Information about the subject

Degree: Bachelor of Science Degree in Business Administration and Management

Faculty: Faculty of Legal, Economic and Social Sciences

Code: 300402 **Name:** Econometrics

Credits: 6,00 **ECTS Year:** 4 **Semester:** 1

Module: Quantitative Methods

Subject Matter: Statistical and Econometric Methods **Type:** Compulsory

Field of knowledge: Ingeniería y Arquitectura

Department: Economics, Business Management, and Marketing

Type of learning: Classroom-based learning / Online

Languages in which it is taught: English, Spanish

Lecturer/-s:

304A	María Del Pilar Malagón Selma **(Profesor responsable)**	pilar.malagon@ucv.es
304B	María Del Pilar Malagón Selma **(Profesor responsable)**	pilar.malagon@ucv.es
305DA	María Del Pilar Malagón Selma **(Profesor responsable)**	pilar.malagon@ucv.es
CAOL	Alberto Sanz Cazorla **(Responsible Lecturer)**	alberto.sanz@ucv.es
CATT	Alberto Sanz Cazorla **(Responsible Lecturer)**	alberto.sanz@ucv.es
30GI4	María Del Pilar Malagón Selma **(Profesor responsable)**	pilar.malagon@ucv.es
30GI5	María Del Pilar Malagón Selma **(Profesor responsable)**	pilar.malagon@ucv.es

Module organization

Quantitative Methods

Subject Matter	ECTS	Subject	ECTS	Year/semester
Information Systems	12,00	Information Systems for Management I	6,00	1/2
		Information Systems for Management II	6,00	2/1
Mathematics	6,00	Mathematics for Economics and the Business	6,00	1/1
Statistical and Econometric Methods	12,00	Econometrics	6,00	4/1
		Statistical Inference	6,00	3/2
Statistics	6,00	Descriptive Statistics	6,00	2/1

Recommended knowledge

It is recommended to take Mathematics for Economics and Business, Descriptive Statistics, and Statistical Inference before Econometrics. In particular, **it is considered essential and indispensable** to have acquired the prior knowledge corresponding to the courses Descriptive Statistics and Statistical Inference.

Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

R1 To consult, based on the problem proposed, the most important information sources and make an adequate analysis form the data obtained.

R2 Given a problem already formalized, to be able to apply the techniques learned to solve it and be able to decide whether or not you can obtain a solution or not, so that, in the second case, you can approximate the solutions.
To be able to decide whether the solution obtained is reasonable, according to the context in which the problem is formulated.

R3 To incorporate new cognitive schemes or models and new ways of interpreting reality in order to present solutions for problems or situations using their experience in other similar ones. To apply standard solutions being able to make a critical assessment of them a posteriori to build econometric models. To know how to detect and correct the most common problems in regression models.

R4 To express opinions clearly and precisely and know how to ask control and follow-up questions. Given a "verbalized" problem, be able to translate it into a formal language, and identify economic facts based on their numerical substrate and be able to establish basic relationships.

R5 To handle office packages and especially be able to use the Excel formulation fluently. To be able to handle some of the usual computer tools, so that he/she can provide numerical approximations to the problems posed. To use and interpret the results of a computer program to handle the various econometric techniques, in order to overcome the obstacle of complex calculations associated with them.

R6 To calculate, both by hand and using computer applications, the most important descriptive parameters of a data sample, as well as to build from them the most appropriate graphic representations. To calculate (by hand and with the help of computer applications) the equation of a regression line, interpret its parameters correctly, use it to make predictions, and calculate and interpret the residues of the observations.

R7 To set up systems or practices for collecting information on a regular basis in the company. Simultaneously manage several complex projects, permanently establishing mechanisms for coordinating and controlling the information on the processes in progress.

R8 To express the conclusions of an econometric study in understandable terms.

Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC		Weighting			
		1	2	3	4
CB1	That students have demonstrated knowledge and understanding in an area of study that is at the core of general secondary education, and is often at a level that, while supported by advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study.	x			
CB2	That students know how to apply their knowledge to their work or vocation in a professional way and possess the skills that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.	x			
CB3	That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include reflection on relevant social, scientific or ethical issues.	x			
CB4	That students can convey information, ideas, problems and solutions to both specialized and non-specialized audiences.	x			
CB5	That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.	x			

GENERAL		Weighting			
		1	2	3	4
CG0	Speaking well in public.	x			
CG1	Capacity of analysis and synthesis.				x
CG3	Capacity to apply knowledge into practice.				x
CG5	Oral and written communication.		x		

CG6	Use of ICTs			x	
CG7	Information management.				x
CG8	Orientation to problem-solving.				x
CG9	Decision-making orientation.			x	
CG11	Creativity and ability to generate new ideas.		x		
CG13	Ability to learn and research skills.				x
CG18	Ability to obtain, from the data, valuable information for decision making.	x			

SPECIFIC		Weighting			
		1	2	3	4
CE14	To understand the potential impact of aspects related to the macro- and microeconomic environment and its institutions on business organizations (e.g. the monetary and financial system, domestic markets)				x
CE15	Ability to obtain, from the data, valuable information for decision making.				x
CE17	Application of professional criteria to the analysis of business problems.	x			
CE18	Ability to integrate in any functional area of a company and develop different tasks related to its management.			x	

Assessment system for the acquisition of competencies and grading system

In-class teaching

Assessed learning outcomes	Granted percentage	Assessment method
R2, R3, R4, R5, R8	15,00%	Objective Tests
R1, R3, R4, R5, R6, R7, R8	25,00%	Conduct of Theory-Practice
R8	10,00%	Class attendance and participation
R2, R3, R8	50,00%	Final Exam

Observations

1) In order to pass the course, it will be a **necessary but not sufficient requirement** to obtain at least 5 points out of 10 in the **in-person theoretical exam** of the subject, in any of the official sittings: first, second, early sitting, or single assessment. If the student fails the in-person theoretical exam, the final weighted grade of the course cannot exceed 4.9 points out of 10.
2) In the **early sitting** and in the **single assessment**, in addition to the in-person theoretical exam, students must take an **in-person practical exam** consisting of the development of an econometric model using a computer, in addition to the theoretical exam.
3) In the **second sitting**, students who have not passed the course may request, in addition to the in-person theoretical exam, to take an **in-person practical exam** consisting of the development of an econometric model using a computer, in order to try to improve the grade corresponding to the 50% related to participation in objective tests, completion of theoretical-practical activities, and attendance and participation in class.
4) Students who do not achieve at least **80% attendance** at in-person sessions will not be eligible for assessment through continuous evaluation. In this case, **single assessment** will automatically apply, consisting of:

·The same theoretical exam as the rest of the students.

·An in-person practical exam consisting of the development of an econometric model using a computer, in addition to the in-person final evaluation.

·The final grade will be obtained by applying the following percentages: 50% theoretical exam and 50% practical exam. It is a necessary requirement to obtain at least 5 points out of 10 in the in-person theoretical exam in order to pass the subject. These criteria will apply both in the first and second sittings.

SINGLE ASSESSMENT

According to the **General Regulations on Assessment and Grading of Official Programs and Proprietary Degrees at UCV**, the single assessment system is linked to the impossibility of class attendance by students enrolled in a degree program. It is, therefore, an extraordinary and exceptional assessment system available to those students who, in a duly justified and accredited manner, cannot undergo the continuous assessment system, and who formally request it from the professor responsible for the course. The professor will expressly decide on the admission of the student's request for single assessment and will notify them of its acceptance or rejection .
If admitted, the student must complete:

·The same theoretical exam as the rest of the students.

·An in-person practical exam consisting of the development of an econometric model using a computer, in addition to the in-person final evaluation.

·The final grade will be obtained by applying the following percentages: 50% theoretical exam and 50% practical exam. **It is a necessary requirement to obtain at least 5 points out of 10 in the in-person theoretical exam in order to pass the subject**. These criteria will apply in the first and second sittings, as well as in the early sitting.

REGARDING AI

With respect to the use of artificial intelligence in general in continuous assessment activities and in final evaluation exams (theoretical and practical), **the use of AI will not be permitted**. However, its use will be allowed in specific cases for completing activities in which the professor has expressly authorised it, following the professor's guidelines on the type of appropriate and responsible use.

Students who fail to comply with these good practices, whether in continuous assessment activities or in final evaluation exams (theoretical and practical), will receive a **grade of 0 (CERO points)** in the corresponding exam or project.

Online teaching

Assessed learning outcomes	Granted percentage	Assessment method
R8	5,00%	Attendance and participation in the activities of synchronous communication
R1, R2, R3, R4, R5, R6, R7, R8	25,00%	Conduct of deliverables
R2, R4, R5, R6	15,00%	Regular evaluations through online questionnaires.
R8	5,00%	Participation in discussion forums
R2, R3, R4, R8	50,00%	Final on-site assessment.

Observations

1) In order to pass the course, it will be a **necessary but not sufficient requirement** to obtain at

least 5 points out of 10 in the **in-person theoretical exam** of the subject, in any of the official sittings: first, second, early sitting, or single assessment. If the student fails the in-person theoretical exam, the final weighted grade of the course cannot exceed 4.9 points out of 10.
2) In the **early sitting** and in the **single assessment**, in addition to the in-person theoretical exam, students must take an **in-person practical exam** consisting of the development of an econometric model using a computer, in addition to the theoretical exam.
3) In the **second sitting**, students who have not passed the course may request, in addition to the in-person theoretical exam, to take an **in-person practical exam** consisting of the development of an econometric model using a computer, in order to try to improve the grade corresponding to the 50% related to participation in synchronous communication activities, submission of deliverable assignments, periodic assessments through online quizzes, participation in discussion forums.
4) Students who do not achieve at least **80% attendance** at in-person sessions will not be eligible for assessment through continuous evaluation. In this case, **single assessment** will automatically apply, consisting of:

·The same theoretical exam as the rest of the students.

·An in-person practical exam consisting of the development of an econometric model using a computer, in addition to the in-person final evaluation.

·The final grade will be obtained by applying the following percentages: 50% theoretical exam and 50% practical exam. It is a necessary requirement to obtain at least 5 points out of 10 in the in-person theoretical exam in order to pass the subject. These criteria will apply both in the first and second sittings.

SINGLE ASSESSMENT

According to the **General Regulations on Assessment and Grading of Official Programs and Proprietary Degrees at UCV**, the single assessment system is linked to the impossibility of class attendance by students enrolled in a degree program. It is, therefore, an extraordinary and exceptional assessment system available to those students who, in a duly justified and accredited manner, cannot undergo the continuous assessment system, and who formally request it from the professor responsible for the course. The professor will expressly decide on the admission of the student's request for single assessment and will notify them of its acceptance or rejection .
If admitted, the student must complete:

·The same theoretical exam as the rest of the students.

·An in-person practical exam consisting of the development of an econometric model using a computer, in addition to the in-person final evaluation.

·The final grade will be obtained by applying the following percentages: 50% theoretical exam and 50% practical exam. **It is a necessary requirement to obtain at least 5 points out of 10 in the in-person theoretical exam in order to pass the subject**. These criteria will apply in the first and second sittings, as well as in the early sitting.

REGARDING AI

With respect to the use of artificial intelligence in general in continuous assessment activities and in final evaluation exams (theoretical and practical), **the use of AI will not be permitted**. However,

its use will be allowed in specific cases for completing activities in which the professor has expressly authorised it, following the professor's guidelines on the type of appropriate and responsible use.
Students who fail to comply with these good practices, whether in continuous assessment activities or in final evaluation exams (theoretical and practical), will receive a **grade of 0 (CERO points)** in the corresponding exam or project.

MENTION OF DISTINCTION:
The mention of "Honors" may be awarded to students who have obtained a grade equal to or greater than 9.0. Their number may not exceed five percent of the students enrolled in a group in the corresponding academic year, unless the number of students enrolled is lower.

Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

M1	Problem solving, commentaries, summaries to hand in periodically.
M3	Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge.
M5	Group work sessions supervised by the professor. Case studies, diagnostic tests, problems, field work, computer room, visits, data search, libraries, on-line, Internet, etc. Meaningful construction of knowledge through interaction and student activity.
M7	Supervised monographic sessions with shared participation.
M9	Application of multidisciplinary knowledge.
M11	Personalized and small group attention. Period of instruction and / or orientation conducted by a tutor with the objective of reviewing and discussing the materials and topics presented in classes, seminars, readings, conducting work, etc.
M13	Set of oral and/or written tests used in initial, formative or additive assessment of the student.
M14	Student study: Group Individual preparation of readings, essays, problem solving, seminars, papers, reports, etc. to be presented or submitted in theoretical lectures, practical and/or small-group tutoring sessions.

M16 Group preparation of readings, essays, problem solving, seminars, papers, reports, etc. to be presented or submitted in theoretical lectures, practical and/or small-group tutoring sessions.

M17 Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge.

M19 Groupwork sessions in the chat under supervision of the lecturer. Analysis of economic and business case studies, both real and fictitious, in order to build knowledge through the student's interaction and activity. Critical analysis of values and social commitment.

M21 Monographic sessions though the semester, which will be aimed at current aspects and applications of the subject.

M23 Set of written or oral tests used for the initial, formative or cumulative assessment of the student.

M25 Student study: Individual preparation of readings, essays, problem solving, seminars, papers, reports, etc., for their discussion or submission in electronic format.

M27 Individual support for the monitoring and orientation of the learning process. It will be carried out by a lecturer and will pursue the revision and discussion of the materials, topics, readings, tasks, etc.

M29 Group preparation of readings, essays, problem solving, seminars, papers, reports, etc., for their discussion or submission.

M31 Participation in discussion forums related to the subject under the supervision of the lecturer.

IN-CLASS LEARNING

IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
On-campus Class M3, M7, M9, M11	R2, R4, R8	22,50	0,90
Practical Class M3, M5, M7, M9, M11	R1, R2, R3, R4, R5, R6, R7, R8	15,00	0,60
Seminar M7	R2	4,50	0,18
Group Presentation of Papers M9, M13	R4, R8	6,00	0,24
Office Assistance M11, M14	R4, R8	6,00	0,24
Assessment M13	R2, R4, R6, R7, R8	6,00	0,24
TOTAL		**60,00**	**2,40**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Group Work M3, M5, M9, M11, M16	R1, R2, R3, R4, R5, R6, R8	30,00	1,20
Independent Work M14	R1, R2, R3, R4, R8	60,00	2,40
TOTAL		**90,00**	**3,60**

ON-LINE LEARNING

SYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Synchronous Virtual Session M3, M7, M9	R3, R4	4,00	0,16
Synchronous Vitual Practical Session M1, M17, M19, M31	R1, R2, R3, R4, R5, R6, R7, R8	4,00	0,16
Seminar and Synchronous Virtual Videoconference M21	R2	4,00	0,16
On-site or Synchronous Virtual Assesment M13	R2, R4, R5, R6, R7, R8	3,00	0,12
TOTAL		**15,00**	**0,60**

ASYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Individual Work M1, M25, M27	R1, R2, R3, R4, R5, R6, R8	60,00	2,40
Tutorial Support Sessions M27	R4, R8	5,00	0,20
Group Work M1, M25, M29	R1, R2, R3, R4, R5, R6, R8	10,00	0,40
Discussion Forum M19	R4, R8	10,00	0,40
Continuous Assessment Tasks M23, M25	R1, R2, R3, R4, R8	50,00	2,00
TOTAL		**135,00**	**5,40**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
Introduction to Econometrics	**Unit 0:** ·Course presentation ·Review of basic concepts covered in previous related courses and necessary for this subject **Unit 1:** ·Basic explanation of econometrics ·Introduction to linear regression **Introduction to Python programming and its most common uses**
Linear Regression – Dummy Variables	**Unit 2:** ·What is a dummy variable? ·How to include a dummy variable in a regression model ·Systematic definition of regression parameters in models with qualitative variables
Model Validation – Linear Regression	**Unit 3:** ·Diagnosis and validation of the assumptions of the multiple regression model ·Basic assumptions of the regression model: ·Linearity ·Normality ·Linear independence ·Independence of errors ·Homoscedasticity
Logistic Regression Models	**Unit 4:** ·Linear probability model ·Definition of a logistic regression model ·Evaluation of the logistic regression model

Introduction to Time Series	**Unit 5** ·What is a time series? ·Basic components of a time series ·Additive model ·Multiplicative model
Stochastic Processes	**Unit 6** ·What is a stochastic process? ·Key factors in stochastic processes ·Stationary processes ·Non-stationary processes ·Autocorrelation functions (ACF) ·Partial autocorrelation functions (PACF)
ARIMA Models	**Unit 7** ·Introduction to ARIMA models ·Components of ARIMA models ·ARIMA model proposal ·Stationary processes ·Non-stationary processes

Temporary organization of learning:

Block of content	Number of sessions	Hours
Introduction to Econometrics	4,50	9,00
Linear Regression – Dummy Variables	4,50	9,00
Model Validation – Linear Regression	4,50	9,00
Logistic Regression Models	3,00	6,00
Introduction to Time Series	4,50	9,00
Stochastic Processes	4,50	9,00
ARIMA Models	4,50	9,00

References

Ezequiel, J. U. (2019). Introduction to Econometrics. https://www.uv.es/uriel/manual/Introduction%20to%20Econometrics%2012-09-2019.pdf

Gujarati, D., & Porter, D. (2004). Introduction to Econometrics