

## COURSE SYLLABUS 2019-20

Basic information on the course			
Course:	Mathematics		
Coursecode:	63101104	Plan:	Grade in Administration and Business Management, Grade in Economy, Grade in Finance and Accounting, and Grade in Marketing and Market Research (Curriculum 2010)
AcademicYear:	2019-20	Undergraduate/Graduate:	Undergraduate
DegreeYear:	1	Type:	Fundamental
Duration:	1st semester		
TIME DISTRIBUTION ACCORDING TO REGULATIONS			
Credits:	6		
Total time:	150		
USE OF LEARNING PLATFORM:	Teaching support		

TEACHER			
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OTHER IMPORTANT INFORMATION
Content justification
The goal of the course is to provide students with the theoretical and practical background in mathematics, which they will need in other subjects of the degree or in the exercise of their profession. Basic topics of linear algebra and differential and integral calculus are covered.
Courses related in Study Plan
This course will be useful in any other subject where posing or solving an applied problem is necessary, such as in process optimization, theoretical analysis, description of the behavior of an economy in a market,...
Pre-required knowledge
Basic knowledge of algebra and functions in one variable. It is assumed that the student has some capacity for organization, planning and decision making. General education and B1 level in English are required, B2 level is highly recommended.

## COMPETENCES

### Basic and general competences

#### *Basic competences*

- Knowledge acquisition and understanding
- Knowledge application

#### *Key competences University of Almeria*

- Basic professional skills
- Oral / written communication in English
- Problem solving skills

### Specific competences

- Knowledge acquisition and understanding
- Knowledge and application of the basic concepts of mathematics
- Skill development of the subject-specific computer software

## LEARNING OUTCOMES

- Basic knowledge of the profession: To have the basic knowledge that defines the profession of Administration and business management, for its correct performance.
- Capacity to solve problems: Ability to identify, analyze and define the significant elements that constitute a problem in order to solve it with rigor.
- Application of the theoretical knowledge of the subject in the solution of the problem raised.
- Possessing and understanding knowledge in mathematics: Knowledge, understanding and application of the basic elements of linear algebra and differential and integral calculus.

## CONTENTS

### **Module I: Differential and integral calculus in one variable**

#### **Unit 1: Differential calculus**

- Basic concepts
- Derivative, differential and applications
- Fundamental theorems. L'Hôpital's rule
- Optimization. Economic applications

#### **Unit 2: Integral calculus**

- Indefinite integral. Techniques of integration.
- Definite integral. Barrow's rule. Applications.
- Improper integral.
- Geometric series. Applications.

## Module II. Differential calculus in two variables

### Unit 3: Functions of two variables

- Function of two variables. Graphs and contours.
- Partial derivatives.
- Optimization.
- Homogeneous functions. Euler's theorem.
- Economic applications.

## Module III: Linear Algebra and Applications

### Unit 4: Linear Algebra

- Basic concepts on matrices, determinants and systems of linear equations
- Diagonalization of matrices. Powers of matrices.
- Dynamical systems.

## Learning system and methodology

- Attending the lectures and problem solving sessions.
- Active participation in classes.
- Individual study and problem solving.
- Use of the recommended bibliography, as well as of office hours.
- Use of the resources available at Aula Virtual

## Teaching innovation activities

## COMPETENCY ASSESSMENT

### Criteria and assessment tools

A minimum requirement to pass the course (for both ordinary and extraordinary calls of February and September) is 5 points from a maximum of 10. The assessment considers two aspects:

1. A written final exam, weighing 70% of the final grade.
2. Continuous assessment during the course, weighing 30% of the final score, comprised of written tests, independent works completed by the students, participation in class, or any other complementary activity established by the professor.

The final grade will be a result of adding both aspects.

### Follow-Up Mechanisms

Test, quizzes, exercises, problem sets. Final evaluation of reports, essays, projects, etc. Final exams (written or oral).

### Functional diversity / Functional disability.

- Those students with disabilities or special educational needs can get in contact with the Delegation of the Rector for the Functional Diversity (<http://www.ual.es/discapacidad>) to receive the appropriate guidance and advice in order to facilitate their instructional, learning and training processes. Likewise, these students may request the implementation of the necessary and suitable adaptations of content, methodology and evaluation that guarantee equal opportunities in their academic development. The processing of any personal data or aggregated information regarding these aforementioned students, in full compliance with the GDPR, is strictly confidential. Faculties and academic staff lecturing the course referenced by this guide/document will be in

charge of applying the recommended adaptations approved by the Delegation of the Rector for the Functional Diversity, this fact will be, therefore, notified to the School or Faculty as well as to the coordinator of the academic course.

## COURSE MATERIALS

### Recommended course materials

#### *Basic*

- Calculus of one variable (*Horst, K.E.*)
- Calculus of several variables (*Lang, S.*)
- Economist's mathematical manual (*Sydsaeter, K.*)
- Linear Algebra with applications (*Bretscher, O.*)
- Linear Algebra with applications (*Leon, S.J.*)

#### *Complementary*

- Cálculo aplicado a la Administración, Economía y Ciencias Sociales (*Hoffman, L.D.; Bradley, G.L.*)
- Matemáticas para el análisis económico (*Sydsaeter, K.; Hammond, P.J.*)
- Matemáticas Aplicadas a la Economía (*Úbeda Flores, M.; Gámez Cámara, M.A.*)

### Course materials available in UAL's library

<http://almirez.ual.es/search/e?SEARCH=MATEMATICAS>

## WEBSITE

<http://www.wolframalpha.com>

*Online resolution of derivatives, integrals, etc.*