



UNIVERSIDAD DE LAS PALMAS  
DE GRAN CANARIA

GUÍA DOCENTE

CURSO: 2019/20

**40731 - ECONOMETRÍA APLICADA  
(INGLÉS)**

**CENTRO:** 151 - Facultad de Economía, Empresa y Turismo  
**TITULACIÓN:** 4007 - Grado en Economía  
**ASIGNATURA:** 40731 - ECONOMETRÍA APLICADA (INGLÉS)  
**CÓDIGO ULPGC:** 40731      **CÓDIGO UNESCO:** 530200  
**MÓDULO:** MÉTODOS CUANTITATIVOS      **MATERIA:**      **TIPO:** Obligatoria  
**CRÉDITOS ECTS:** 6      **CURSO:** 4      **SEMESTRE:** 1º semestre  
**LENGUA DE IMPARTICIÓN (Especificar créditos de cada lengua)**  
**ESPAÑOL:** 0      **INGLÉS:** 6

**SUMMARY**

Nowadays an economist needs technical skills and communication skills, particularly in English. This course will contribute to both general objectives.

At the end of the course, students will be able to read, interpret and discuss a scientific document that contains an econometric study applied to the real world, using English as the language in communication.

The technical skills include regression models for limited dependent variable, discrete choice models, duration models, simultaneous equation models and panel data methods.

The objectives of the course are:

1. Provide students with the skills to understand and use in practice econometric models designed to cross-section microeconomic data and panel (longitudinal) data, as well as simultaneous equations models
- 2.- Training in the application of these models: choose the appropriate data, and work with them to answer research questions of applied economics to the behavior of economic agents
- 3.- Training for independent learning of new knowledge and techniques.
- 4.- Training for access, with reasonable likelihood of success, to subsequent studies at graduate and specialized level

The expected results are the following:

Read, interpret and discuss a scientific document containing an econometric application applied to the real world, using English as the language of communication. Associated competences: CN1, CN2, CN3, CN4, CN5, CG1, CG3, CG4, CG5, CG5, CG6, CG7, CE3, CE4, CE5, CE8, CE10, CE11, CE12, CEM3, CEM14, CEM18.

Know and apply the regression models for limited dependent variable, the discrete choice models, simultaneous equations models and methods panel data in order to analyze and propose alternatives to economic reality. Associated competences: CN2, CN3, CN4, CG1, CG3, CG4, CG5, CG5, CG6, CG7, CE1, CE3, CE4, CE5, CE8, CE10, CE11, CE12, CEM3, CEM4, CEM14, CEM18, CEM25.

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## REQUISITOS PREVIOS

Recommended topics: Statistics at introductory level; a basic course of Econometrics: multiple regression model for continuous variables; generalized methods for estimating models with autocorrelation/heteroschedasticity.

## Plan de Enseñanza (Plan de trabajo del profesorado)

### Contribución de la asignatura al perfil profesional:

Nowadays an economist needs technical skills and communication skills, particularly in English. This course will contribute to both general objectives.


At the end of the course, students will be able to read, interpret and discuss a scientific document that contains an econometric application applied to the real world, using English as the language in communication.

The technical skills include regression models for limited dependent variable, discrete choice models, duration models, simultaneous equation models and panel data methods

### Competencias que tiene asignadas:

According to the Guia Docente, the course will contribute to the following competences :

- CN1. Comunicarse de forma adecuada y respetuosa con diferentes audiencias (clientes, colaboradores, promotores, agentes sociales, etc.), utilizando los soportes y vías de comunicación más apropiados (especialmente las nuevas tecnologías de la información y la comunicación) de modo que pueda llegar a comprender los intereses, necesidades y preocupaciones de las personas y organizaciones, así como expresar claramente el sentido de la misión que tiene encomendada y la forma en que puede contribuir, con sus competencias y conocimientos profesionales, a la satisfacción de esos intereses, necesidades y preocupaciones.
- CN2. Cooperar con otras personas y organizaciones en la realización eficaz de funciones y tareas propias de su perfil profesional, desarrollando una actitud reflexiva sobre sus propias competencias y conocimientos profesionales, y una actitud comprensiva y empática hacia las competencias y conocimientos de otros profesionales.
- CN3. Contribuir a la mejora continua de su profesión, así como de las organizaciones en las que desarrolla sus prácticas a través de la participación activa en procesos de investigación, desarrollo e innovación.
- CN4. Comprometerse activamente en el desarrollo de prácticas profesionales respetuosas con los derechos humanos, así como con las normas éticas propias de su ámbito profesional para generar confianza en los beneficiarios de su profesión y obtener la legitimidad y la autoridad que la sociedad le reconoce.
- CN5. Participar activamente en la integración multicultural que favorezca el pleno desarrollo humano, la convivencia y la justicia social.
- CG1. Usar habitualmente la tecnología de la información y las comunicaciones en todo su desempeño profesional.
- CG3. Aplicar al análisis de los problemas criterios profesionales basados en el manejo de instrumentos técnicos.
- CG4. Comunicarse con fluidez en su entorno y trabajar en equipo.
- CG5. Analizar los problemas con razonamiento crítico, sin prejuicios, con precisión y rigor.
- CG6. Defender un punto de vista, mostrando y apreciando las bases de otros puntos de vista discrepantes.
- CG7. Capacidad de síntesis.
- CE1. Contribuir a la buena gestión de la asignación de recursos tanto en el ámbito privado como

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en el público.

- CE3. Aportar racionalidad al análisis y a la descripción de cualquier aspecto de la realidad económica.
- CE4. Evaluar consecuencias de distintas alternativas de acción y seleccionar las mejores, dados los objetivos.
- CE5. Emitir informes de asesoramiento sobre situaciones concretas de la economía (internacional, nacional o regional) o de sectores de la misma.
- CE8. Identificar las fuentes de información económica relevante y su contenido.
- CE10. Extraer e interpretar información relevante difícil de reconocer por no profesionales de la economía.
- CE11. Analizar la realidad económica utilizando el marco teórico que se les presenta, siendo conscientes de su potencialidad y de sus limitaciones.
- CE12. Contextualizar los problemas económicos mediante la utilización de modelos formales, sabiendo incorporar a los modelos básicos extensiones o variaciones en los supuestos de partida que respeten las hipótesis básicas establecidas y siendo conscientes de su potencialidad y de sus limitaciones.
- CEM3. Afianzar el uso del lenguaje simbólico, destacando sus ventajas a la hora de realizar una representación clara y concisa de la información así como en la presentación de resultados.
- CEM4. Definir un marco conceptual para la formalización y desarrollo de procedimientos teóricos de ayuda a la toma de decisiones.
- CEM14. Proveer al estudiante de herramientas meteorológicas esenciales para trabajar con datos económicos, realizando estimaciones, contrastes de modelos econométricos, predicción y evaluación de políticas económicas.
- CEM18. Comprender los métodos de regresión lineal en sistemas de ecuaciones y modelos de panel de datos, conocer los problemas que pueden surgir y aprender a resolverlos. Comprender los métodos de regresión con variables endógenas discretas y continuas limitadas en su rango de variación, conocer los problemas que pueden surgir y aprender a resolverlos.
- CEM25. Afianzar el uso del lenguaje informático.


## Objetivos:

1. Provide students with the skills to understand and use in practice econometric models designed to cross-section microeconomic data and panel (longitudinal) data, as well as simultaneous equations models
- 2.- Training in the application of these models: choose the appropriate data, and work with them to answer research questions of applied economics to the behavior of economic agents
- 3.- Training for independent learning of new knowledge and techniques.
- 4.- Training for access, with reasonable likelihood of success, to subsequent studies at graduate and specialized level

According to these objectives, the course has two parts:

In the first part: micro-econometric models with cross-sectional and panel data, we will study qualitative dependent variable models, limited dependent variable models (dependent variable is censored / truncated) and duration models. Panel data models and models for hierarchical data. A fundamental aspect of learning is reading survey microdata (INE or other organism), and prepare the database to apply an econometric model.

In the second part we study the multi-equation econometric models: specification, identification, estimation, and tests.

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## Contenidos:

Modelos de elección discreta y de variable dependiente limitada. Modelos de datos de panel. Modelos de ecuaciones simultáneas.

Estos contenidos se desarrollan en los siguientes temas:

### PART I. MICROECONOMETRICS

#### LESSON 1. MICROECONOMETRICS: AN INTRODUCTION

1. Concept and types of micro-econometric models
2. Areas of application. Examples
- 3 Theoretical Foundations 'microeconometrics': the rational choice theory
4. Introduction to specific econometric software and its use

#### LESSON 2. QUALITATIVE RESPONSE MODELS

1. Linear probability models, probit and logit: specification
2. Binomial models: estimation and tests
3. Measures of goodness of fit, specification tests and model choice
4. Multiple choice models. Multinomial logit models and conditional logit models. Models for ordinal dependent variable
5. Looking at the future. Progress and extensions of discrete choice models
6. Applications with specific econometric software

#### LESSON 3. REGRESSION MODELS WITH LIMITED DEPENDENT VARIABLE

1. Introduction
2. Tobit Analysis. Specification, estimation and tests
3. Truncation. Truncated Distributions. The truncated regression model. Specification and estimation
4. Censored data. The censored normal distribution. The censored regression model.
6. Self selection and endogenous selection. The Heckman model and other models
7. Count data models. The Poisson model and extensions
7. Introduction to duration models and their applications
8. Applications with specific econometric software

#### LESSON 4. INTRODUCTION TO THE USE OF ECONOMETRIC MODELS FOR POLICY EVALUATION

1. Introduction to policy evaluation. The importance of design
2. Independent cross sections. Design and use of Differences in Differences estimation
3. Matching methods
4. Regression discontinuity
5. Applications with specific econometric software


#### LESSON 5. INTRODUCTION TO REGRESSION MODELS FOR PANEL DATA AND HIERARCHICAL DATA

1. Introduction to panel data
2. Models of static panel data estimation. Fixed effects and random effects
3. Hierarchical data and multilevel regression models. Specification and estimation
4. Applications with specific econometric software

### PART II. Multi-equation models

#### Lesson 6. SPECIFICATION AND IDENTIFICATION OF A GENERAL LINEAR MODEL OF

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## SIMULTANEOUS EQUATIONS

1. Structural and reduced form of a SEM. The particular case of the recursive model
2. General notation
3. Identification: intuitive approach and formal approach. Observationally equivalent structures
4. Conditions for identification with constraints on parameters equation by equation: order and rank conditions
5. More general cases: constraints affecting more than one equation, constraints on the Covariance matrix of errors

## LESSON 7. INTRODUCTION TO ESTIMATION METHODS FOR SIMULTANEOUS EQUATION SYSTEMS

1. Estimation of the structural form of the model by direct least squares. Limitations
2. Estimating a recursive model by direct least squares and maximum likelihood. Equivalence of the estimators. Properties
3. Indirect least squares estimation of a model exactly identified. Properties of estimators
4. Estimation by Instrumental Variables. Properties. Applications and examples in various areas
5. The method of Two-Stage Least Squares (2SLS). Alternative interpretations
6. The method of Limited Information Maximum Likelihood (LIML)
7. Introduction to 3SLS and to other full information methods Full Information Maximum Likelihood (FIML). Generalized method of moments (GMM)
9. Applications with specific econometric software

### Metodología:

We will combine theoretical and practical training; individual and group work.

Classroom teaching to the full group of students (presentation by the teacher with eventual interventions of students. Comments are welcome)

Practice classroom: practice sessions with computers and specific econometric software

The specific categories are:

- Lecture
- Problems and cases.
- Classroom practices.
- Individual or group work, supervised by the teacher.
- Oral presentation by students.
- Virtual (Activities through virtual platforms, websites, etc..).
- Tutoring.
- Other: active learning in computer rooms

Mentoring, individual and in groups


Along the course, students will perform activities of different kinds such as:

Classroom teaching: student's attendance and participation

Oral presentation of individual and/or group work

Tests in class

Sets of problems and activities to be performed and uploaded to the virtual campus

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## Evaluación:

### Criterios de evaluación

1. To understand and know the main concepts and formal developments included in the textbook of the course (Wooldridge, selected chapters, see bibliography) so that students are able to answer specific questions related to those contents (O1,O2,O3,O4)
2. To interpret correctly empirical econometric estimated models (O1,O2,O3,O4)
3. To be able to apply econometric models to a real problem (O1,O2,O3,O4)
4. To enhance oral and written communication abilities (O1,O2,O3,O4)
5. To interact with others in a team joint work, by doing a course project (O1,O2,O3,O4)

For each task (lesson or topic):

- To know the fundamentals of the method/model, to understand the main concepts and to be able to proof the main findings
- To be able to use the appropriate model with appropriate data
- To be able to manage information on micro data: to prepare databases for modeling (missing values treatment, changes of variables, etc)
- To be able to read a paper using the model and understand the design, process and results of the study
- To be able to communicate (oral and written) in English on topics of applying econometrics in practice

### Sistemas de evaluación

a) Written exam of theoretical and practical content. It will consist of questions of theory concepts, proofs, and exercises requiring short calculation as well as and interpretation of results of applied studies (published papers). It includes also a practical exam with specific econometric software in which the student should prove his/her ability to apply the models with that specific software.  
Score: 60% of the final grade. To pass the course you must pass the exam, and you must get at least 40% of the maximum grade in the specific computer-based part of the exam.

b) Group Project: application of the models

Mandatory. Can be done in groups (maximum 3 people). Consist of the application of the models studied to a real problem with real cross-sectional od longitudinal data

Projects will be performed throughout the course and will be presented (in writing and orally) by appointment before the final exam

Score: 20% of the final grade


c) Course work, with continuous assessment throughout the course (class participation, online tests, activities, etc.): 20% of the final grade

The number of tests and course activities that will be included in the continuous evaluation will depend on the course dynamics.

Important notice: ninguna de las actividades descritas en este proyecto tiene la consideración de "Prácticas" a los efectos previstos en el art. 14 del Reglamento de Aprendizaje de la ULPGC.

THE GRADES B) AND C) WILL BE VALID FOR THE ORDINARY AND EXTRAORDINARY CALLS OF THE CURRENT ACADEMIC COURSE. AFTERWARDS STUDENTS WOULD HAVE TO RESTART A NEW COURSE (COURSE WORK AND GROUP PROJECT)

IF A STUDENT DOES NOT PARTICIPATE REGULARLY IN THE COURSE, HE/SHE WILL

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HAVE ONLY THE GRADES OF WRITTEN EXAM AND COURSE PROJECT, THEREFORE THE MAXIMUM ATTAINABLE GRADE WILL BE 8 OVER 10 IN THAT SPECIFIC CASE.

IF A STUDENT FOLLOWS REGULARLY THE COURSE BUT HE/SHE DOES NOT PARTICIPATE IN THE FINAL EXAM AND/OR SHE/HE DOES NOT PASS THE COURSE PROJECT, THE FINAL GRADE WILL BE: NO PRESENTADO

Los estudiantes que participan en programas de movilidad y que se encuentren en la situación contemplada en el art. 51 del Reglamento de Movilidad de estudios con reconocimiento académico de la ULPGC, esto es, con alguna de las asignaturas de su acuerdo académico que no hubieran sido superadas en destino o estuvieran calificadas como no presentadas, podrán presentarse en las convocatorias extraordinaria o especial optando al 100% de la calificación (art. 26 Reglamento de Evaluación de los resultados de aprendizaje y de las competencias adquiridas por el alumnado de la ULPGC).

Siguiendo lo indicado en los artículos 16 y 16 Bis del Reglamento de Evaluación de los resultados de aprendizaje, aquellos alumnos en 5ª, 6ª y 7ª convocatoria que hayan solicitado, por escrito, ser excluidos de la evaluación continua serán evaluados por un tribunal (art. 12.3 del Reglamento de Evaluación de los resultados de aprendizaje), debiendo suponer dicho examen el 100% de la calificación de la asignatura.

#### Criterios de calificación

The grading system is expressed by numerical rating, in accordance with the provisions of Article 5 of Royal Decree 1125/2003 of 5 September (BOE September 18), which establishes the European credit system and the system of scores for the official university qualifications valid throughout the national territory.

Grades are awarded according to their score on base 10:

- 0.0 to 4.9 fail (S)
- 5.0 to 6.9 approved (A)
- 7.0 to 8.9 remarkable (N)
- 9.0-10.0 outstanding (SB)
- honors from 9.6 to 10.0 (MH)

The student must get 5 out of 10 to pass the course.

### Plan de Aprendizaje (Plan de trabajo de cada estudiante)


#### Tareas y actividades que realizará según distintos contextos profesionales (científico, profesional, institucional, social)

Theory and practice with applied econometric models. Useful for academic achievement and professional training.

More specifically:

- Solving problems and case studies
- Classroom practices in the computer room with econometric software
- Exercises and practices through the Virtual Classroom
- Group work of application of a model to real data

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**Temporalización semanal de tareas y actividades (distribución de tiempos en distintas actividades y en presencialidad - no presencialidad)**

This is a regular course: 15 weeks

The following planning is an estimation or approximation. Depending on the dynamics of the course it might be changed.

Week 1. Lesson 1 theory and practice: looking for micro data. Organizing the file

Weeks 2-4 Binomial and multinomial choice models. Theory and practice.

Practices in classroom

Homework: activities and tests

Tests in the classroom

Weeks 5-7 Truncated., censored , tobit, Poisson, Heckman and duration models. Theory and practice

Practices in classroom

Homework: activities and tests

Tests in the classroom

Week 8. Practicing with models and introduction to the group work.

Weeks 9-11. DiD models. Policy evaluation, Panel data and hierarchical models. Theory and practice

Practices in classroom

Homework: activities and tests

Tests in the classroom

Week 12. Simultaneous Equation models (I) Identification: theory and practice

Homework: exercises and tests

Tests in the classroom

Practice in class (without computer)

Week 13. Simultaneous equation models: estimation and test

Theory and practice

Practices in classroom

Homework: activities and tests

Tests in the classroom


Applied econometrics in practice (I)

Weeks 14-15 Applied econometrics in practice (II)

Case studies: general discussion and specific presentations by students

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WEEKS 1-8:

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EACH WEEK, AVERAGE OF 6 HOURS OF FACE-TO-FACE SESSION OF THEORY AND 2 HOURS OF FACE-TO-FACE PRACTICE

DISTANCE LEARNING: WEEKS 1-8: 12 HOURS PER WEEK

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(Provisional) schedule

Total hours face-to-face: theory (TH): 45  
Total hours face-to-face: practice PH): 15  
Total hours of tutored classes: (HCT): 0  
Distance learning hours total: 90  
Tutored work: (HTT):30  
Independent activity: (HAI): 60

distribution by weeks

Week (W) TH PH HCT HTT HAI Lesson(\*)

W1 : 6 2 0 0 12 1-2

W2 : 6 2 0 0 12 2

W3 : 6 2 0 0 12 3

W4 : 6 2 0 0 12 4\*

W5 : 6 2 0 0 12 4\*

W6 : 6 2 0 0 12 5-6

W7 : 6 2 0 0 12 7\*

W8 : 3 1 0 0 6 1-7\*

(\*) P= Practice with the group work

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Total: 45 15 30 0 30 60


### Recursos que tendrá que utilizar adecuadamente en cada uno de los contextos profesionales.

Exercises (without computer)  
Cases reading and discussion  
Use of specific econometric software (Stata or similar)  
Classroom Material  
Textbooks

### Resultados de aprendizaje que tendrá que alcanzar al finalizar las distintas tareas.

Read, interpret and discuss a scientific document containing an econometric application applied to the real world, using English as the language of communication. Associated competences: CN1, CN2, CN3, CN4, CN5, CG1, CG3, CG4, CG5, CG5, CG6, CG7, CE3, CE4, CE5, CE8, CE10, CE11, CE12, CEM3, CEM14, CEM18.

Know and apply the regression models for limited dependent variable, the discrete choice models, simultaneous equations models and methods panel data in order to analyze and propose alternatives to economic reality. Associated competences: CN2, CN3, CN4, CG1, CG3, CG4, CG5, CG5, CG6, CG7, CE1, CE3, CE4, CE5, CE8, CE10, CE11, CE12, CEM3, CEM4, CEM14, CEM18, CEM25.

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## Plan Tutorial

### Atención presencial individualizada (incluir las acciones dirigidas a estudiantes en 5ª, 6ª y 7ª convocatoria)

In office hours:  
Wednesdays: 17:00-20:00 hours  
Thursdays: 10:00-13:00 hours

Students can schedule an appointment through the campus virtual (tutorías) or by e-mail to [beatriz.lopezvalcarcel@ulpgc.es](mailto:beatriz.lopezvalcarcel@ulpgc.es)

Los estudiantes que se encuentren en 5ª, 6ª y 7ª convocatoria y hayan renunciado a la evaluación continua en los plazos establecidos al efecto, tienen derecho a un plan de acción tutorial en los términos recogidos en el Plan de Acción Tutorial de la Facultad de Economía, Empresa y Turismo disponible en la página web de la Facultad en el apartado Estudiantes.

### Atención presencial a grupos de trabajo

By appointment

### Atención telefónica

In office hours: 928 452821

### Atención virtual (on-line)

By e-mail to [beatriz.lopezvalcarcel@ulpgc.es](mailto:beatriz.lopezvalcarcel@ulpgc.es)  
In any time/day (24/7)

### Datos identificativos del profesorado que la imparte.


### Datos identificativos del profesorado que la imparte

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### Bibliografía

#### [1 Básico] Introductory econometrics: a modern approach /

*Jeffrey M. Wooldridge.*  
*South Western Cengage Learning., New York : (2013) - (5th ed.)*  
9781111534394

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