

TEACHING GUIDE

STATISTICS II

GRADO EN ECONOMÍA (INGLÉS)

ACADEMIC YEAR 2026-27

Publication date: 05-07-2026



I.-Subject Identification

Type	OBLIGATORIA
Teaching period	1 course, 2Q semester
Nº of credits	4.5
Language in which the subject is taught	English

II.-Presentation

The Statistics II course focuses on the branch of Statistics dedicated to Inference. The main objective of the course is for students to acquire a solid understanding of the fundamentals of statistical inference, particularly parameter estimation, confidence intervals, and hypothesis testing.

The primary goals of the course are:

- To familiarize students with the basic concepts of statistical inference.
- To ensure that, upon completion of the course, students are capable of applying various quantitative techniques covered in the curriculum.
- To contribute rationality to the analysis and description of any aspect of economic reality.
- To identify relevant economic information sources and understand their content.

PREREQUISITES: The knowledge acquired in prior courses on statistics and mathematics (differentiation and integration) is essential.

III.-Learning outcomes

CT07. Ability to solve problems
 CT08. Ability to make decisions
 CT10. Interdisciplinary teamwork
 CT15. Ability to learn independently
 CB02 . That students are able to apply their knowledge to their work or vocation in a professional manner and have the skills that are typically demonstrated through the preparation and defense of arguments and problem solving within their field of study.
 CB03 . That students have the ability to gather and interpret relevant data (usually within their field of study) to express judgments that include a reflection on relevant topics related to social, scientific or ethical areas.
 CB05 . That students have developed the learning skills needed to undertake further studies with a considerable degree of autonomy.
 CE06. Ability to learn and apply the different qualitative techniques used in economics
 CE14. Ability to convert an empirical problem into an area of research and reach conclusions

- Key for degrees not adapted to RD 822/21: **CB** - basic competences, **CG** - generic competences, **CE** - specific competences, **CT** - transversal competences.
- Key for degrees adapted to RD 822/21: **CON** - knowledge, **COM** - competences, **HAB** - skills.



IV.-Contents

IV.A.-Syllabus

Thematic unit	Topic	Sections
I.- Sampling	Topic 1.	Populations, samples and sampling distributions
II. Estimation	Topic 2.	Properties of estimators
	Topic 3.	Point estimation.
	Topic 4.	Maximum likelihood estimation
	Topic 5.	Confidence Intervals
	Topic 6.	Confidence intervals: additional topics
III.- Hypothesis testing	Topic 7.	Foundations of hypothesis testing (H_0 , H_1 , Type I & II errors, p-value)
	Topic 8.	Hypothesis testing: Single population
	Topic 9.	Hypothesis testing: Additional topics

IV.B.-Training activities

Type	Title
Theoretical sessions	Theoretical classes
Theoretical sessions	Presentation of theoretical and theoretical-practical topics by the professor with participatory attendance from the students.
Resolution of exercises, problems, case studies	Solving exercises, problems, cases
Resolution of exercises, problems, case studies	Problem solving proposed by the professor



V.-Student workload

Theoretical sessions	20
Resolution of exercises, problems, case studies, etc.	20
Practical sessions in experimental, technological and clinical laboratories, fieldwork, etc.	0
Tests and/or exams	5
Academic tutorials	30
Related activities: conferences, seminars, etc.	6
Preparation of theoretical sessions and self-study	14
Preparation of practical tasks, exercises, case studies, projects, etc.	20
Preparation for tests and/or exams	20
Total student workload	135

VI.-Methodology and academic programme

Type	Period	Content
Tests and/or exams	Week 5 to Week 14	Cover any questions about the course that may arise from the students.
Theoretical sessions	Week 1 to Week 14	Lecture. Presentation and explanation of the basic theoretical aspects included in the course content.
Practical sessions	Week 1 to Week 14	Problem solving. Complement the theoretical aspects with practical problems that demonstrate their application in common situations in the economic and business fields.



VII.-Assessment methods

The general assessment method is continuous as established in the *Regulation for the Assessment of Learning Outcomes* of Rey Juan Carlos University.

All the assessment systems established in the degree report must be employed, except for those that have a minimum weight of 0%, which can be used by professors in the academic years they consider relevant. Each assessment system may be applied through one or more assessment activities, consistent with the system. No assessment activity can exceed individually 60% of the overall grade for the subject.

The sum of non re-evaluable activities cannot exceed 40% of the overall grade for the subject and, in general, should not have an established minimum grade (except for practical activities in which, strictly speaking, the conditions of the ordinary call cannot be reproduced in the extraordinary call).

Those students who do not manage to pass the subject in the ordinary call, or do not attend this first call, may attend the extraordinary call only for failed re-evaluable assessment activities.

The distribution and characteristics of the assessment activities are described below.

VII.A.-Description and weight of the assessment activities



Ordinary Assessment

Exam Week 6: Estimation Basic Concepts

- **Weight:** 15% of the final grade
- **Content:** Assesses students' understanding of fundamental estimation concepts covered in the first part of the course.
- **Format:** May include multiple-choice questions, short-answer problems, and/or practical estimation exercises.
- **Reassessment:** Non-reassessable; no retake will be offered. This exam forms part of a continuous assessment process designed to support methodological learning and ongoing student development.
- **Note:** The exam is scheduled for week 6 but may be postponed by up to one week at the professor's discretion.

Exam Week 13: Hypothesis testing Basic Concepts

- **Weight:** 25% of the final grade
- **Content:** Focuses on the core principles of hypothesis testing as discussed in class.
- **Format:** May include theoretical questions, practical applications, and/or interpretation of statistical results.
- **Reassessment:** Non-reassessable; no retake will be offered. This exam forms part of a continuous assessment process designed to support methodological learning and ongoing student development.
- **Note:** The exam is scheduled for week 13 but may be postponed by up to one week at the professor's discretion.

Final Exam: January (in the official exam date as published by the university, in-person)

- **Weight:** 60% of the final grade
- **Content:** Comprehensive, covering all course topics, including estimation theory and hypothesis testing, and any additional material discussed throughout the semester.
- **Format:** May consist of a combination of multiple-choice questions, problem-solving exercises, and/or essay-style questions.
- **Reassessment:** Reassessable. Students who do not pass may retake the final exam during the official extraordinary assessment period in June.

Extraordinary Assessment

Only the third exam is eligible for reassessment in the extraordinary session. It may consist of a combination of multiple-choice questions, problem-solving exercises, and/or essay-style questions. This exam will take place in-person, on the official date as set by the university, and carries a weight of 60% of the final grade. The first and second exams cannot be retaken, as they form part of a continuous assessment process designed to support methodological learning and ongoing student development.

Early Exam Session

The assessment in the Early Exam Session will consist of a single in-person exam covering 100% of the course content, held on the date specified in the university's official exam schedule. This exam replaces all other assessment activities; no grades from midterm exams or any other activities carried out during the academic year are retained or considered. A score of 5 out of 10 or higher is required to pass.

Additional Notes

- **Passing Grade:** A final score of 5 out of 10 or higher is required to pass the course in any of the assessments.
- **Minimum Mark Requirement:** There is no minimum numerical threshold required in any individual midterm exam for scores to be combined into the final grade. However, a score below 2 out of 10 in any major content block within the final exam — estimation theory or hypothesis testing — will be considered as insufficient demonstration of the learning outcomes for that area. In such cases, the student will not pass the subject regardless of the weighted sum of grades. This criterion is intended to ensure that all core competences of the course are adequately acquired, and not merely compensated by performance in other areas. Students will be informed of this criterion at the beginning of the course.
- **Exam Delays:** Exams 1 and 2 may be delayed by up to one week if deemed necessary by the professor. Any changes to the schedule will be communicated in advance.
- **Non-reassessable Exams:** Only the final exam is reassessable. The midterm exams (weeks 6 and 13) cannot be retaken or



reassessed, as they form part of a continuous assessment process designed to support methodological learning and ongoing student development. However, although they are non-reassessable, **the content covered in those exams (estimation theory and hypothesis testing basic concepts) may still be assessed in the final and extraordinary exams**, as the acquisition of all course competences is required to pass the subject.

•**Grade Calculation:** The final grade will be calculated as the weighted sum of the three assessments as described above.

VII.B. Assessment of students with academic exemption from class attendance

Having Academic Exemption from Class Attendance (DAAC) does not imply that students are automatically exempt from participating in the continuous assessment activities or in the training activities of compulsory attendance as established in the teaching guide. Once the exemption has been granted, students must contact the subject's teaching staff, who will propose the adaptations he/she may consider relevant, as long as they guarantee the acquisition and adequate assessment of the learning goals established. Students must maintain adequate communication with the teaching staff so that they may provide information on the dates for training and assessment activities, if these are not established in the programme and available for students at the time of achieving the exemption.

Subject with possibility of academic exemption: Yes.

VII.C. Review of assessment activities

In accordance with the Regulation for the Assessment of Learning Outcomes of Rey Juan Carlos University.

VII.D.-Students with a disability or special educational needs

In order to guarantee equal opportunities, non-discrimination, universal accessibility and academic success, students with disabilities or especial education needs may request curricular adaptations to follow their studies. These adaptations will be provided by the Unit of Attention to People with Disabilities of Rey Juan Carlos University, in accordance with the regulation which regulates the service for the Attention of People with Disabilities at the University. This Unit will issue a report for curricular adaptations, so that students with disabilities or special education needs must contact the service (at e-mail discapacidad.programa@urjc.es) in order to provide relevant information for different educational alternatives.

VII.E.-Academic behaviour, academic integrity and honesty

Rey Juan Carlos University is fully committed to the highest standards of academic integrity and honesty, so studying at the URJC means assuming and subscribing to the values of integrity and academic honesty set out in the University's Ethical Code. To support this process, the University has Rey Juan Carlos University's Academic Conduct Regulation as well as different tools (anti-plagiarism, supervision...) that offer a collective guarantee for the full development of these essential values.

VIII.-Teaching resources and materials

Basic bibliography

Title: Statistics for Business and Economics (10Th. Ed.)

Author: Newbold, P., Carlson, W.L. and Thorne, B.

Publisher: Pearson

Consultation bibliography

Title: Introduction to Mathematical Statistics

Author: Robert V. Hogg, Craig, Allen T. and McKean Joseph W.

Publisher: Prentice-Hall

Title: *Applied Statistics and Probability for Engineers*

Author: Montgomery, D.C. and Runger, G.C.

Publisher: Wiley

IX.-Professors

Name and surname	MIGUEL ÁLVAREZ GARCÍA
E-mail address	miguel.alvarez@urjc.es
Department	Economía Aplicada I e Historia e Instituciones Económicas
Campus	Madrid - Quintana
Category	Profesor/a Asociado/a
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorías póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docencia	0

