



## Teaching Guide

| Teaching Guide      |                                                                                                                                                                                                  |        |                                                                     |           |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------|-----------|
| Identifying Data    |                                                                                                                                                                                                  |        |                                                                     | 2019/20   |
| Subject (*)         | Statistics I                                                                                                                                                                                     |        | Code                                                                | 611G01006 |
| Study programme     | Grao en Economía                                                                                                                                                                                 |        |                                                                     |           |
| Descriptors         |                                                                                                                                                                                                  |        |                                                                     |           |
| Cycle               | Period                                                                                                                                                                                           | Year   | Type                                                                | Credits   |
| Graduate            | 2nd four-month period                                                                                                                                                                            | First  | Basic training                                                      | 6         |
| Language            | SpanishGalicianEnglish                                                                                                                                                                           |        |                                                                     |           |
| Teaching method     | Face-to-face                                                                                                                                                                                     |        |                                                                     |           |
| Prerequisites       |                                                                                                                                                                                                  |        |                                                                     |           |
| Department          | Economía                                                                                                                                                                                         |        |                                                                     |           |
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| Lecturers           | Iglesias Vazquez, Emma Maria<br>Martinez Filgueira, Xose Manuel<br>Perez Lopez, Jose Benito                                                                                                      | E-mail | emma.iglesias@udc.es<br>xose.martinez@udc.es<br>benito.perez@udc.es |           |
| Web                 | www.udc.es/dep/ecoapl2/esteco1/economia/                                                                                                                                                         |        |                                                                     |           |
| General description | Knowing and understanding the essential concepts on Data Analysis, as well as the handling of its basic techniques.<br>Knowing and understanding the essential concepts on Probability Calculus. |        |                                                                     |           |

## Study programme competences

| Code | Study programme competences                                                                                                                                                                                                                                                                                                       |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.                                                                                                                                                                                          |
| A6   | CE6-Redactar proxectos de xestión económica a nivel internacional, nacional ou rexional. Integrarse na xestión empresarial.                                                                                                                                                                                                       |
| A7   | CE7-Identificar as fontes de información económica relevante e o seu contido.                                                                                                                                                                                                                                                     |
| A8   | CE8-Entender as institucións económicas como resultado e aplicación de representacións teóricas ou formais acerca de cómo funciona a economía.                                                                                                                                                                                    |
| 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 o 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 posuír 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 súa entorna de traballo.                                                            |
| B3   | CB3 - Que os estudantes teñan a capacidade de reunir e interpretar datos relevantes (normalmente dentro da súa 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.                                                                                                 |
| B10 |                                                                                                                                                                                                                                                                        |
| C1  | CT1-Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.                                                                                                                                                           |
| C2  | Dominar a expresión e a comprensión de forma oral e escrita dun idioma estranxeiro.                                                                                                                                                                                    |
| 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 |     |    |
| Knowing and understanding the essential concepts on Data Analysis and Descriptive Statistics.               | A1                          | B1  | C1 |
|                                                                                                             | A2                          | B2  | C2 |
|                                                                                                             | A3                          | B3  | C3 |
|                                                                                                             | A4                          | B4  | C4 |
|                                                                                                             | A5                          | B5  | C5 |
|                                                                                                             | A6                          | B6  | C6 |
|                                                                                                             | A7                          | B7  | C7 |
|                                                                                                             | A8                          | B8  | C8 |
|                                                                                                             | A9                          | B9  |    |
|                                                                                                             | A11                         | B10 |    |
|                                                                                                             | A13                         |     |    |
| Knowing and understanding the handling of the basic techniques on Data Analysis and Descriptive Statistics. | A3                          |     | C1 |
|                                                                                                             | A4                          |     | C3 |
|                                                                                                             | A5                          |     | C4 |
|                                                                                                             | A7                          |     | C5 |
|                                                                                                             | A9                          |     | C6 |
|                                                                                                             | A10                         |     | C7 |
|                                                                                                             | A11                         |     | C8 |
|                                                                                                             | A12                         |     |    |
|                                                                                                             | A13                         |     |    |



|                                                                           |     |  |    |
|---------------------------------------------------------------------------|-----|--|----|
| Knowing and understanding the essential concepts on Probability Calculus. | A3  |  | C1 |
|                                                                           | A4  |  | C4 |
|                                                                           | A5  |  | C5 |
|                                                                           | A7  |  | C6 |
|                                                                           | A9  |  | C7 |
|                                                                           | A11 |  | C8 |
|                                                                           | A13 |  |    |
| Handling the essential concepts on Probability Calculus.                  | A3  |  | C1 |
|                                                                           | A4  |  | C3 |
|                                                                           | A5  |  | C4 |
|                                                                           | A7  |  | C5 |
|                                                                           | A9  |  | C6 |
|                                                                           | A10 |  | C7 |
|                                                                           | A11 |  | C8 |
|                                                                           | A12 |  |    |
|                                                                           | A13 |  |    |
|                                                                           |     |  |    |

| Contents                                               |                                             |
|--------------------------------------------------------|---------------------------------------------|
| Topic                                                  | Sub-topic                                   |
| 0.- Introduction                                       | 0.1 What is Statistics?                     |
| 1.- Data Descriptive Analysis. Descriptive Statistics. | 1.1 One-dimensional analysis                |
|                                                        | 1.2 Two-dimensional analysis                |
| 2.- Probability                                        | 2.1 Introduction to Probability Calculus    |
| 3.- Random variables                                   | 3.1 One-dimensional random variables        |
|                                                        | 3.2 Two-dimensional random variables        |
| 4.- Analysis of the relationship between variables     | 4.1 Regression and correlation              |
| 5.- Random variables distributions                     | 5.1 Main distributions of a random variable |
| 6.- Convergence                                        | 6.1 Convergence and Central Limit Theorem   |
| 7.- Time series                                        | 7.1 Time series                             |
| 8.- Index numbers                                      | 8.1 Index numbers                           |

| Planning                        |                                     |                      |                               |             |
|---------------------------------|-------------------------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests           | Competencies                        | Ordinary class hours | Student's personal work hours | Total hours |
| Guest lecture / keynote speech  | A3 C1 C8                            | 17                   | 34                            | 51          |
| Workshop                        | A9 A12 C6 C7                        | 14                   | 28                            | 42          |
| ICT practicals                  | A10 C3                              | 5                    | 15                            | 20          |
| Workbook                        | A7 A11                              | 0                    | 5                             | 5           |
| Mixed objective/subjective test | A4 A5                               | 2                    | 4                             | 6           |
| Collaborative learning          | A13 C4 C5                           | 2                    | 2                             | 4           |
| Supervised projects             | A3 A4 A5 A7 A9 A10                  | 3                    | 9                             | 12          |
|                                 | A12 A13 C1 C3 C6<br>C7 C8           |                      |                               |             |
| Seminar                         | A3 A4 A7 A9 A10 A12<br>A13 C1 C3 C6 | 4                    | 0                             | 4           |



|                                                                                                                                 |                                                                                                                  |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---|---|---|
| Problem solving                                                                                                                 | A1 A2 A3 A4 A5 A6<br>A7 A8 A9 A10 A11<br>A12 A13 B2 B1 B3 B4<br>B5 B6 B7 B8 B10 B9<br>C1 C2 C3 C4 C5 C6<br>C7 C8 | 1 | 4 | 5 |
| Personalized attention                                                                                                          |                                                                                                                  | 1 | 0 | 1 |
| (*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. |                                                                                                                  |   |   |   |

| Methodologies                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Methodologies                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Guest lecture / keynote speech  | Lesson given by the teacher that may have different formats (theory, problems and/or general examples, general guidelines of the subject, etc.). The teacher 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 teacher'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 teacher explains some concepts, especially for clarifying their application, or in any case as a mere comment about the keynote speech.<br>Evaluation activities will be carried out during these classes; those 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 teacher'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 by using computer means.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Workbook                        | Reading of tests related to the subject or texts that complement what has been explained in the classroom.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Mixed objective/subjective test | 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 at least a 40% of the total mark in order to compute (incorporate) the remaining evaluation activities. As an alternative to this mixed test and with the aim of promoting the continued work by the student, the teacher will propose intermediate mixed tests along the teaching period. Passing all these intermediate tests is equivalent to pass the final test.                                                                                                                                                                                                                                                                                             |
| 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 teacher, who encourages the interrelation in the work and the critical spirit.<br>Students should carry out group works so as to solve different theoretical-practical questions related to different lessons of the syllabus; at the end, the group should present its work, with different possibilities regarding its exposition (oral or written), computer assessment; the election of the method will depend on the evolution of the teaching. |
| Supervised projects             | In combination with collaborative learning and under teacher supervision, the student will carry out works in groups 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 (teacher-supervisor).<br>The teacher will develop the monitoring of this learning with the aim of assessing the acquisition of the knowledge defined for this category.                                                                                                                                                                                                                                                                      |
| Seminar                         | Each group will be divided into two sub-groups of students (half the students each one). There will be four hours per student dedicated to seminars. These sessions may be used to solve doubts and to discuss about the different parts of the subject, as well as the activities and works proposed to be done on those topics.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Problem solving                 | Personalized attention to the student in order to solve doubts related to the different lessons, not only when solving exercises but in any stage of the learning process.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |



## Personalized attention

| Methodologies   | Description                                                                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Problem solving | Personalized attention to the student in order to solve the doubts that might appear, not only when solving the exercises but in any stage of the learning process. |

## Assessment

| Methodologies                   | Competencies                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Qualification |
|---------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Supervised projects             | A3 A4 A5 A7 A9 A10<br>A12 A13 C1 C3 C6<br>C7 C8 | In combination with collaborative learning and under teacher 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 (teacher-supervisor).<br>The teacher will develop the monitoring of this learning with the aim of assessing the acquisition of the knowledge defined for this category. | 15            |
| Mixed objective/subjective test | A4 A5                                           | 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 at least a 40% of the total mark in order to compute (incorporate) the remaining evaluation activities.<br>As an alternative to this mixed test and with the aim of promoting the continued work by the student, the teacher will propose intermediate mixed tests along the teaching period. Passing all these intermediate tests is equivalent to pass the final test.                                                                                                                                                       | 50            |
| Workshop                        | A9 A12 C6 C7                                    | The main objective in these classes will be the realization of especially practical tasks, with the teacher'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 teacher explains some concepts, especially for clarifying their application, or in any case as a mere comment about the keynote speech.<br>Evaluation activities will be carried out during these classes; those activities will be individual or group exercises.                                       | 35            |

## Assessment comments

As this test is considered essential for the evaluation, it is necessary to obtain at least a 40% of the total mark in order to compute (incorporate) the remaining evaluation activities.

These evaluation criteria apply to either the first and the second opportunity.

If a student underwent the advanced announcement, the evaluation system will be the one explained and presented in this guide. In this case, workshop activities and supervised projects should take place at least 21 days before the scheduled date for the advanced announcement.

## Sources of information

|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic | Espejo Miranda, I et al., ( 2006 ) Estadística Descriptiva y Probabilidad. Teoría y Problemas. Cádiz, Universidad de Cádiz. (libro libre, descargable en: <a href="http://knuth.uca.es/moodle/course/view.php?id=19">http://knuth.uca.es/moodle/course/view.php?id=19</a> )<br>Arriaza Gómez A.J. et al.(2008) Estadística Básica con R y R-Commander. Cádiz, Universidad de Cádiz. (libro libre, descargable en: <a href="http://knuth.uca.es/ebrcmdr">http://knuth.uca.es/ebrcmdr</a> ) |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



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|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Complementary</b> | <ul style="list-style-type: none"><li>- Cao Abad, R. y otros (1998). Estadística básica aplicada. Santiago de Compostela, Tórculo</li><li>- Gonick, L. y Smith, W. (2001). A Estatística en caricaturas!. SGAPEIO y Harper Collins</li><li>- Newbold, P., Carlson, W. and Thorne, B. (2010). Statistics for business and economics. Pearson/Prentice Hall</li><li>- Newbold, P. (1997). Estadística para los Negocios y la Economía. Madrid, Prentice Hall</li></ul> <p>PÉREZ, C. (2002) Estadística aplicada a través de Excel. Pearson Educación, Madrid. Charte Ojeda, F. (2008) Calculos Estadísticos con Excel. Anaya Multimedia, Madrid. Arriaza Gómez A.J. et al. (2008) Estadística Básica con R y R-Commander. Cádiz, Universidad de Cádiz. (libro libre, descargable en: <a href="http://knuth.uca.es/ebrcmdr">http://knuth.uca.es/ebrcmdr</a>)</p> |
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## Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Statistics II/611G01014

## Other comments

For those students with the entirely subject taught in English, the evaluation criteria will be the ones presented in this guide (that is, they apply for all groups). The support material, in this language, will be available in the virtual platform of the subject. At the beginning of the second semester, supplementary and explanatory rules will be provided to all the groups (the English group included).

(\*)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.