# Universitat de les Illes Balears

## Teaching guide

## Subject identification

| | |
|---|---|
| **Subject** | 21205 - Econometrics |
| **Credits** | 2.4 de presencials (60 hours) 3.6 de no presencials (90 hours) 6 de totals (150 hours). |
| **Group** | Group 60, 1S, GADE (Campus Extens) |
| **Teaching period** | First semester |
| **Teaching language** | English |

### Professors

| Lecturers | Horari d'atenció als alumnes | | | | | |
|---|---|---|---|---|---|---|
| | Starting time | Finishing time | Day | Start date | Finish date | Office |
| Helena Isabel Ferreira Marques | 12:30 | 13:00 | Thursday | 13/02/2017 | 29/05/2017 | DB255 |
| helena.ferreira-marques@uib.es | 11:00 | 12:30 | Monday | 13/02/2017 | 29/05/2017 | DB255 |

## Contextualisation

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 and its generalization to multiple regression, considering the relevant methods of hypothesis testing. Finally, the third part of the course is centered on the incorporation of qualitative explanatory variables (known as "dummies") into the linear regression model.

## Requirements

### Recommendable

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

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|---|---|---|---|
| Academic year | 2016-17 | | |
| Subject | 21205 - Econometrics | | |
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**Universitat**
de les Illes Balears

# Teaching guide

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 datos de interés económico-empresarial, ser capaz de aplicar las herramientas estadísticas y econométricas adecuadas para el análisis de la empresa y su entorno.
* 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**

### Theme content

Topic 1. Statistical inference: estimation
1. Basic 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 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

**Teaching guide**

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| Academic year | 2016-17 |
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7. Prediction

8. Using GRETL in regression

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, 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. | 40 |
| Practical classes | Computer classes | Medium group (M) | At the end of each topic there will be computer classes to deepen the understanding of the theory and to alllow the student to apply the theoretical concepts to statistical data. The free econometric package GRETL will be used to this end. In one selected computer class during the semester the student will be required to upload a set of computer tasks carried out in the class for assessment. 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 upload a set of computer tasks carried out in the class for assessment. This set of tasks will be based on the regression model using GRETL and is worth 30% 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 |

Document automatically generated at 1310:29 of 29/06/2017

# Teaching guide

| Modality | Name | Typ. Grp. | Description | Hours |
|----------|------|-----------|-------------|-------|
| Assessment | Final exam | Large group (G) | For those students who fail the course during the semester in-class assessment (Group A) and for Pathway B students (Group B), there will be a final exam in the examination periods defined by the University. Group A students have to choose between the January or February exam periods and for them the final exam is worth 70% of the final mark corresponding to the two in-class partial exams. Group B students take the final exam in January and can recover the mark in February. For these students, 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. | 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 statistical inference and the second one on the linear regression model. Each test is worth 35% 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 UIBdigital 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 and place them in context it is important to study the bibliography of the course. | 90 |

## 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 different forms of in-term assessment:

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# Teaching guide

1) During term time there will be computer classes covering various topics. In one of those classes, a question sheet will be uploaded into Campus Extens together with a dataset. The assignment should be handed in by uploading it also into Campus Extens at the end of the class. Assignments will consist on the application of various econometric techniques to the datasets provided by the lecturers, using GRETL. The computer-based assignment will be worth 30% of the final mark and it is not recoverable.

2) In two classes during the semester two in-class tests will be given, the first one on statistical inference and the second one on the linear regression model. Each test will be worth 35% of the final mark and is recoverable by final exam if the student fails the course by in-term assessment. In this case, the final exam is worth 70% of the final mark and the student can choose between taking it in January or February.

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.

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 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 **(non-retrievable)** |
| Description | In one selected computer class during the semester the student will be required to upload a set of computer tasks carried out in the class for assessment. This set of tasks will be based on the regression model using GRETL and is worth 30% 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: 30% for the training plan A
Final grade percentage: 0% for the training plan B

## Final exam

| | |
|---|---|
| Modality | Assessment |
| Technique | Short-answer tests **(retrievable)** |
| Description | For those students who fail the course during the semester in-class assessment (Group A) and for Pathway B students (Group B), there will be a final exam in the examination periods defined by the University. Group A students have to choose between the January or February exam periods and for them the final exam is worth 70% of the final mark corresponding to the two in-class partial exams. Group B students take the final exam |

Date of publication: 18/07/2016

Document automatically generated at 1310:29 of 29/06/2017

# Teaching guide

in January and can recover the mark in February. For these students, 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.

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 **(retrievable)** |
| Description | In two selected classes during the semester the student will be required to take two in-class tests, the first one on statistical inference and the second one on the linear regression model. Each test is worth 35% of the final mark and a minimum mark of 3 in each testis required for the student to pass the course by continuous assessment. |
| Assessment criteria | Set according to the competences described. |

Final grade percentage: 70% 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. andTHORNE, B.(2009), "Statistics for business and economics", Addison-Wesley / Prentice Hall, 7th edition.
NOVALES, A. (1996), "Estadística y Econometría", McGraw-Hill.

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