

TEACHING GUIDE

APPLIED ECONOMETRICS (SEMIPRESENCIAL)

GRADO EN ECONOMÍA (INGLÉS)

ACADEMIC YEAR 2026-27

Publication date: 04-07-2026



I.-Subject Identification

Type	OPTATIVA
Teaching period	4 course, 2Q semester
Nº of credits	6
Language in which the subject is taught	English

II.-Presentation

The aim of this course is to equip students with fundamental econometric tools for economic analysis and their application in evaluating the impact of public policies and business investments on economic growth. We will delve into five key econometric methodologies for causal inference, including random experiments, regression, instrumental variables, difference-in-differences, and regression discontinuity. These tools will be explored through real-world examples and practical applications using econometric software and spreadsheets, enabling students to understand and analyze economic trends effectively.

This blended learning course will be driven by student-focused learning methods, using our virtual classroom as the primary communication tool between teachers and students. Regular engagement with the virtual classroom is expected from students. Our teaching approach emphasizes guiding students through their learning journey via the virtual campus, which will facilitate student-teacher interaction, the presentation of new topics, distribution of study materials, organization of individual and group activities, and general communication.

Prerequisite knowledge for this course includes a theoretical grounding in econometrics and practical experience with econometric tools and spreadsheets.

TEACHING METHODOLOGY & STUDENT COMMUNICATION

Our teaching methodology is a blend of online learning, self-guided study, and tutoring. The course will have a sequential structure, consisting of mandatory tasks and more complex, voluntary assignments to challenge the students' understanding and facilitate deeper learning.

III.-Learning outcomes

- CT05. Knowledge of information systems relating to the field of study
- CT06. Ability to analyse and search for information from different sources
- CT07. Ability to solve problems
- CT08. Ability to make decisions
- 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.
- CB04 . That students are able to transmit information, ideas, problems and solutions to both specialized and non-specialized audience.
- CB05 . That students have developed the learning skills needed to undertake further studies with a considerable degree of autonomy.
- CE01. Ability to put knowledge of economics into practice
- CE02. Information search and research skills
- 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
- CE19. Forecasting with different economic variables



- 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

Chapter I: Introduction. The Role of Simulation Models in Business Management and Public Policy.

Chapter II. Determining the Macroeconomic Effects of Business Activity and Public Spending. Input-Output (IO) Tables as a Tool for Integrating Micro and Macroeconomic Information.

Chapter III: Random Experiments. This section investigates the inherent randomness of experiments, ensuring that the variable of interest remains unaffected by additional influences that might condition the results. It also introduces Instrumental Variables as a common solution to issues such as omitted variables, measurement errors in explanatory variables, sample self-selection bias, and simultaneous equation estimation problems.

Chapter IV: Regression and Difference-in-Differences. The difference-in-differences methodology uses time-based variations and disparities between two groups. This approach contrasts the change in the treated group over time against the control group's change. Within a multiple regression context, the difference-in-differences is examined through the interaction term between the treatment group and the post-treatment period. It serves as a valuable method for estimating credible statistical causal inference in the realm of observational studies for public program evaluation.

Chapter V: Instrumental Variables and Regression Discontinuity Designs. The Instrumental Variables technique uses specific variables known as instruments to determine an exogenous portion of the variability from the endogenous predictor. The Regression Discontinuity Design leverages the similarity of individuals or companies near a specific threshold. The difference in outcomes between individuals just below the threshold (not receiving the program) and those just above (receiving the program) can be interpreted as the intervention's impact.

IV.B.-Training activities

Type	Title
Prácticas / Resolución de ejercicios	Practice 3. Econometric analysis using the difference-in-difference approach and providing evidence of causality about a topic proposed by the teacher
Prácticas / Resolución de ejercicios	Practice 1. Econometric analysis on the topics proposed by the teacher using the econometric software STATA
Prácticas / Resolución de ejercicios	Practice 2. Econometric analysis based on Chapter III and IV using STATA about a topic related to economics of education



V.-Student workload	
Theoretical sessions	20
Resolution of exercises, problems, case studies, etc.	35
Practical sessions in experimental, technological and clinical laboratories, fieldwork, etc.	0
Tests and/or exams	5
Academic tutorials	30
Related activities: conferences, seminars, etc.	18
Preparation of theoretical sessions and self-study	30
Preparation of practical tasks, exercises, case studies, projects, etc.	42
Preparation for tests and/or exams	0
Total student workload	180

VI.-Methodology and academic programme		
Type	Period	Content
Theoretical sessions	Week 1 to Week 1	Chapter I & 2
Practical sessions	Week 2 to Week 5	Practice Chapter II
Theoretical sessions	Week 6 to Week 6	Chapter III
Practical sessions	Week 7 to Week 10	Practice Chapter III
Theoretical sessions	Week 11 to Week 11	Chapter IV
Theoretical sessions	Week 12 to Week 12	Chapter V
Practical sessions	Week 13 to Week 15	Practice Chapter V
Academic tutorials	Week 1 to Week 15	An individualized follow-up will be done of the student through the virtual classroom, email and video conferencing
Resolution of exercises, problems, case studies	Week 1 to Week 1	Econometric software Stata 17 for student use on myapps. Stata 17 is the latest version of the most widely used econometric software in Spain and internationally.



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

Continuous ordinary assessment:

The distribution and characteristics of the assessment tests are those described below. Only in exceptional case and for special reasons may the teacher add changes to the Guide. These changes will require the prior consultation with the Subject Head and the prior and explicit authorisation of the Degree Programme Coordinator, who will notify the Vice-Rector's office in charge of Academic Affairs of the modifications made. In any case, the changes proposed must take into account the stipulations of the verified report. In order for these changes to take effect, they must be duly communicated at the start of the course to the students using Aula Virtual.

The combination of activities that are not re-assessable cannot exceed 50% of the subject grade and, in general, cannot have a minimum grade (except for the case of laboratory or clinical work placements, where duly justified), and tests which exceed 60% of the subject weighting cannot be added.

Extraordinary assessment: Students who do not manage to pass the ordinary assessment, or who did not attend, will be subject to completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are re-assessable.

Description of the tests for assessment and their weights.

Activity	Retake in Extraordinary Evaluation	Weight	Week	Content
Practice 1	Yes	16%	Week 5	Practice 1
Practice 2	Yes	17%	Week 10	Practice 2
Practice 3	Yes	17%	Week 15	Practice 3
Examination	Yes	50%	Ordinary Exam	All contents

•The final exam and the practices can be re-evaluated in the extraordinary call.

Given the characteristics of the course and the early examination session (evaluación adelantada), the evaluation of any student requesting it will be carried out through an in-person theoretical-practical exam covering all the course content.

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

J.D. Angrist and J.S. Pischke, Mostly Harmless Econometrics: An Empiricist's Companion, Princeton University Press, 2009
J.D. Angrist and J.S. Pischke, Mastering 'Metrics: The Path from Cause to Effect, Princeton University Press, 2015.

Consultation bibliography

IX.-Professors

Name and surname	ISMAEL SANZ LABRADOR
E-mail address	ismael.sanz@urjc.es
Department	Economía Aplicada I e Historia e Instituciones Económicas
Campus	Madrid - Quintana
Category	Catedrático/a de Universidad
Academic degree	Doctor
Person responsible for the subject	Yes
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	4
Number of sexennia	4
No. of positive evaluations by Docencia	1
Name and surname	LUIS EDUARDO PIRES JIMÉNEZ
E-mail address	luis.pires@urjc.es
Department	Economía Aplicada I e Historia e Instituciones Económicas
Campus	Madrid - Quintana
Category	Titular de Universidad
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	6
Number of sexennia	3



No. of positive evaluations by Docentia	4

