

Academic year	2017-18
Subject	21205 - Econometrics
Group	Group 34, 1S, GATU
Syllabus	M
Language	English

## Subject

<b>Name</b>	21205 - Econometrics
<b>Credits</b>	2.4 in-class (60 hours) 3.6 distance (90 hours) 6 total (150 hours).
<b>Group</b>	Group 34, 1S, GATU (Campus Extens)
<b>Period</b>	First semester
<b>Language</b>	Catalan

## Lecturers

Lecturers	Office hours for students					
	Starting time	Finishing time	Day	Start date	End date	Office
Catalina Natividad Juaneda Sampol <a href="mailto:nati.juaneda@uib.es">nati.juaneda@uib.es</a>	11:00	12:00	Wednesday	13/09/2017	09/02/2018	DB229 Edifici G.M. Jovellanos (cita prèvia per e-mail)
	11:00	12:00	Tuesday	12/02/2018	31/05/2018	DB229 Edifici G.M. Jovellanos (cita prèvia per e-mail)
Heiko Jürgen Rachinger - <a href="mailto:heiko.rachinger@uib.es">heiko.rachinger@uib.es</a>	19:15	19:45	Monday	11/09/2017	20/02/2018	DB210 - edificio Jovellanos - cita previa por e-mail
	12:15	12:45	Monday	11/09/2017	20/02/2018	DB210 - edificio Jovellanos - cita previa por e-mail
Victor Emilio Troster - <a href="mailto:victor.troster@uib.es">victor.troster@uib.es</a>	14:30	15:30	Monday	11/09/2017	20/12/2017	DB 219
Audrone Virbickaite - <a href="mailto:audrone.virbickaite@uib.es">audrone.virbickaite@uib.es</a>	11:00	12:30	Wednesday	23/10/2017	27/06/2018	DB210 cita previa por email

## Context

This subject starts out from the contents already studied in "Analysis of Economic Data". In order to be able to grasp the contents of "Econometrics" more easily, students are strongly advised to review the contents of "Analysis of Economic Data" as soon as the academic year starts.

The main objective of "Econometrics" is the detailed study of some econometric techniques commonly used in applied research in the context of Economics and Business. The first part of the course covers the principles of statistical inference, the concepts of estimator and confidence interval, as well as hypothesis testing. The second part of the course introduces the study of the simple linear regression model, considering the relevant methods of hypothesis testing, and its generalization to multiple regression, incorporating qualitative explanatory variables (known as "dummies") into the linear regression model.

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The language of instruction for this group is English, which implies that during the course students should learn specific economic/business/tourism-related vocabulary and develop their communication skills in English, therefore acquiring further specialized knowledge of the English language.

## Requirements

### Recommended

A good knowledge of the contents of "Analysis of Economic Data" and "Mathematics" will facilitate the understanding of the contents of this subject, as well as a good knowledge of English.

### Skills

The main objective of the subject is the understanding of some econometric techniques commonly used in applied research in the Economics and Business context. It will provide basic training in handling econometric techniques as tools of analysis of Economics and Business data, using the theoretical frameworks taught in various Economics and Business courses, and in interpreting and explaining the results obtained in the light of those theories, as well as in carrying out predictions. The methods and techniques explained in the "Econometrics" subject are transferable to most Economics and Business datasets that students may come across in their future professional careers.

### Specific

- \* CE2.1.7 A partir de dades de interès econòmic-empresarial, ser capaç de aplicar les eines estadístiques i econòmiques adequades per a l'anàlisi de la empresa i el seu entorn.
- \* CE2.3.7 Conocer las fuentes de datos estadísticos y económicos relevantes así como las herramientas de análisis adecuadas para preparar la toma de decisiones en empresas y organizaciones, especialmente en los niveles operativo y táctico.
- \* CE2.4 Defender las soluciones propuestas de una manera articulada a partir de los conocimientos teóricos y técnicos adquiridos.

### Generic

- \* CG3 Capacidad para comunicarse en inglés.
- \* CG4 Capacidad para usar habitualmente una variada gama de instrumentos de tecnología de la información y las comunicaciones.
- \* CG5 (CB3) Tener la capacidad de reunir e interpretar datos relevantes para emitir juicios que incluyan una reflexión sobre temas relevantes de índole social, científica o ética.

### Basic

- \* You may consult the basic competencies students will have to achieve by the end of the degree at the following address: <http://www.uib.eu/study/grau/Basic-Competences-In-Bachelors-Degree-Studies/>

## Content

## Syllabus

### Theme content

- Topic 1. Statistical inference: estimation
  1. Main concepts
  2. Parameter estimation: point estimator and estimator properties
  3. Parameter estimation: interval estimator (confidence interval)
  4. Main estimators
- Topic 2. Statistical inference: hypothesis testing
  1. Hypothesis specification
  2. Test statistic and decision criteria
  3. Test quality: error types, power and p-value
  4. Main parametric tests
  5. Using EXCEL and GRETL in inference
- Topic 3. The simple linear regression model
  1. Econometric modelling
  2. Linear correlation and regression
  3. Specification of the simple linear regression model
  4. Statistical hypotheses on the classical regression model
  5. Estimation by Ordinary Least Squares (OLS)
  6. Model testing, validation and selection
  7. Prediction
  8. Using GRETL and exercises
- Topic 4. The multiple linear regression model
  1. Specification of the multiple linear regression model
  2. Estimation by Ordinary Least Squares (OLS)
  3. Interpretation of results and parameter testing (individual, joint and restrictions)
  4. Model testing, validation and selection
  5. Prediction
  6. Using GRETL and exercises
- Topic 5. Qualitative explanatory variables (dummies)
  1. Specification and OLS estimation with one dummy and its category groups
  2. Specification and OLS estimation with two or more dummies and their category groups
  3. Interactions
  4. Dummies and structural breaks
  5. Dummies and seasonality
  6. Using GRETL and exercises

### Teaching methodology

#### In-class work activities

Modality	Name	Typ. Grp.	Description	Hours
Theory classes	Lectures	Large group (G)	Lectures allow a detailed exposition of the most important aspects of each topic, especially the new concepts. They also allow a special focus on the most difficult issues,	40



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Modality	Name	Typ. Grp.	Description	Hours
			where students need more learning support. Finally, they also facilitate the understanding of the context in which each topic is placed, including the relationships between the different topics. Lectures will take up an average of 40 hours per student.	
Practical classes	Computer classes	Medium group (M)	At the end of topics 2 to 5 there will be computer classes to deepen the understanding of the theory and to allow the student to apply the theoretical concepts to statistical data. The data analysis package EXCEL and the econometric package GRETL will be used to this end. Computer sessions will take up an average of 10 hours per student.	13
Assessment	Computer-based tasks	Medium group (M)	In one selected computer class during the semester the student will be required to carry out a set of computer tasks in GRETL for assessment. This set of tasks will be based on Bloc 2 (topics 3 to 5 - linear regression model and dummies) and is worth 20% of the final mark. The questions and the data will be provided at the start of the class and the answers must be uploaded before the end of the class. A minimum mark of 3 in the computer-based assessment is required for the student to pass the course.	1.5
Assessment	Final exam	Large group (G)	For those students who fail the course during the semester in-class assessment, and for Pathway B students, there will be two final exams in the examination periods defined by the University, the first one in January and the second one in February. The final exam is worth 100% of the final mark and the pass mark is a 5. The length of the final exam will be 2 hours. Note that students who pass through in-term assessment either Bloc 1 (statistical inference, worth 40% of the final mark) or Bloc 2 (regression analysis and dummies, worth 60% of the final mark) will not need to repeat that bloc in the final exam.	2.5
Assessment	In-class tests	Medium group (M)	In two selected classes during the semester the student will be required to take two in-class tests, the first one on Bloc 1 (statistical inference) and the second one on Bloc 2 (linear regression model and dummies). Each test is worth 40% of the final mark and a minimum mark of 3 in each test is required for the student to pass the course by continuous assessment.	3

At the beginning of the semester a schedule of the subject will be made available to students through the UIB digital platform. The schedule shall at least include the dates when the continuing assessment tests will be conducted and the hand-in dates for the assignments. In addition, the lecturer shall inform students as to whether the subject work plan will be carried out through the schedule or through another way included in the Campus Extens platform.

### Distance education work activities

Modality	Name	Description	Hours
Individual self-study	Self-study	Students should study the lecture material before each lecture and also review the lecture content after each lecture in order to ensure that they have grasped the basics of the subject. They should also solve the exercises proposed to them. Similarly, to deepen the understanding of lecture contents	90

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Modality	Name	Description	Hours
		and place them in context it is important to study the bibliography of the course.	

### Specific risks and protective measures

The learning activities of this course do not entail specific health or safety risks for the students and therefore no special protective measures are needed.

### Student learning assessment

#### ASSESSMENT PATH A: FULL-TIME STUDENTS ENROLLING ON THE COURSE FOR THE FIRST TIME

First attempt assessment will be composed of two blocs of in-term assessment:

##### **BLOC 1: Statistical Inference (Topics 1 and 2)**

This bloc has one piece of assessment (multiple choice TEST 1), to be taken during a computer class, and worth 40% of the final mark.

##### **BLOC 2: Regression model and dummy variables (Topics 3 to 5)**

This bloc has two pieces of assessment to be taken during two separate computer classes: TEST 2, worth 40% of the final mark, and the GRETL PRACTICE, worth 20% of the final mark, which consists of a questionnaire made available in Campus Extens, to be answered during the class time using a dataset provided at that time and carrying out regression analysis tasks in GRETL.

Each piece of assessment will be marked on a 0-10 scale. The final mark will be a weighted average of the marks obtained in the different components. A student will pass the course with a minimum final mark of 5 and a minimum mark of 3 in each of the three pieces of continuous assessment. The in-term assessment is recoverable by final exam, which is worth 100% of the final mark. The recovery is done as follows:

##### **BLOC 1: Statistical Inference (Topics 1 and 2)**

This bloc recovers TEST 1 on statistical inference and is worth 40% of the final mark. Only students who got less than 3 in TEST 1 will have to re-take this bloc in the final exam.

##### **BLOC 2: Regression model and dummy variables (Topics 3 to 5)**

This bloc recovers both TEST 2 and the GRETL PRACTICE on regression analysis and dummies, worth 60% of the final mark. Only students who got less than 3 in at least one of the assessments of bloc 2 (either TEST 2 or the GRETL PRACTICE) will have to re-take this bloc in the final exam.

IN CASE A STUDENT GETS MORE THAN 3 AT EACH PIECE OF IN-TERM ASSESSMENT BUT THE OVERALL MARK IS LESS THAN 5, THE STUDENT CAN CHOOSE TO ANSWER ALL THE EXAM OR JUST ONE OF THE BLOCS. IN ANY CASE, THE HIGHEST MARK FOR EACH BLOC WILL BE CONSIDERED IN THE CALCULATION OF THE OVERALL MARK FOR THE COURSE.

Students will be considered as absent from examination if the assessment activities handed in correspond to a percentage equal to or less than 35% of the final mark. The justifications accepted by UIB for not participating

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in assessment activities are the death of a first/second line direct relative of the student's (for example, parents or grandparents), hospitalization of the student, or participation of the student in a court jury. If one of these situations is proven by a certified document, the student is given an extension of the deadline to hand in those assessment activities that could not be handed in because of that situation.

### **ASSESSMENT PATH B: OPTIONAL FOR PART-TIME STUDENTS AND STUDENTS THAT FAILED THE COURSE AT LEAST ONCE AFTER HAVING BEEN PRESENT AT A MINIMUM OF 50% OF IN-TERM ASSESSMENT**

Assessment will be composed of a final exam to be taken in January and recoverable in February.

The final exam will be marked on a 0-10 scale. A student will pass the course with a minimum final mark of 5 in the final exam.

#### **Computer-based tasks**

Modality	Assessment
Technique	Real or simulated task performance tests ( <b>retrievable</b> )
Description	In one selected computer class during the semester the student will be required to carry out a set of computer tasks in GRETl for assessment. This set of tasks will be based on Bloc 2 (topics 3 to 5 - linear regression model and dummies) and is worth 20% of the final mark. The questions and the data will be provided at the start of the class and the answers must be uploaded before the end of the class. A minimum mark of 3 in the computer-based assessment is required for the student to pass the course.
Assessment criteria	Set according to the competences described.
Final grade percentage:	20% for the training plan A
Final grade percentage:	0% for the training plan B

#### **Final exam**

Modality	Assessment
Technique	Short-answer tests ( <b>retrievable</b> )
Description	For those students who fail the course during the semester in-class assessment, and for Pathway B students, there will be two final exams in the examination periods defined by the University, the first one in January and the second one in February. The final exam is worth 100% of the final mark and the pass mark is a 5. The length of the final exam will be 2 hours. Note that students who pass through in-term assessment either Bloc 1 (statistical inference, worth 40% of the final mark) or Bloc 2 (regression analysis and dummies, worth 60% of the final mark) will not need to repeat that bloc in the final exam.
Assessment criteria	Set according to the competences described.
Final grade percentage:	0% for the training plan A
Final grade percentage:	100% for the training plan B

#### **In-class tests**

Modality	Assessment
Technique	Objective tests ( <b>retrievable</b> )
Description	In two selected classes during the semester the student will be required to take two in-class tests, the first one on Bloc 1 (statistical inference) and the second one on Bloc 2 (linear regression model and dummies). Each



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test is worth 40% of the final mark and a minimum mark of 3 in each test is required for the student to pass the course by continuous assessment.

Assessment criteria Set according to the competences described.

Final grade percentage: 80% for the training plan A

Final grade percentage: 0% for the training plan B

## Resources, bibliography and additional documentation

### Basic bibliography

HILL, R. C., GRIFFITHS, W.E. and LIM, G. C. (2012), "Principles of Econometrics", Wiley, 4th edition.

STOCK, J.H. and WATSON, M.M. (2012): "Introduction to Econometrics". Pearson..

WOOLDRIDGE, J. M. (2006), "Introductory Econometrics: a modern approach", South-Western, 2nd edition.

### Complementary bibliography

ARCARONS, J. and CALONGE, S. (2008), "Microeconometría: introducción y aplicaciones con software econométrico para Excel", Delta Publicaciones.

ASHENFELTER, O., LEVINE, P. B. and ZIMMERMAN, D. J. (2006), "Statistics and Econometrics: methods and applications", Wiley.

GREENE, W. H. (2007), "Econometric analysis", Addison-Wesley / Prentice Hall, 6th edition.

GUJARATI, D. (2009), "Econometrics", 5th edition, McGraw-Hill.

KENNEDY, P. (2003), "A Guide to Econometrics", MIT Press.

MADDALA, G. S. (1992), "Introduction to econometrics", Prentice Hall, 2nd edition.

NEWBOLD P., CARLSON, W. and THORNE, B. (2009), "Statistics for business and economics", Addison-Wesley / Prentice Hall, 7th edition.

NOVALES, A. (1996), "Estadística y Econometría", McGraw-Hill.

