

Degree programme	Type	Course
Business Administration	OB	2
Economics	OB	2

Contact lecturer

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Group languages

You can consult this information at the [end](#) of the document.

Prerequisites

It is highly recommended that the student has successfully completed *Mathematics I, II* and *Statistics I, II*. Having full command of the materials presented in these courses is essential to succeed in *Econometrics I*.

Objectives

Econometrics I presents basic tools for the empirical analysis of relationships between economic variables. The course begins with the simple regression model, already introduced in *Statistics II*, and continues with multiple regression, including both quantitative and qualitative regressors.

The goal of this course is for students to learn to extract information from economic data using basic regression analysis, being able to rigorously assess the advantages and limitations of this tool. Major emphasis shall be placed on understanding the intuition behind the general theoretical aspects of econometric analysis. Throughout the course numerous applications using real data and econometric software will be presented to help students learn to value the empirical applications of the tools introduced.

This course provides the fundamentals for the analysis of economic data that continues with the courses of *Econometrics II*.

Learning outcomes

Business Administration

- CM55 (Specify econometric models to respond to the problems that appear in the empirical study of some economic data.) Specify econometric models to respond to the problems that appear in the empirical study of some economic data.
- CM56 (Coordinate econometric work in multidisciplinary teams.) Coordinate econometric work in multidisciplinary teams.
- KM53 (Recognise confidence intervals and the significance of predictions.) Recognise confidence intervals and the significance of predictions.
- SM53 (Search for economic information from various sources: Databases, Internet, etc.) Search for economic information from various sources: Databases, Internet, etc.
- SM55 (Specify models, estimation methods, and inference.) Specify models, estimation methods, and inference.
- SM57 (Communicate the results of econometric analysis applied to economic and business data sources.) Communicate the results of econometric analysis applied to economic and business data sources.

Economics

- CM31 (Specify econometric models to respond to the problems that appear in the empirical study of some economic data.) Specify econometric models to respond to the problems that appear in the empirical study of some economic data.
- CM32 (Coordinate econometric work in multidisciplinary teams.) Coordinate econometric work in multidisciplinary teams.
- KM29 (Recognise confidence intervals and the significance of predictions.) Recognise confidence intervals and the significance of predictions.
- SM29 (Search for economic information from various sources: Databases, Internet, etc.) Search for economic information from various sources: Databases, Internet, etc.
- SM31 (Specify models, estimation methods, and inference.) Specify models, estimation methods, and inference.
- SM33 (Communicate the results of econometric analysis applied to economic and business data sources.) Communicate the results of econometric analysis applied to economic and business data sources.

Contents

Unit 1: Introduction to econometric analysis

- What is econometrics? Objectives
- Causation versus correlation
- The nature of economic data: experimental data versus observational data
- The structure of economic data

Unit 2: The simple regression model: estimation

- The simple regression model. The regression line
- Least squares estimation. The fitted line. Goodness of fit
- Interpretation of the coefficients. Special cases: dependent variable in logs. Qualitative regressor
- Distribution of the estimator under classical assumptions. Statistical properties
- Applications

Unit 3: The simple regression model: inference

- Inference in a regression model
- Hypothesis testing with the t-statistic
- Confidence intervals for a regression parameter
- Applications

Unit 4: The multiple regression model: estimation

- The multiple regression model. The population regression function
- Least squares estimation. The sample regression function
- Goodness of fit. Coefficient of determination. Adjusted coefficient.
- Distribution of the estimator under ideal conditions. Statistical properties
- The components of the variance of the estimator
- Applications.

Unit 5: Linear regression analysis: inference and extensions

- Hypothesis testing with the t statistic. Confidence intervals
- Hypothesis testing using the F statistic
- Inference under the presence of collinearity
- Regression models with variables in log. Polynomial forms. Interaction terms
- Test of structural change
- Applications

Unit 6: Extensions of the Regression Model: Inference Problems and Endogeneity

- Limitations of the classical assumptions of the regression model
- Heteroskedasticity: consequences for inference and robust standard errors
- Autocorrelation: the nature of the problem in time-series data and corrections for inference
- Endogeneity and omitted-variable bias
- Introduction to instrumental variables. Relevance and exogeneity conditions for an instrument
- Instrumental variables estimation and two-stage least squares
- Applications

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Studying and problem solving	88.5	3.54	CM31, CM32, CM55, CM56, KM29, KM53, SM29, SM31, SM33, SM53, SM55, SM57

Tutoring	6	0.24	CM31, CM32, CM55, CM56, KM29, KM53, SM29, SM31, SM33, SM53, SM55, SM57
Lectures	32.5	1.3	CM31, CM32, CM55, CM56, KM29, KM53, SM29, SM31, SM33, SM53, SM55, SM57
Lab sessions	17	0.68	CM31, CM32, CM55, CM56, KM29, KM53, SM29, SM31, SM33, SM53, SM55, SM57

The course will be structured as follows:

1. Lectures

During lectures, key concepts and methods will be presented using many examples to facilitate a clear understanding of the materials presented. An exercise list will be provided for each unit. Students will be asked to work on them, as an independent activity, in small groups or on their own. The instructor will select some exercises from the lists to be discussed in class and can use some of them as an evaluation activity.

2. Lab sessions

In order to better grasp the different econometric concepts and methods, some of the sessions will take place in the computer room, or in the classroom using personal computers. In these sessions econometric software (RStudio) will be used. The main goal for these sessions will be for the student to learn to rigorously apply to tools presented.

3. Tutoring

Students can use instructor's office hours to get help on specific questions. Office hours will be announced in either the intranet (*Campus Virtual*) or in the instructor's webpage.

4. Studying

It is expected that the activities described above, take about one a fraction of the time that the student is supposed to dedicate to *Econometrics I*. The rest of the time should be filled with students' independent work (studying, reading the course textbook, problem solving,...). This activity is crucial to assimilate the theoretical aspects and the applications of the tools presented.

Note: The proposed teaching methodology may undergo some modifications according to the restrictions imposed by the health authorities on on-campus courses.

Annotation: within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
Final exam	50%	2	0.08	CM31, CM32, CM55, CM56, KM29, KM53, SM29, SM31, SM33, SM53, SM55, SM57
Midterm	25%	1.5	0.06	CM31, CM32, CM55, CM56, KM29, KM53, SM29, SM31, SM33, SM53, SM55, SM57
Exercise submission	25%	2.5	0.1	CM31, CM32, CM55, CM56, KM29, KM53, SM29, SM31, SM33, SM53, SM55, SM57

This subject does not offer the option for comprehensive evaluation. Student's evaluation will be based on the following activities:

1. Midterm exam

There will be a written test covering the material from Units 1,2 and 3. It will be a closed book exam.

2. Final exam

There will be a written test covering the material from Units 1,2,3,4 and 5. It will be a closed book exam.

3. Assignments

Students will be asked to turn two sets of exercises that will be done during lab sessions. The first set, with a weight of 10%, will be done in a lab session before the midterm. The second set, with a weight of 15%, will be done in a lab session before the final.

Grading Policy

a. Course grade is calculated according to the following expression:

$$\text{COURSE GRADE} = 0.25 * \text{ASSIGNMENTS} + 0.25 * \text{MIDTERM} + 0.50 * \text{FINAL}$$

b. To pass the course, the course grade needs to be equal or greater than 5. If the course grade is between 3.5 and 4.9, the student can sit in the retake exam, as established in section Retake process included below. The student will fail the course if the grade is below 3.5.

c. A student who has not participated in any of the assessment activities will be considered as 'Not evaluable'.

Calendar of evaluation activities

The dates of the evaluation activities (midterm exams, exercises in the classroom, assignments, ...) will be announced well in advance during the semester.

The date of the final exam is scheduled in the assessment calendar of the Faculty.

"The dates of evaluation activities cannot be modified, unless there is an exceptional and duly justified reason why an evaluation activity cannot be carried out. In this case, the degree coordinator will contact both the teaching staff and the affected student, and a new date will be scheduled within the same academic period to make up for the missed evaluation activity." Section 1 of Article 264. Calendar of evaluation activities (Academic Regulations UAB).

Students of the Faculty of Economics and Business, who in accordance with the previous paragraph need to change an evaluation activity date must process the request by filling out an Application for exams' reschedule: e-Formulari per a la reprogramació de proves.

Grade revision process

After all grading activities have ended, students will be informed of the date and way in which the course grades will be published. Students will be also be informed of the procedure, place, date and time of grade revision following University regulations.

Retake Process

"To be eligible to participate in the retake process, it is required for students to have been previously been evaluated for at least two thirds of the total evaluation activities of the subject." Section 2 of Article 261. The recovery (UAB Academic Regulations). Additionally, it is required that the student to have achieved an average grade of the subject greater than or equal to 3.5 and less than 5.

The date of the retake exam will be posted in the calendar of evaluation activities of the Faculty. Students who take this exam and pass, will get a grade of 5 for the subject. If the student does not pass the retake, the grade

will remain unchanged, and hence, student will fail the course.

Irregularities in evaluation activities

In spite of other disciplinary measures deemed appropriate, and in accordance with current academic regulations, "in the case that the student makes any irregularity that could lead to a significant variation in the grade of an evaluation activity, it will be graded with a 0, regardless of the disciplinary process that can be instructed. In case of various irregularities occur in the evaluation of the same subject, the final grade of this subject will be 0". Section 11 of Article 266. Results of the evaluation. (UAB Academic Regulations).

The completion of assessment activities is subject to the provisions set out in this course guide and in the "[Policy of the School of Economics and Business on the Detection of Irregularities during Assessment Activities](#)", which regulates the conditions under which assessment tasks are conducted and the procedures applicable in cases where indications of irregularities are detected. Students are encouraged to consult the policy.

Use of AI

Prohibited use: In this course, the use of Artificial Intelligence (AI) technologies is not allowed at any stage. Any work that includes AI-generated content will be considered a breach of academic integrity and may result in a partial or total penalty in the grade for the activity, or more serious sanctions in severe cases.

Bibliography

- Stock, J.H. & Watson, M.M., *Introduction to Econometrics*. Pearson Education.
- Wooldridge, J. M., *Introductory Econometrics: A Modern Approach*. South-Western Cengage learning.

Software

The software used in this course is: RStudio and Gretl.

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	1	Catalan	second semester	morning-mixed
(PAUL) Classroom practices	1	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	1	Catalan	second semester	morning-mixed
(TE) Theory	2	Spanish	second semester	morning-mixed
(PAUL) Classroom practices	2	Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	2	Spanish	second semester	morning-mixed
(TE) Theory	4	English	second semester	morning-mixed
(PAUL) Classroom practices	4	English	second semester	morning-mixed

(PLAB) Practical laboratories	4	English	second semester	morning-mixed
(TE) Theory	8	English	second semester	morning-mixed
(PAUL) Classroom practices	8	English	second semester	morning-mixed
(PLAB) Practical laboratories	8	English	second semester	morning-mixed
(TE) Theory	51	Spanish	second semester	afternoon
(PAUL) Classroom practices	51	Spanish	second semester	afternoon
(PLAB) Practical laboratories	51	Spanish	second semester	afternoon
(TE) Theory	52	Catalan	second semester	afternoon
(PAUL) Classroom practices	52	Catalan	second semester	afternoon
(PLAB) Practical laboratories	52	Catalan	second semester	afternoon
(TE) Theory	60	Spanish	first semester	morning-mixed
(PAUL) Classroom practices	60	Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	60	Spanish	first semester	morning-mixed