UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: MATHEMATICS FOR ECONOMICS I
Code: 53304
Type: BASIC
ECTS credits: 9
Degree: 316 - UNDERGRADUATE DEGREE IN ECONOMICS
Academic year: 2023-24
Center: 5 - FACULTY OF ECONOMICS AND BUSINESS
Group(s): 10 17
Year: 1
Duration: AN
Main language: Spanish
Second language:
Use of additional languages:
English Friendly: Y
Web site:
Bilingual: N

Lecturer: **MARIA ELISA AMO SAUS** - Group(s): **10 17**

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2. Pre-Requisites

In general, the knowledge that is required to successful follow a course in maths relates with the basic algebraic properties of polynomials, logarithms and solving linear equations. It is relevant a basic use of derivatives, including the standard techniques (sums, products and chain rule), as well as basic integration. Finally, it is also important to know the basic techniques for function representations and in particular the representation of the main functions.

3. Justification in the curriculum, relation to other subjects and to the profession

The courses in maths in this degree, provide with formal methods to other courses in the degree, like Statistics, Economy and Finance.

In relation with professional skills, the main goal of the course is to introduce, from a mathematical perspective, the models and methods of quantitative analysis, including methods for decision making.

4. Degree competences achieved in this course

Course competences

Code	Description
E03	Ability to find economic data and select relevant facts.
E06	Application of profesional criteria to the analysis of problems, based on the use of technical tools.
G01	Possession of the skills needed for continuous, self-led, independent learning, which will allow students to develop the learning abilities needed to undertake further study with a high degree of independence.
G03	Develop oral and written communication skills in order to prepare reports, research projects and business projects and defend them before any commission or group of professionals (specialised or non-specialised) in more than one language, by collecting relevant evidence and interpreting it appropriately so as to reach conclusions.
G04	Ability for the use and development of information and communication technology in the development of professional activity.
G05	Capacity for teamwork, to lead, direct, plan and supervise multidisciplinary and multicultural teams in both national and international environments.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Train the student to work out problems in creative and innovative ways.

To know the tools and methods for quantitative analysis of markets, sectors and companies, including models for decision-making and economic forecasting models.

Enable student for autonomous work and learning, as well as for personal initiative

Train the student to search for information in order to analyze it, interpret is meaning, synthesize it and communicate it to others.

Train the student to listen to and defend arguments orally or in writing

Additional outcomes

6. Units / Contents

Unit 1: Basic Elements of Linear Algebra

Unit 2: Vector Space Rn

Unit 3: Linear applications and associated matrices

Unit 4: Matrix diagonalization
Unit 5: Quadratic forms
Unit 6: Real numbers. Sequences and Series
Unit 7: Real functions of a real variable
Unit 8: Real functions of a real variable
Unit 9: The definite integral

ADDITIONAL COMMENTS, REMARKS

This subject, Matemáticas I para la Economía, consists of 5 units of Linear Algebra (units 1-5), 2 units of one-variable Calculus (units 6 and 7) and 2 units of Integration (units 8 and 9).

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	E03 E06 G01 G03 G04	2	50	N	-	hey will show the outlines of each of the topics, as well as the most important and/or difficult contents. There will also be time for examples and practical applications.
Class Attendance (practical) [ON-SITE]	Problem solving and exercises	E03 E06 G01 G03 G04	1	25	N	-	In these classes the fundamental role shifts from the teacher to the student. In them, the teacher will dedicate time to ask questions to the students to check that they have understood well the contents of each topic. In addition, the student will solve the proposed problems, always with the help of the teacher.
Other on-site activities [ON-SITE]	Assessment tests	E03 E06 G01 G03 G04	0.08	2	Y	Y	Evaluation activities: self-assessment test, problem solving and/or group activities.
Progress test [ON-SITE]	Assessment tests	E03 E06 G01 G03 G04 G05	0.08	2	Y	Y	Throughout the course there will be two individual and written evaluable activities.
Final test [ON-SITE]	Assessment tests	E03 E06 G01 G03 G04	0.12	3	Y	Y	Final exam of the whole subject.
Other off-site activity [OFF-SITE]	Problem solving and exercises	E03 E06 G01 G03 G04 G05	2.18	54.5	N	-	Most of the class practices will be individual, the student will keep them in a portfolio until the time the teacher requests their presentation. This will serve as a study of the subject.
Study and Exam Preparation [OFF-SITE]	Self-study	E03 E06 G01 G03 G04 G05	2.68	67	N	-	Study during the course of the subject
Study and Exam Preparation [OFF-SITE]	Self-study	E03 E06 G01 G03 G04	0.78	19.5	N	-	Preparation and study of the subject, both the theoretical and practical parts for the final exam.
Mid-term test [ON-SITE]	Assessment tests	E03 E06 G01 G03 G04	0.08	2	Y	Y	Written test. There will be two throughout the course.
		Total:	**9**	**225**			
		Total credits of in-class work: 3.36					**Total class time hours: 84**
		Total credits of out of class work: 5.64					**Total hours of out of class work: 141**

As: Assessable training activity
Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Final test	0.00%	100.00%	There will be a final test of the whole subject in 2 parts: 1) Written test on topics 1,2,3,4 and 5 (test and/or theory questions and/or practical exercises). 2) Written test on topics 6,7,8 and 9 (test and/or theory questions and/or practical exercises). RECOVERABLE CHARACTER: The student can recover each of the two continuous evaluation tests described above by taking the corresponding part of this final exam. Students who opt for NON-CONTINUOUS evaluation will take a final test that will include the specific tests considered necessary to evaluate all the competences of the subject.
Mid-term tests	35.00%	0.00%	Objective test or first partial exam of the course (topics 1,2,3,4 and 5)
Assessment of active participation	10.00%	0.00%	During the face-to-face class, different evaluation activities such as tests, exercises, group activities, etc. (topics 1,2,3,4 and 5)

			will be requested.
Progress Tests	5.00%	0.00%	Individual written progress test on topics 1, 2 and 3.
Mid-term tests	35.00%	0.00%	Objective test or second partial exam of the subject (topics 6,7,8 and 9).
Assessment of active participation	10.00%	0.00%	During the face-to-face class, different evaluation activities such as tests, problems, group activities, etc. will be requested (topics 6, 7, 8 and 9).
Progress Tests	5.00%	0.00%	Individual written progress test on topics 6 and 7.
Total:	**100.00%**	**100.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

The subject follows an evaluation system based on the assessment of various training activities and an exam. The student is required to obtain at least a 4 in the final evaluation test to make an average with the grade obtained in the rest of the proposed training activities. Any student may change to the non-continuous assessment mode as long as they have not participated during the class teaching period in assessable activities that together account for at least 50% of the total assessment of the subject and, in that case, they must communicate it before the end of the class period.

Regarding the evaluation in case of illness or other special circumstances (mitigating rules), see article 6 of the Student Evaluation Regulation of the University of Castilla-La Mancha.

Non-continuous evaluation:

The evaluation will be carried out with a final test that will include the specific tests that are considered necessary to evaluate all the competencies of the subject.
Regarding the evaluation in case of illness or other special circumstances (mitigating rules), see article 6 of the Student Evaluation Regulation of the University of Castilla-La Mancha.

Specifications for the resit/retake exam:

If the student has passed any of the partial exams in the ordinary call with a grade of 5 or higher, they will not have to re-examine that part and will only recover the one they have not passed. In case of not having passed any of the two, the student will have to take an exam for the entire subject.

Specifications for the second resit / retake exam:

The evaluation will be carried out on a single written exam, being necessary to pass the subject a minimum score of 5 out of 10.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	**hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	50
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	25
Other on-site activities [PRESENCIAL][Assessment tests]	2
Progress test [PRESENCIAL][Assessment tests]	2
Final test [PRESENCIAL][Assessment tests]	3
Other off-site activity [AUTÓNOMA][Problem solving and exercises]	54.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	67
Study and Exam Preparation [AUTÓNOMA][Self-study]	19.5
Mid-term test [PRESENCIAL][Assessment tests]	2

Global activity

Activities	**hours**
Mid-term test [PRESENCIAL][Assessment tests]	2
Class Attendance (theory) [PRESENCIAL][Lectures]	50
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	25
Progress test [PRESENCIAL][Assessment tests]	2
Other on-site activities [PRESENCIAL][Assessment tests]	2
Final test [PRESENCIAL][Assessment tests]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	67
Other off-site activity [AUTÓNOMA][Problem solving and exercises]	54.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	19.5
Total horas:	225

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
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Courant, R. y Fritz, J.	Introduction to calculus and analysis	Springer-Verlag	New York	3-540-65058-X	1999	
Blanco García, S.; García Pineda, P. Y Pozo García, E. Del.	Matemáticas empresariales I. Enfoque teórico y práctico. Vol 2. Cálculo	AC	MADRID	84-9732-172-3	2002	
Blanco García, S.; García Pineda, P. Y Pozo García, E. Del.	Matemáticas empresariales I. Enfoque teórico y práctico. Vol I. Álgebra lineal.	AC	MADRID	84-9732-171-5	2002	
	Cálculo en una variable. Volumen					

Bradley, G. L. y K. J. Smith	1	Prentice Hall			1998
Burgos Román, Juan de	Cálculo de una variable real : enunciados, respuestas y just	García-Maroto		978-84-937509-9-2	2010
Burgos Román, Juan de	Cálculo diferencial : (una y varias variables) : 126 problem	García-Maroto		978-84-937509-0-9	2010
Burgos Román, Juan de	Cálculo integral : test y problemas	García-Maroto		978-84-937509-5-4	2010
Burgos Román, Juan de	Test de cálculo infinitesimal : (enunciados, respuestas y ju	García-Maroto		978-84-92976-93-5	2010
Calvo, M.E. y Otros	Problemas resueltos de matemáticas aplicadas a la economía y la empresa	AC			2003
Cancelo, J. R., López Ortega, J. Y Otros	Problemas de álgebra lineal para economistas. Tomo II	Tebar Flores			1995
Chiang, Alpha C.	Métodos fundamentales de economía matemática	McGraw-Hill Interamericana		970-10-5614-0	2006
Coquillat, F. (Fernando Coquillat Durán)	Cálculo integral : metodología y problemas	Tébar Flores		84-7360-168-8	1997
García, A., García, F. y A. Gutiérrez	Cálculo I. Teoría y Problemas de Análisis Matemático en una Variable	CLAGSA			1998
Granero, F.	Cálculo Integral y Aplicaciones	Prentice Hall			2001
Jarne, G. , Perez-Grasa, J.	Matemáticas para la economía	Mc Graw Hill.			1997
Larson, R. E.; Hostetler, R. P.; Edwards, B. H.	Cálculo	Mc Graw Hill.			1999
Lay, David, C.	Álgebra lineal y sus aplicaciones	Pearson Educacion	México	978-607-32-1398-1	2012
López, M. y Vegas, A.	Curso básico de matemáticas para la economía y la dirección de empresas I.	Pirámide			2001
Stewart, J.	Cálculo en una variable	Thomson			2001
Grossman, S. I.	Calculus of one variable	Saunders College Publishing	Fort Worth	0-03-096614-0	
Salas, S. L.	Salas and Hille's calculus : one and several variable. 7th ed	John Wiley & Sons	New York	0-471-58719-2	
Fedriani, E. M. y M. C. Melgar	Matemáticas para el éxito empresarial	Pirámide	Madrid		2010
Blanco, M.A.; Corcho, P.I.; Franco, A.; Guerrero M.M. y Polo C.	Teoría y Ejercicios de Matemáticas para la Economía y la Empresa	García Maroto Editores		84-17969-55-1	2021
Calderón, S. y Rey, M.L.	Matemáticas para la economía y la empresa	Pirámide	Madrid		2012
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David C. Lay , Steven R. Lay and Judi J. McDonald	Linear Algebra and Its Applications	PEARSON			2016
Arvesú, J.; Marcellán, F.; y Sánchez, J.	Problemas resueltos de álgebra lineal.	Thomson			2005
Barbolla, R. Y Sanz, P.	Algebra lineal y teoría de matrices	Prentice Hall			1998
Hoy, M.; Livernois, J.; McKenna, C.; Rees, R. and Stengos, T.	Mathematics for Economics (second edition)	MIT press.	London, England.	0-262-58207-4	2001
Roy, S.	A First Course in Mathematical Economics	Cambridge Scholars Publishing	Newcastle, UK.	1-5275-4723-X	2020