



| Teaching Guide      |                                                                                                                                                   |       |                |                             |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------|-----------------------------|
| Identifying Data    |                                                                                                                                                   |       |                | 2021/22                     |
| Subject (*)         | Statistics I                                                                                                                                      |       | Code           | 611G02006                   |
| Study programme     | Grao en Administración e Dirección de Empresas                                                                                                    |       |                |                             |
| 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                                                                                                                                          |       |                |                             |
| Coordinador         | Sanchez Selloero, Maria del Carmen                                                                                                                |       | E-mail         | c.sanchez@udc.es            |
| Lecturers           | Garcia-Carro Peña, Beatriz                                                                                                                        |       | E-mail         | beatriz.garcia-carro@udc.es |
|                     | Lado González, Eva Mª                                                                                                                             |       |                | eva.lado@udc.es             |
|                     | Sanchez Selloero, Maria del Carmen                                                                                                                |       |                | c.sanchez@udc.es            |
| Web                 |                                                                                                                                                   |       |                |                             |
| General description | In the first part of the subject, the aim is to learn and understand the basic concepts on Descriptive Statistics, Time Series and Index Numbers. |       |                |                             |
|                     | In the second part, the objective is to learn and understand the essential concepts on Probability Calculus.                                      |       |                |                             |



## Contingency plan

### 1. Modifications to the contents

No changes will be made.

We expect to be able to give all or most of the contents initially planned in a semi-distance or distance context.

### 2. Methodologies

\*Teaching methodologies that are maintained

The teaching methodologies contained in this guide are maintained:

- Introductory activities
- Guest lectures
- Workshop
- ICT practicals (already planned in a virtual manner)
- Objective test
- Personalized attention (already planned in a virtual manner)

Small Tutorial Sessions are already planned in a virtual manner, following the instructions given from the faculty due to Covid-19; the same happens with the individual or group tutorial sessions (office/official hours). All the teaching that would take place in the computer room will be also developed in a virtual manner.

\*Teaching methodologies that are modified

In case of semi-distance learning, there will be a combination of face-to-face and distance lessons, and in case of distance learning, all face-to-face teaching will be substituted by online lessons. In both cases, Teams will be used to give lessons in the distance mode.

In any case (in both face-to-face and distance contexts), extensive material will be uploaded to the Moodle platform so as to facilitate the learning of the theoretical part and the solution of exercises. The forum in Moodle and that of Teams will be used to communicate to the students all those issues that affect the regular functioning of the subject, which also helps to keep the contact with them (notices on evaluation activity dates, instructions for carrying out the activities, marks, any change in scheduled dates, tutorial sessions, etc.).

### 3. Mechanisms for personalized attention to students

- E-mail. This tool can be used at any time. It is useful to make inquiries, to request virtual meetings in order to solve doubts/questions and to monitor the subject.
- Teams. This tool will also be used as a means of communication with the students, as well as to carry out either individual or group tutorial sessions. We understand that this tool is more agile than the e-mail.
- Moodle. Use of its communication tools.

### 4. Modifications in the evaluation

\*Evaluation observations:

With respect to the evaluation, the assessment criteria contained in this guide will be applied to either a context of semi-distance learning or one of distance learning, except for the fact that the minimum percentage required for the objective exams (related to the two main parts of the subject) will be eliminated, that is, the 3 points mentioned in the evaluation system.

The evaluation activities will be developed in a distance manner by means of the corresponding virtual platforms.

### 5. Modifications to the bibliography or webgraphy

No changes will be made. The students have the digitalized teaching material in Moodle.

In any case, further material will be made available for the students so as to prepare the theoretical and applied contents of the subject; Moodle will be the platform and repository of the teaching material for the students.

From the beginning of the health crisis, the Library of the Faculty of Economics and Business informed about the free electronic access to a notable number of books, which are available to both students and teachers. If possible, free access to bibliography and additional material will be facilitated.



| Study programme competences |                                                                                                                                                                                                                                                                                       |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Code                        | Study programme competences                                                                                                                                                                                                                                                           |
| A4                          | Elaborate advisory reports on specific situations of companies and markets                                                                                                                                                                                                            |
| A6                          | Identify the relevant sources of economic information and to interpret the content.                                                                                                                                                                                                   |
| A7                          | Understand economic institutions as a result and application of theoretical or formal representations which explain the evolution of the economy.                                                                                                                                     |
| A8                          | Derive, based on from basic information, relevant data unrecognizable by non-professionals.                                                                                                                                                                                           |
| A10                         | Read and communicate in a professional environment at a basic level in more than one language, particularly in English                                                                                                                                                                |
| A11                         | To analyze the problems of the firm based on management technical tools and professional criteria                                                                                                                                                                                     |
| A12                         | Communicate fluently in their environment and work by teams                                                                                                                                                                                                                           |
| B1                          | CB1-The students must demonstrate knowledge and understanding in a field of study that part of the basis of general secondary education, although it is supported by advanced textbooks, and also includes some aspects that imply knowledge of the forefront of their field of study |
| B2                          | CB2 - The students can apply their knowledge to their work or vocation in a professional way and have competences typically demonstrated by means of the elaboration and defense of arguments and solving problems within their area of work                                          |
| B3                          | CB3- The students have the ability to gather and interpret relevant data (usually within their field of study) to issue evaluations that include reflection on relevant social, scientific or ethical                                                                                 |
| B4                          | CB4-Communicate information, ideas, problems and solutions to an audience both skilled and unskilled                                                                                                                                                                                  |
| B5                          | CB5-Develop skills needed to undertake further studies learning with a high degree of autonomy                                                                                                                                                                                        |
| B6                          | CG1-Perform duties of management, advice and evaluation in business organizations                                                                                                                                                                                                     |
| B7                          | CG2-Know how to use the concepts and techniques used in the various functional areas of the company and understand the relationships between them and with the overall objectives of the organization                                                                                 |
| B10                         | CG5-Respect the fundamental and equal rights for men and women, promoting respect of human rights and the principles of equal opportunities, non-discrimination and universal accessibility for people with disabilities.                                                             |
| C1                          | Express correctly, both orally and in writing, in the official languages of the autonomous region                                                                                                                                                                                     |
| C4                          | To be trained for the exercise of citizenship open, educated, critical, committed, democratic, capable of analyzing reality and diagnose problems, formulate and implement knowledge-based solutions oriented to the common good                                                      |
| C5                          | Understand the importance of entrepreneurial culture and know the means and resources available to entrepreneurs                                                                                                                                                                      |
| C6                          | Assess critically the knowledge, technology and information available to solve the problems and take valuable decisions                                                                                                                                                               |
| C7                          | Assume as professionals and citizens the importance of learning throughout life.                                                                                                                                                                                                      |
| C8                          | Assess the importance of research, innovation and technological development in the economic and cultural progress of society.                                                                                                                                                         |

| Learning outcomes                                                                                        |                             |     |    |
|----------------------------------------------------------------------------------------------------------|-----------------------------|-----|----|
| Learning outcomes                                                                                        | Study programme competences |     |    |
| Knowing and understanding the handling of basic techniques for Data Analysis and Descriptive Statistics. | A4                          | B6  | C1 |
|                                                                                                          | A6                          | B10 | C5 |
|                                                                                                          | A7                          |     | C6 |
|                                                                                                          | A8                          |     | C7 |
|                                                                                                          | A10                         |     | C8 |
| Knowing and understanding the fundamentals on Data Analysis and Descriptive Statistics.                  | A4                          | B1  | C1 |
|                                                                                                          | A10                         | B2  | C4 |
|                                                                                                          | A11                         |     | C5 |
|                                                                                                          | A12                         |     | C6 |
|                                                                                                          |                             |     | C7 |
|                                                                                                          |                             |     | C8 |



|                                                                     |    |          |                                  |
|---------------------------------------------------------------------|----|----------|----------------------------------|
| Knowing and understanding the fundamentals on Probability Calculus. | A4 | B3<br>B4 | C1<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Handling the basic concepts on Probability Calculus.                | A4 | B5<br>B7 | C8                               |

| Contents                                          |                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Topic                                             | Sub-topic                                                                                                                                                                                                                                                                                                                                    |
| LESSON 1: ONE-DIMENSIONAL FREQUENCY DISTRIBUTIONS | 1.1. Statistics: concept and contents<br>1.2. The statistical analysis<br>1.3. Frequency distribution: concept and graphs<br>1.4. Moments in one-dimensional distributions<br>1.5. Measures of central tendency and position<br>1.6. Measures of dispersion or variability<br>1.7. Measures of shape<br>1.8. Outliers: detection and effects |
| LESSON 2: TWO-DIMENSIONAL FREQUENCY DISTRIBUTIONS | 2.1. Two-dimensional frequency distributions<br>2.2. Moments in two-dimensional distributions<br>2.3. Regression and correlation                                                                                                                                                                                                             |
| LESSON 3: TIME SERIES                             | 3.1. Time series: concept and graphs<br>3.2. Decomposition of a time series: components and scheme<br>3.3. Trend analysis<br>3.4. Seasonality analysis. Seasonally adjusted time series<br>3.5. Variation rates analysis in a time series context                                                                                            |
| LESSON 4: INDEX NUMBERS                           | 4.1. Introduction<br>4.2. Composite indexes<br>4.3. Application of index numbers<br>4.4. Main indexes in the Spanish economy                                                                                                                                                                                                                 |
| LESSON 5: INTRODUCTION TO PROBABILITY CALCULUS    | 5.1. Deterministic phenomena and random phenomena<br>5.2. Probability: definition and postulates<br>5.3. Conditional probability. Independence of events<br>5.4. Probability theorems                                                                                                                                                        |
| LESSON 6: ONE-DIMENSIONAL RANDOM VARIABLE         | 6.1. One-dimensional random variable<br>6.2. Discrete random variables: probability distribution function and cumulative probability distribution<br>6.3. Continuous random variables: density functions and cumulative distribution<br>6.4. Characteristics of one-dimensional random variables                                             |
| LESSON 7: RANDOM VARIABLES: MAIN DISTRIBUTIONS    | 7.1. Bernoulli distribution<br>7.2. Binomial distribution<br>7.3. Poisson distribution<br>7.4. Uniform distribution<br>7.5. Normal distribution<br>7.6. Distributions derived from the Normal distribution                                                                                                                                   |
| LESSON 8: CONVERGENCE AND CENTRAL LIMIT THEOREM   | 8.1. Convergence in probability<br>8.2. Convergence in distribution<br>8.3. Central Limit Theorem                                                                                                                                                                                                                                            |



## Planning

| Methodologies / tests          | Competencies                               | Ordinary class hours | Student's personal work hours | Total hours |
|--------------------------------|--------------------------------------------|----------------------|-------------------------------|-------------|
| Introductory activities        | B5 C6 C7 C8                                | 1                    | 0                             | 1           |
| Guest lecture / keynote speech | A4 A7 A11 B1 B4 B7 C1 C5                   | 17                   | 34                            | 51          |
| Workshop                       | A6 A10 A11 A12 B2 B3 B5 B6 B10 C1 C4 C5 C6 | 17                   | 42.5                          | 59.5        |
| ICT practicals                 | A8 A10 A11 C4 C8                           | 8                    | 16                            | 24          |
| Objective test                 | A4 A6 A12 B2 B3 B5 B7 C1 C6                | 2                    | 6                             | 8           |
| Personalized attention         |                                            | 6.5                  | 0                             | 6.5         |

(\*)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        | It consists of introducing the subject and presenting the activities that the students must develop, as well as the criteria with which they will be evaluated.                                                                                                                                                                                      |
| Guest lecture / keynote speech | Each keynote session consists of the lecturers' oral exposition of concepts and methods, together with the active participation of the students. The presentation is complemented with the use of audiovisual media and includes examples and exercises that make it possible to highlight the limitations and possibilities of the methods exposed. |
| Workshop                       | Each workshop is an interactive session in which applications, exercises and problems are developed; they allow the students to understand the theoretical foundations of the subject and learn to value, from a critical point of view, the results obtained.                                                                                       |
| ICT practicals                 | These are interactive sessions dedicated to learning the appropriate computer tools to carry out empirical applications of the methods presented in the theoretical sessions. They will be developed in a virtual manner. They will be either individual or in groups.                                                                               |
| Objective test                 | It is a written test to evaluate the degree of learning.                                                                                                                                                                                                                                                                                             |

## Personalized attention

| Methodologies                                | Description                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Workshop<br>ICT practicals<br>Objective test | It is the time the lecturer takes in order to address and solve questions coming from the students, in an individual or group manner. The individual or group tutorial sessions (office/official hours) will be developed in a virtual manner, following the instructions given by the Faculty due to COVID-19.<br>Small Tutorial Sessions will be developed in a virtual manner, too. |

## Assessment

| Methodologies | Competencies                               | Description                                                                                                                                                                                                                                                                                     | Qualification |
|---------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Workshop      | A6 A10 A11 A12 B2 B3 B5 B6 B10 C1 C4 C5 C6 | By means of this activity, the students should solve and hand-in the tests, problems, exercises and questions proposed, in the manner that will be explained in the first days of class.<br>A given percentage of the 30% involved in this workshop activity will correspond to ICT practicals. | 30            |



|                |                                |                                                                                                                                                                                                                                                                              |    |
|----------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Objective test | A4 A6 A12 B2 B3 B5<br>B7 C1 C6 | The objective test for assessing the learning process combines conceptual and reasoning questions with practical or applied ones.<br><br>Two tests will be developed; they correspond to the two main parts of the subject: Descriptive Statistics and Probability Calculus. | 70 |
|----------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|

## Assessment comments

The objective tests (assessment tests) are considered essential in the evaluation system; for this reason, it will be necessary to obtain at least a 30% of

the total mark in each one of them (that is, 3 points) so as to compute with the remaining evaluation activities.

The first assessment exam will be considered as "passed"

conditioned to obtaining a mark equal or higher than 3 points. If this first exam

is "passed", in the final (official) exam it will only be necessary

to do the second assessment exam, which also requires a minimum mark. The second assessment exam takes place the very same day of the first opportunity exam (May/June) for all the students.

Those students who have not reached the minimum mark in the two objective tests (assessment tests) but get a mark higher than 5 points in the global

count of the evaluation will not have passed the subject and their mark in the

final official record will be 4.5 points. The subject will be passed when at least five points (or more)

were obtained in the global count of the subject, conditioned to have reached

the minimum mark in the two assessment tests. The student will attend the first and/or the second opportunity to repeat the test were the minimum mark was not achieved.

For the students who have "passed" one part of the

subject by means of an objective test (assessment test): this fact will only have

validity for the current academic year. If a student with one part of the

subject "passed" is not able to pass the whole subject in the

opportunities of May/June or July, his/her final mark will be "failing"

and he/she will have to re-take the whole subject in other academic year.

"ABSENT" MARK. According to the regulation approved by the Faculty Board, the people that only take part in evaluation activities whose total weight is lower than the 20% of the final mark will get "Absent" as their final mark.

SECOND OPPORTUNITY. Evaluation criteria for the second opportunity will be the same as for the first opportunity.

EARLY CALL OPPORTUNITY. The evaluation corresponding to the early opportunity will be developed through a single exam that will be valued with a maximum of 10 points, and that will have as basis the complete syllabus described in the section "Contents" of the guide of the current academic course. To pass the subject it will be necessary to obtain a minimum of 5 points in this exam. These conditions of evaluation are specific for the early opportunity and will only be applied in this case.

STUDENTS WITH RECOGNITION OF PART-TIME DEDICATION. The evaluation system previously described will be valid for all the students, regardless of their academic situation. Part-time students, although are exempt from attendance, will have the same evaluation criteria and the same exam dates than full-time students.

EVALUATION CONDITIONS. Following the rules approved

by the Faculty Board, it is forbidden to enter the classroom where the

evaluation activities are being held with any device that allows for communicating with the outside and/or information storage.

As is mandatory, the rules of evaluation, review and claim of the qualifications of the studies of degree and university Master of the UDC will apply to the evaluation tests ([https://www.udc.es/export/sites/udc/normativa/\\_galeria\\_down/](https://www.udc.es/export/sites/udc/normativa/_galeria_down/Academica/Normas_avalacion_revision_reclamacion_consolidado_I.pdf)

[Academica/Normas\\_avalacion\\_revision\\_reclamacion\\_consolidado\\_I.pdf](https://www.udc.es/export/sites/udc/normativa/_galeria_down/Academica/Normas_avalacion_revision_reclamacion_consolidado_I.pdf)). It is recommended to pay special attention to articles 10. Student identification, and 14. Fraud and disciplinary responsibilities Commission.

## Sources of information



|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>         | <ul style="list-style-type: none"> <li>- Casas Sánchez, J. M. y otros (2006). Ejercicios de Estadística Descriptiva y probabilidad. Madrid, Pirámide</li> <li>- Martín-Pliego, F. J., Montero, J. M. y Ruiz-Maya, L. (2006). Problemas de Probabilidad. Madrid, Thomson</li> <li>- Martín-Pliego, F. J. y Ruiz-Maya, L. (2006). Fundamentos de Probabilidad. Madrid, Thomson</li> <li>- Esteban García, J. y otros (2004). Estadística Descriptiva y nociones de Probabilidad. Madrid, Thomson</li> <li>- Montiel, A. M., Rius, F. y Barón, F. J. (1997). Elementos básicos de Estadística Económica y Empresarial. Madrid, Prentice Hall</li> <li>- Levine, D. M. et al. (2011). Statistics for managers using MS Excel, 6/E. Prentice Hall</li> <li>- Levine, D. M., Krehbiel, T. C. and Berenson, M. L. (2010 (5th ed.)). Business Statistics: A first course. Upper Saddle River, Pearson Education</li> <li>- Newbold, P., Carlson, W. and Thorne, B. (2012). Statistics for business and economics, 8/E. Pearson: Boston</li> </ul> <p>Os tres últimos libros servirán como referencia bibliográfica para o grupo de inglés (grupo A) desta materia.</p> |
| <b>Complementary</b> | <ul style="list-style-type: none"> <li>- García-Carro Peña, B., Sánchez Sello, M. C. y Martínez Filgueira, X. M. (2003). Curso práctico de Probabilidad con aplicaciones económicas. Universidad da Coruña</li> <li>- Cao Abad, R. y otros (2001). Introducción a la Estadística y sus aplicaciones. Madrid, Pirámide</li> <li>- Sáenz, J. A., Bedate, A., Rivas, A. y González, J. (1996). Problemas de Estadística Descriptiva Empresarial. Madrid, Ariel</li> <li>- Tomeo Perucha, V. y Uña Juárez, I. (2009). Estadística Descriptiva. Madrid, Garceta</li> <li>- Uña Juárez, I., San Martín Moreno, J. y Tomeo Perucha, V. (2010). Cálculo de Probabilidades. Madrid, Garceta</li> <li>- Benítez Márquez, M.D. y otros (2012). Estadística Descriptiva. Madrid, McGraw-Hill</li> </ul>                                                                                                                                                                                                                                                                                                                                                                    |

## Recommendations

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

Mathematics I/611G02009

### Subjects that are recommended to be taken simultaneously

Mathematics II/611G02010

### Subjects that continue the syllabus

Statistics and Introduction to Econometrics/611G02014

### Other comments

Group A of this subject will be taught entirely in English.

(\*)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.