública. BOE núm. 112 de 11 de mayo de 1989

Real Decreto 1658/2012, de 7 de desembre, por el qual se aprueba el Plan Estadístico Nacional 2013-2016. BOE núm. 295 de 8 de diciembre de 2012

Recomendación de la Comisión Europea, de 25 de mayo de 2005, sobre la independencia y responsabilidad de las autoridades estadísticas nacionales y comunitarias.

Reglamento 223/2009 CE del Parlamento Europeo y del Consejo, de 11 de marzo del 2009, relativo a la estadística europea

Reglamento (UE) 2015/759 del Parlamento Europeo y del Consejo, de 29 de abril de 2015, por el que se modifica el Reglamento (CE) no 223/2009, relativo a la estadística europea


Recomendación de la Comisión, de 23 de junio de 2009, sobre los metadatos de referencia para el Sistema Estadístico Europeo

Reglamento 557/2013 CE, de 17 de junio de 2013, por el que se aplica el Reglamento CE 223/2009 del Parlamento Europeo y del Consejo, relativo a la estadística europea, en lo que respecta al acceso a datos confidenciales con fines científicos


Hyperlink

Institut d'Estadística de Catalunya
http://www.idescat.cat

Instituto Nacional de Estadística
http://www.ine.es

"Índice. Revista de Estadística y Sociedad"
http://www.revistaindice.com

Eurostat (oficina estadística Unió Europea)
http://ec.europa.eu/eurostat/web/main/home
OCDE
http://www.oecd.org/

Divisió Estadística de Nacions Unides
http://unstats.un.org/unsd/default.htm

UNESCO Institute for Statistics
http://www.uis.unesco.org/Pages/default.aspx