



## IDENTIFYING DATA

### Econometrics I

Subject	Econometrics I			
Code	V03G100V01501			
Study programme	Grado en Economía			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language	Spanish English			
Department				
Coordinator	Álvarez García, María Begoña			
Lecturers	Álvarez García, María Begoña			
E-mail	alvarez@uvigo.es			
Web				
General description	This course is an introduction to multiple regression methods for analyzing data in economics and related fields. Students learn how to conduct empirical studies, as well as how to analyze and interpret results from other empirical works.			

## Skills

Code	
C1	Understand the basic mathematical tools required to formalize economic behavior.
C10	Ability to use technical tools to formulate simple models concerning economic variables.
D1	Respect civic and ethical values. Strong commitment to work ethic.
D5	Skills to make coherent and intelligible statements both in oral and written form.
D7	Promote critical and self-critical thinking.

## Learning outcomes

Expected results from this subject	Training and Learning Results	
Understand basic econometric tools from a theoretical and applied point of view.	C1	
Use of basic tools and procedures to quantify relationships between economic variables.	C1 C10	
Ability to use econometric tools for solving economic problems.	C1 C10	D1 D7
Develop skills to argue and obtain conclusions from empirical evidence.		D5 D7

## Contents

Topic	
TOPIC 1: Empirical questions and the problem of causal inference	<ul style="list-style-type: none"> <li>- Types of empirical questions and examples.</li> <li>- The problem of causal inference.</li> <li>- Methods for estimating causal effects.</li> </ul>
TOPIC 2: Linear regression model (I)	<ul style="list-style-type: none"> <li>- Selection on observables.</li> <li>- Linear regression model: specification.</li> <li>- Ordinary Least Squares estimation.</li> <li>- Interpretation of estimates: when do we identify a causal effect?</li> </ul>
TOPIC 3: Linear regression model (II)	<ul style="list-style-type: none"> <li>- Goodness of fit.</li> <li>- The random component of the Ordinary Least Squares estimator.</li> <li>- Assumptions of the regression model.</li> <li>- Precision of the estimates.</li> <li>- Properties of the Ordinary Least Squares estimator.</li> </ul>

TOPIC 4: Linear regression model (III)	<ul style="list-style-type: none"> <li>- Obtaining additional information from the parameter estimates: changes of scale of the variables; elasticities; Beta coefficients.</li> <li>- Non-linearities between the dependent variable and the explanatory variables of the model.</li> </ul>
TOPIC 5: Inference in the linear regression model	<ul style="list-style-type: none"> <li>- Assumption of normality.</li> <li>- Hypothesis testing on a single parameter.</li> <li>- Confidence intervals.</li> <li>- Contrasts of multiple restrictions on the parameters.</li> </ul>
TOPIC 6: Dummy variables	<ul style="list-style-type: none"> <li>- A single independent dummy variable.</li> <li>- Dummy variables for multiple categories</li> <li>- Interactions involving dummy variables.</li> </ul>
TOPIC 7: Specification and data problems in regression analysis	<ul style="list-style-type: none"> <li>- Consequences of misspecification of the functional form.</li> <li>- Omission of relevant variables.</li> <li>- Inclusion of irrelevant variables.</li> <li>- Multicollinearity</li> </ul>
TOPIC 8: Heteroscedasticity	<ul style="list-style-type: none"> <li>- Detection</li> <li>- Consequences</li> <li>- Solutions</li> </ul>
TOPIC 9: Correlation of error terms across observations	<ul style="list-style-type: none"> <li>- Detection</li> <li>- Consequences</li> <li>- Solution</li> </ul>
TOPIC 10: Endogeneity	<ul style="list-style-type: none"> <li>- Causes of endogeneity: omitted variable bias, measurement error in explanatory variables, bidirectional causality.</li> <li>- Instrumental variables estimation.</li> </ul>

### Planning

	Class hours	Hours outside the classroom	Total hours
Practices through ICT	20	30	50
Lecturing	28	40	68
Objective questions exam	1	15	16
Objective questions exam	1	15	16

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

### Methodologies

	Description
Practices through ICT	Computer practices are designed to train students to explore a dataset, write code to analyze relationships and to test hypotheses about some economic phenomenon. The course requires use of GRET, a free econometric software.
Lecturing	Lectures will develop the concepts and methodologies of the subject.

### Personalized assistance

Methodologies	Description
Lecturing	Students will be able to solve doubts in personal tutorials that will be arranged in advance by email (alvarez@uvigo.es). They may take place in person at office 337 or through Campus Remoto (Virtual office 82 - Student's password: 337-BegoñaAlvarez).
Practices through ICT	Supervision of students' work on the computer-oriented exercises in lab sessions.

Tests	Description
Objective questions exam	Students may contact the lecturer during the exam preparation if some issues are still unclear. All enquiries about the subject material should be made in personal tutorials that will be arranged in advance by email (alvarez@uvigo.es). They may take place in person at office 337 or through Campus Remoto (Virtual office 82 - Student's password: 337-BegoñaAlvarez).
Objective questions exam	Students may contact the lecturer during the exam preparation if some issues are still unclear. All enquiries about the subject material should be made in personal tutorials that will be arranged in advance by email (alvarez@uvigo.es). They may take place in person at office 337 or through Campus Remoto (Virtual office 82 - Student's password: 337-BegoñaAlvarez).

### Assessment

Description	Qualification	Training and Learning Results

Practices through ICT	Exercises with real-world databases. The econometric package GRETL will be used in the course. Students following continuous assessment must attend all practical sessions (except for justified reasons). In some sessions, students must hand in their work.	30	C1 C10	D1 D5 D7
Objective questions exam	Exam. Questions will require interpretation of computer output in addition to theoretical topics.	35	C1 C10	D1 D5 D7
Objective questions exam	Exam. Questions will require interpretation of computer output in addition to theoretical topics.	35	C1 C10	D1 D5 D7

### Other comments on the Evaluation

All students are entitled to two examination calls:

- Ordinary call, in the teaching semester.
- Extraordinary call, in June/July

Students may choose between two types of assessment procedures:

**1. Continuous assessment:** the final grade will be the weighted average of the marks corresponding to the practical work (30%) and two mid-term exams (35% each).

- If the student does not achieve a mark of 5 points or higher, he/she may waive the continuous assessment mark and take the final exam, which will account for 100% of his/her final mark. In this case, the mark will be equal to the weighted sum of the mark for the practical (30%) and the final exam (70%). This same criterion will be applied in the extraordinary exam (June/July).

**2. Final exam:** 100% of the final mark is obtained through a final exam.

\* Only for Spanish students: The assessment in the "Convocatoria Fin de Carrera" will be through final exam (100%).

Exams schedules are available at: <http://fccee.uvigo.es>

### Sources of information

#### Basic Bibliography

Wooldridge, JM, **Introducción a la Econometría. Un enfoque moderno**, Cengage Learning, 2016 (o anteriores)

Wooldridge, JM, **Introductory Econometrics. A Modern Approach**, 7th, South-Western College Publishing, 2019 (o anteriores)

Stock, JH and Watson, MW, **Introduction to econometrics**, 3th, Pearson, 2015

Dougherty, C, **Introduction to econometrics**, 5th, Oxford University Press, 2016

#### Complementary Bibliography

Fernández-Jardón, C. M, Verdugo, V. Cal, I., **Econometría Estática Aplicada.**, 1, Torculo, 1997

Greene, W.H. ., **Análisis Econométrico**, Prentice-Hall, 1998

Novalés, A., **Econometría.**, 5, McGraw-Hill., 2010

Verdugo, M.V., Cal, I., **Guía De Introducción A La Econometría Utilizando Gretl**, Eumed, 2014

### Recommendations

#### Subjects that continue the syllabus

Econometrics II/V03G100V01601

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

Statistics: Statistics I/V03G100V01205

Statistics II/V03G100V01403