



## Teaching Guide

Identifying Data					2020/21
<b>Subject (*)</b>	Statistical Methods and Introduction to Econometrics	<b>Code</b>	611G01019		
<b>Study programme</b>	Grao en Economía				
Descriptors					
Cycle	Period	Year	Type	Credits	
Graduate	2nd four-month period	Second	Obligatory	6	
<b>Language</b>	GalicianEnglish				
<b>Teaching method</b>	Face-to-face				
<b>Prerequisites</b>					
<b>Department</b>	Economía				
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<b>Lecturers</b>	Martinez Filgueira, Xose Manuel Mourelle Espasandin, Estefania	<b>E-mail</b>	xose.martinez@udc.es estefania.mourelle@udc.es		
<b>Web</b>					
<b>General description</b>	This subject constitutes the continuation of the subjects Statistics I and Statistics II, and it is devoted to present the main methodologies to deal with and statistically analyze any type of economic information, both numerical or qualitative, both time or cross-section, as well as the introduction to Econometrics, highlighting the usefulness of its tools and its applications to the economic science; the students should get used to the econometric terminology.				



<b>Contingency plan</b>	<p>1. Modifications to the contents</p> <p>No changes will be made.</p> <p>2. Methodologies</p> <p>*Teaching methodologies that are maintained</p> <p>All of them, but with the necessary adaptation/s to online teaching, according to what is stated in the next paragraph.</p> <p>*Teaching methodologies that are modified</p> <p>The guest lectures/keynote speeches will be adapted to distance learning by substituting class lessons by online teaching (using Teams) with the corresponding records for asynchronous access.</p> <p>3. Mechanisms for personalized attention to students</p> <p>For the personalized attention, Microsoft Teams will be used (twice a week), as well as Moodle and the e-mail (in an asynchronous manner).</p> <p>4. Modifications in the evaluation</p> <p>The evaluation activities will be the ones stated in this teaching guide, but they will be adapted to an online evaluation system. In the workshop/s and the mixed test/s there could be a combination of written and oral problem-solving exercises.</p> <p>*Evaluation observations:</p> <p>The second opportunity will use the same criteria than the first opportunity, which are summarized in 50% continuous evaluation and 50% exam.</p> <p>5. Modifications to the bibliography or webgraphy</p> <p>No changes will be made. Teaching materials are available in digital format, either in Moodle or in the subject website.</p>
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Study programme competences / results	
Code	Study programme competences / results
A1	CE1- Contribuír á boa xestión da asignación de recursos tanto no ámbito privado como no público.
A2	CE2-Identificar e anticipar problemas económicos relevantes en relación coa asignación de recursos en xeral, tanto no ámbito privado como no público.
A3	CE3-Aportar racionalidade á análise e á descripción de calquera aspecto da realidade económica.
A4	CE4-Avaliar consecuencias e distintas alternativas de acción e seleccionar as mellores, dados os obxectivos.
A5	CE5-Emitir informes de asesoramento sobre situación concretas da economía (internacional, nacional ou rexional) ou de sectores da mesma.
A7	CE7-Identificar as fontes de información económica relevante e o seu contido.
A9	CE9-Derivar dos datos información relevante imposible de recoñecer por non profesionais.
A10	CE10-Usar habitualmente a tecnoloxía da información e as comunicación en todo a seu desempeño profesional.
A11	CE11Leer e comunicarse no ámbito profesional en máis dun idioma, en especial en inglés.



A12	CE12-Aplicar á análise dos problemas criterios profesionais baseados no manexo de instrumentos técnicos.
A13	CE13-Comunicarse con fluidez no seu contorno e traballar en equipo.
B1	CB1 - Que os estudantes demostren posuir e comprender coñecementos nun área de estudo que parte da base da educación secundaria xeral, e que soe encontrar nun nivel que, aínda que se apoia en libros de texto avanzados, inclúe tamén algúns aspectos que implican coñecementos procedentes da vangarda do seu campo de estudo.
B2	CB2 - Que os estudantes saiban aplicar os seus coñecementos ó seu traballo ou vocación dun xeito profesional e posúan as competencias que se demostran por medio da elaboración e defensa de argumentos e a resolución de problemas dentro da su entorna de traballo.
B3	CB3 - Que os estudantes teñan a capacidade de reunir e interpretar datos relevantes (normalmente dentro da su área de estudo) para emitir xuízos que inclúan unha reflexión sobre temas relevantes de índole social, científica ou ética
B4	CB4 - Que os estudantes poidan transmitir información, ideas, problemas e solucións a un público tanto especializado como non especializado
B5	CB5 - Que os estudantes desenvolvesen aquelas habilidades de aprendizaxe necesarias para emprender estudos posteriores cun alto grao de autonomía
B6	CG1- Que os estudantes formados se convertan en profesionais capaces de analizar, reflexionar e intervir sobre os diferentes elementos que constitúen un sistema económico
B7	CG2 - Que os estudantes coñezan o funcionamento e as consecuencias dos sistemas económicos, as distintas alternativas de asignación de recursos, acumulación de riqueza e distribución da renda e estean en condicións de contribuír ao seu bo funcionamento e mellora
B8	CG3 -Que os estudantes sexan capaces de identificar e anticipar os problemas económicos relevantes, identificar alternativas de resolución, seleccionar as máis axeitadas e avaliar os resultados aos que conduce.
B9	CG4 -Que os estudantes respecten os dereitos fundamentais e de igualdade de oportunidades, non discriminación e accesibilidade universal das persoas con minusvalidez.
C1	CT1-Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
C3	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C4	CT2-Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común.
C5	CT3-Entender a importancia da cultura emprendedora e coñecer os medios ao alcance das persoas emprendedoras.
C6	CT4-Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C7	CT5-Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.
C8	CT6-Valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade.

Learning outcomes			
Learning outcomes	Study programme competences / results		
To learn and to manage some of the main statistical methods for dealing with and analyzing any type of economic information, both numerical and qualitative, both time series and cross-section.	A1	B1	C1
	A2	B2	C4
	A3	B3	C6
	A4	B4	C7
	A5	B5	C8
	A7	B6	
	A9	B7	
	A10	B8	
	A12	B9	
	A13		



To know and to correctly and accurately use the econometric terminology and language.	A1 A3 A4 A5 A7 A12	B1 B2 B3 B4 B5 B6 B7 B8 B9	C1 C4 C5 C6 C7 C8
To estimate and to interpret the parameters of the classical linear regression model. To understand how the model behaves and the situations where it should be applied.	A3 A4 A5 A7 A9 A10 A12 A13	B1 B2 B3 B4 B5 B6 B7 B8 B9	C1 C4 C6 C7 C8
To use the appropriate computer tools for carrying out the calculations and estimating the aforementioned models, both in the part related to Statistical Methods and in the Introduction to Econometrics part.	A9 A10 A11	B1 B2 B3 B4 B5 B6 B7 B8 B9	C3 C6 C8

Contents	
Topic	Sub-topic
1) Quantitative data analysis	<ul style="list-style-type: none"> <li>- Preparing data.</li> <li>- Preliminary analysis for statistical and econometric methods: Graphs and measures.</li> <li>- Measures of concentration.</li> </ul>
2) Qualitative data analysis	<ul style="list-style-type: none"> <li>- Preliminary analysis with qualitative variables: Graphs and tables.</li> <li>- Independence tests.</li> <li>- Measures of association for nominal and ordinal variables.</li> <li>- Statistical methods for qualitative variables.</li> </ul>
3) Econometrics and econometric models	<ul style="list-style-type: none"> <li>- Defining Econometrics.</li> <li>- Econometric models and their elements.</li> <li>- Types of models.</li> </ul>
4) The classical linear regression model	<ul style="list-style-type: none"> <li>- One-equation linear regression model.</li> <li>- Model estimation by Ordinary Least Squares.</li> <li>- Interpretation of the estimators and inference.</li> <li>- Goodness-of-fit. Measures.</li> </ul>
5) Analysis Of Variance	<ul style="list-style-type: none"> <li>- General concepts.</li> <li>- One factor: Fixed effects and completely random information.</li> <li>- Two factors: Fixed effects and completely random information.</li> </ul>



6) Time series modelling	<ul style="list-style-type: none"> <li>- Stochastic processes: Definition, general characteristics and examples.</li> <li>- Time series: Decomposition.</li> <li>- Time series: Introduction to ARIMA models.</li> </ul>
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Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Introductory activities	A1 A2 A7 A11 B9 B8 C5	1	0	1
Guest lecture / keynote speech	A2 A3 A4 A7 A12 C4	17	34	51
Workshop	A7 A10 B1	6	15	21
ICT practicals	A10 A12 C3 C6 C8	4	10	14
Collaborative learning	A5 A13 B2	4	10	14
Problem solving	A9 B3 C7	6	15	21
Supervised projects	A3 A4 A5 A7 A9 A10 A12 A13 C1 C3 C6 C7 C8	4	12	16
Mixed objective/subjective test	A4 A5 B4 B5 B6 B7 C1	2	6	8
Personalized attention		4	0	4

(\*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
Methodologies	Description
Introductory activities	The classes will start with an introduction to the subject; by means of this activity, the work to be carried out by the student will be explained in detail, as well as the assessment criteria.
Guest lecture / keynote speech	Lesson given by the lecturer that may have different formats (theory, problems and/or general examples, general guidelines of the subject, etc.). The lecturer might use audiovisual and computer means. In addition, s/he can introduce some questions posed to the students. The objective is to introduce the student into the concepts of the subject, in order to transmit the knowledge base that the student needs to start his/her work and his/her learning.
Workshop	The main objective in these classes will be the realization of especially practical tasks, with the lecturer's support and supervision: proposal and solution of applications from the theory, proposal and supervision of works, problems, exercises, presentations, expositions, debates and comments on works, solving doubts about the theory, etc. It is also possible that the lecturer explains some concepts, especially for clarifying their application, or in any case as a mere comment about the keynote speech.  Evaluation activities will be carried out during these classes; these activities will be individual or group exercises.
ICT practicals	The main objective in these classes will be the development of especially practical tasks, with the lecturer's support and supervision. The computer is employed in these classes, which are reserved for lessons or concepts where the intensity of the calculations needs the computer tool. In addition, the students are introduced into the work with Statistics and Econometrics by using computer means.
Collaborative learning	Work in groups of students in order to solve the tasks assigned by the teacher to optimize their own learning and that of the rest of classmates. Before handling the work in groups, several classes will be dedicated to pose the doubts and/or difficulties found when doing the work. In this manner, a debate is created among the students, their classmates and the lecturer, what encourages the interrelation in the work and the critical spirit.  Students will carry out group works so as to solve different theoretical-practical questions related to lessons of the syllabus; at the end, the group should present its work, with different possibilities regarding its presentation (oral or written); the election of the method will depend on the evolution of the teaching.
Problem solving	Personalized attention to the student in order to solve doubts related to the different lessons, not only when solving exercises but at any stage of the learning process.



Supervised projects	<p>In combination with collaborative learning and under lecturer supervision, the student will carry out works in groups focused on the learning of "how to do things". It is an option based on the assumption that the students care about their own learning.</p> <p>This teaching method is based on two basic elements: independent learning (students) and monitoring of that learning (lecturer-supervisor).</p> <p>The lecturer will develop the monitoring of this learning with the aim of assessing the acquisition of the knowledge defined for this category.</p>
Mixed objective/subjective test	<p>A mixed test will be carried out, which will correspond to the final exam. As this test is considered essential for the evaluation, it is necessary to obtain a minimum percentage of the total mark in order to compute (incorporate) the remaining evaluation activities.</p> <p>As an alternative to this mixed test and with the aim of promoting the continued work by the student, the lecturer will propose intermediate mixed tests along the teaching period. Passing all these intermediate tests is equivalent to pass the final test.</p>

### Personalized attention

Methodologies	Description
Problem solving ICT practicals Workshop Mixed objective/subjective test	<p>It involves the time the teacher takes in order to address and solve questions and doubts from the students, both in individual and (small) group manner. It consists of:</p> <ul style="list-style-type: none"> <li>- Solution of particular questions coming from the students as a result of the explanation and understanding of the theoretical concepts or their practical application.</li> <li>- Adaptation of the teaching of computer tools to the specific characteristics and needs of the students.</li> </ul>

### Assessment

Methodologies	Competencies / Results	Description	Qualification
Workshop	A7 A10 B1	<p>The main objective in these classes will be the realization of especially practical tasks, with the lecturer's support and supervision: proposal and solution of applications from the theory, proposal and supervision of works, problems, exercises, presentations, expositions, debates and comments on works, solving doubts about the theory, etc. It is also possible that the lecturer explains some concepts, especially for clarifying their application, or in any case as a mere comment about the keynote speech.</p> <p>Evaluation activities will be carried out during these classes; these activities will be individual or group exercises.</p>	20
Mixed objective/subjective test	A4 A5 B4 B5 B6 B7 C1	<p>A mixed test will be carried out, which will correspond to the final exam. As this test is considered essential for the evaluation, it is necessary to obtain a minimum percentage of the total mark in order to compute (incorporate) the remaining evaluation activities.</p> <p>As an alternative to this mixed test and with the aim of promoting the continued work by the student, the lecturer will propose intermediate mixed tests along the teaching period. Passing all these intermediate tests will be equivalent to pass the final test.</p>	50



Supervised projects	A3 A4 A5 A7 A9 A10 A12 A13 C1 C3 C6 C7 C8	In combination with collaborative learning and under lecturer supervision, the student will carry out one or several works in groups (in case of being more than one, at least one will be in groups, allowing for the possibility of individual works) focussed on the learning of "how to do things". It is an option based on the assumption that the students care about their own learning. This teaching method is based on two basic elements: independent learning (students) and monitoring of that learning (lecturer-supervisor). The lecturer will develop the monitoring of this learning with the aim of assessing the acquisition of the knowledge defined for this category.	30
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## Assessment comments

As the mixed test is considered essential for the evaluation, it will be necessary to obtain a minimum percentage of the total mark in order to compute (incorporate) the remaining evaluation activities.

These evaluation criteria apply to both the first and the second opportunity. The same criteria are applied to part-time students. In any case, these students should contact the coordinator of the subject so as to keep him informed of the situation.

In case of students opting for the early call opportunity, the evaluation system will be the same as stated in the scheme above. In this case, workshop activities and supervised projects should take place at least 21 days before the scheduled date for the early call opportunity.

The order of the lessons considered in this guide might be modified when explained during the classes, as a result of the teaching needs that might arise.

Some general remarks regarding the evaluation, in line with the remaining teaching guides:

- "Absent" mark. It corresponds to the student that only takes part in evaluation activities whose total weight is lower than 20% of the final mark, regardless of the mark they had obtained.
- Second opportunity and early call opportunity. The assessment criteria are the same for all the evaluation opportunities. With respect to the early call opportunity, workshop activities and supervised projects should take place at least 21 days before the scheduled date for the early call.
- Part-time and exemption-from-attendance students. It is recommended to contact the coordinator of the subject so as to keep him informed of the situation and try to adapt the evaluation system.
- Evaluation conditions. It is prohibited to enter the classroom where the evaluation activities take place with any device that allows for communication with the outside and/or information storage.
- Student identification. The student must give proof of identity, according to the existing regulation.

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p { margin-bottom: 0.25cm; background: transparent; line-height: 115%; background: transparent }

a:visited { color: #800000; so-language: zxx; text-decoration: underline }

a:link { color: #000080; so-language: zxx; text-decoration: underline }

strong { font-weight: bold }

## Sources of information



<p><b>Basic</b></p>	<ul style="list-style-type: none"> <li>- Ruiz-Maya, L., Martín Pliego, F. J., Montero, J. M., y Uriz, P. (1995). Análisis estadístico de encuestas: datos cualitativos. AC</li> <li>- Aparicio, J., Martínez, M., &amp; Morales, J. (2004). Modelos lineales aplicados en R (<a href="http://umh3067.edu.umh.es">http://umh3067.edu.umh.es</a>). Universidad Miguel Hernández. Dto. Estadística, Matemáticas e Informática</li> <li>- Casas, J.M., Domínguez, J., García, C., Martos, E.I., Rivera, L.F., y Zamora, A.I. (2010). Estadística para las Ciencias Sociales . Centro de Estudios Ramón Areces</li> <li>- Uriel, E. y Peiró, A. (2000). Introducción al Análisis de Series Temporales. AC</li> <li>- Ezequiel, J. U. (2019). Introducción a la econometría. . <a href="https://www.uv.es/uriel/libroes.htm">https://www.uv.es/uriel/libroes.htm</a></li> <li>- Uriel, E., Contreras, I., Moltó, T. y Peiró, A. (1990). Econometría. El modelo lineal. AC</li> <li>- Newbold, P., Carlson, W. and Thorne, B. (2012). Statistics for business and economics, 8/E.. Pearson: Boston.</li> <li>- Gujarati, D.M. (2003). Basic Econometrics. Mc Graw-Hill</li> </ul> <p>O libro Aparicio J. et al. (2004) podese descargar en <a href="http://umh3067.edu.umh.es">http://umh3067.edu.umh.es</a>O libro Aparicio J. et al. (2004) podese descargar en <a href="http://umh3067.edu.umh.es">http://umh3067.edu.umh.es</a></p>
<p><b>Complementary</b></p>	<ul style="list-style-type: none"> <li>- Newbold, P. (1997). Estadística para los Negocios y la Economía. Prentice Hall</li> <li>- Wooldridge, J. (2005). Introducción a la Econometría. Un enfoque moderno. Thomson</li> <li>- Gujarati, D. (2006). Principios de Econometría. McGraw-Hill</li> <li>- Wickham, H., &amp; Golemund, G. (2016). R for data science: import, tidy, transform, visualize, and model data (<a href="https://r4ds.had.co.nz/">https://r4ds.had.co.nz/</a>). O'Reilly Media, Inc</li> <li>- Heiss, F. (2016). Using R for Introductory Econometrics. Florian Heiss (<a href="http://www.urfie.net/read/index.html">http://www.urfie.net/read/index.html</a>)</li> <li>- Esteban, M. V., Moral, M. P., Orbe, S., Regúlez, M., Zarraga, A., &amp; Zubia, M. (2008). Econometría Básica Aplicada con GRETL (<a href="https://addi.ehu.es/bitstream/handle/10810/12496/08-09est.pdf?sequence=1&amp;isAllowed=y">https://addi.ehu.es/bitstream/handle/10810/12496/08-09est.pdf?sequence=1&amp;isAllowed=y</a>). Sarriko On, Universidad del País Vasco</li> <li>- Stock, J.H. &amp; Watson, M.W (2011). Introduction to Econometrics. Pearson</li> </ul> <p>O libro Heiss, F. (2016). Using R for Introductory Econometrics. Florian Heiss realiza os exercicios do Wooldrige con R, e pódese consultar online en:<a href="http://www.urfie.net/read/index.html">http://www.urfie.net/read/index.html</a>O mesmo ca os libros Wickham, H., &amp; Golemund, G. (2016) (en <a href="https://r4ds.had.co.nz/">https://r4ds.had.co.nz/</a>); Esteban, M.V. et al (2008) (en <a href="https://addi.ehu.es/bitstream/handle/10810/12496/08-09est.pdf?sequence=1&amp;isAllowed=y">https://addi.ehu.es/bitstream/handle/10810/12496/08-09est.pdf?sequence=1&amp;isAllowed=y</a>)</p>

### Recommendations

#### Subjects that it is recommended to have taken before

Statistics I/611G01006  
 Mathematics I/611G01009  
 Mathematics II/611G01010  
 Statistics II/611G01014

#### Subjects that are recommended to be taken simultaneously

#### Subjects that continue the syllabus

Econometrics I/611G01022  
 Econometrics II/611G01027

#### Other comments

ENGLISH GROUP Group A of this subject will be entirely taught in English. PREREQUISITES This subject continues the previous ones on Statistics. It is highly recommended to be familiar with the contents related to the first part of the subject. In order to complete Introduction to Econometrics, previous knowledge on economic theory, Statistics and Mathematics are required. In addition, as the econometric applications use data, it becomes important to know the structure and contents of the main statistical sources. TEACHING MATERIAL The main teaching material will be available from the Moodle virtual platform, or would be accessible from there. A sustainable use of the resources should be done, as well as try to prevent negative impacts on the natural environment.





(\*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.