

## COURSE SYLLABUS

Academic year 2010-2011

### 1. COURSE DESCRIPTION

|                         |                                                                         |
|-------------------------|-------------------------------------------------------------------------|
| <b>Degree:</b>          | <b>Finanzas y Contabilidad</b>                                          |
| <b>Double Degree:</b>   | <b>Derecho y Finanzas y Contabilidad</b>                                |
| <b>Course:</b>          | <b>FINANCIAL MATHEMATICS<br/>(Matemática Financiera -English group)</b> |
| <b>Module:</b>          | <b>Analysis of Financial Transactions</b>                               |
| <b>Department:</b>      | <b>Economía, Métodos Cuantitativos e Historia Económica</b>             |
| <b>Academic Year:</b>   | <b>2010-2011</b>                                                        |
| <b>Term:</b>            | <b>Segundo semestre</b>                                                 |
| <b>Total Credits:</b>   | <b>6</b>                                                                |
| <b>Year:</b>            | <b>1º</b>                                                               |
| <b>Type of Course:</b>  | <b>Obligatoria</b>                                                      |
| <b>Course Language:</b> | <b>Inglés</b>                                                           |

|                                                                     |           |            |
|---------------------------------------------------------------------|-----------|------------|
| <b>Teaching model:</b>                                              | <b>C1</b> |            |
| <b>a. General/background:</b>                                       |           | <b>50%</b> |
| <b>b. Theory-into-practice/developmental<br/>knowledge-building</b> |           | <b>50%</b> |
| <b>c. Guided Academic Activities:</b>                               |           |            |

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### 2. TEACHING TEAM INFORMATION

#### 2.1. Course coordinator : FLOR MARÍA GUERRERO CASAS

| <b>2.2. Teachers</b>  |                                                         |
|-----------------------|---------------------------------------------------------|
| <b>Name:</b>          | PATRICIA HERRANZ PEINADO                                |
| <b>Faculty:</b>       | FACULTY OF BUSINESS                                     |
| <b>Department:</b>    | ECONOMICS, QUANTITATIVE METHODS AND<br>ECONOMIC HISTORY |
| <b>Academic Area:</b> | QUANTITATIVE METHODS                                    |
| <b>Category:</b>      | PROFESORA COLABORADORA                                  |
| <b>Office hours:</b>  |                                                         |
| <b>Office No.:</b>    | 3.2.21                                                  |
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### **3. ACADEMIC CONTEXT**

#### **3.1. Course Description and Objectives**

The objective of this subject is to provide students with the knowledge and skills necessary to succeed in the world of banking and finance. This also involves using the most appropriated IT programmes for problem-solving.

The essential objective is to study the main financial operations like capitalization, bank discount, instalment credit, repayment of loans and the mathematical equations which are involved. Using the financial models studied, students will solve equations and suggest additional ways of solving them which could be useful in the financial market. As well as the general course objectives, there are several additional aims for each thematic unit.

#### **3.2. Contribution to the Training Plan**

This subject is worth 6 credits and is part of the module “Analysis of Financial Transactions”. It is studied in the second semester of the first year of the Degree in Finance and Accounting, and the Double Degree in Finance and Accounting, and Law. As well as the knowledge and skills which will be obtained through completion of the course, the main and most important aspect is to gain a logical and critical way of thinking which can later be applied to many fields.

#### **3.3. Recommendations or Prerequisites**

Basic mathematical knowledge is necessary in order to take part in this course. The content of this course is required to accomplish capital appraisals, which is extremely important for any future professional specialised in finance but also for those who wish to take exams in order to enter Public Administration or financial bodies. In these cases this subject is usually compulsory.

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### 4. SKILLS

#### 4.1 Degree Skills Developed during this Course

Instrumental:

- Ability for analysis and synthesis
- Oral and written communication in english
- Ability for solving problems
- Ability for taking decisions

Personal:

- Ability for criticism and self-criticism
- Pressure work enviroments

Systemic:

- Ability to adapt to new situations
- Ability to self-learning
- Quality motivation
- Initiative and entrepreneurship

Transverse:

- To know and understand the social consequences of financial decisions.
- To acquire information technology (IT) skills that can be adapted to a range of different financial operations

#### 4.2. Module Skills Developed during this Course

- To understand different financial laws
- To interpret correctly concepts, methods and specific techniques used in financial transactions
- To use appropriated methods to apply this concepts, methods and techniques to a different financial transactions
- To acquire the ability to select and use the appropriated computer applications to solve financial methods studied



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### **4.3. Course-specific Skills**

- To have a thorough knowledge of financial language and terminology
- Knowledge of basic financial transactions for unipersonal bussines or financial institutions
- Identification of the financial reality with the financial models estuded
- Acquisition of abilities to develop and to design instruments, tools and basic financial techniques
- Acquisition of abilities to analyse and interpret financial information (financial text, economic and financial journalism, Stock Exchange reports, financial indicators, interest rate development, etc.)

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### 5. COURSE CONTENT (COURSE TOPICS)

#### UNIT 1: SIMPLE INTEREST AND SIMPLE DISCOUNT FOR FINANCIAL TRANSACTIONS

1. Financial capital, Financial laws.
2. Simple interest. Applications.
3. Simple discount. Comparing simple interest and simple discount. Bill of exchange discount.
4. Capital equivalency. Applications.
5. Computer processing by spreadsheet.

#### UNIT 2: COMPOUND INTEREST AND COMPOUND DISCOUNT FOR FINANCIAL TRANSACTIONS

1. Compound interest. Calculations with different types of time.
2. Nominal rate. Interest rate equivalency.
3. Effective rates of interest. Applications.
4. Compound discount.
5. Computer processing by spreadsheet.

#### UNIT 3: ANNUITIES

1. Concept and classification
2. Present and future value of fixed annuities with simple laws
3. Present and future value of some annuities with compound laws: ordinary annuity, annuity due, deferred annuity, forborne annuity and perpetuity:
  - a) Fixed annuities
  - b) Variable annuities
5. Computer processing by spreadsheet.

#### UNIT 4: AMORTIZATION METHODS OF LOANS REPAYMENT

1. Concept, characteristics and classification.
2. Full amortization.
3. Interest only amortization.
4. Different amortization systems:
  - a) Fixed annuities
  - b) Fixed principal repaid
  - c) Grace period
5. Applications. Mortgage loan. Total and partial cancellation.
6. Financial value, usufruct and remainder estate of a loan.
7. Effective rates of interest.
8. Computer processing by spreadsheet.



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### **UNIT 5: AMORTIZATION METHODS OF OTHER LOANS**

1. Main concepts
2. Normal or Pure Loans: classification and main operations
3. Commercial characteristics: Loan Standardization
4. Effective rates of interest

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### **6. METHODOLOGY AND RESOURCES**

This subject is given 50% in General Teaching (GT) and 50% in Practical Teaching (PT).

In GT, for the group of 60 students, fundamental knowledge are presented and problem type are developed. The procedure is a master class with student participation. In them is intended that students acquire the deductive method, both theoretical and practical aspects.

In PT, for the group of 20 students, practical cases are developed, individually and collectively and to acquire computer tools. The procedure is an interactional model of teaching where the student participates more than the lecturer.

Sources used:

- Materials developed by lecturers.
- Classroom with a minimum capacity of 60 students.
- Classroom with a capacity of 20 students.
- Computer classroom with capacity of 20 places.

Three classrooms mentioned above must have a blackboard, a projector, a screen and a computer with internet connection.

- Software: PowerPoint, Excel, Word.
- WebCT Platform.



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### 7. ASSESSMENT

The assessment for this subject will be based on a series of ongoing activities throughout the term. These will be differently weighted according to the difficulty, effort and dedication needed.

General Teaching (GT) and Practical Teaching (PT) will be taught in the following way:

1. GT will be assessed in the form of an exam at the end of the semester. This exam will consist of theoretical questions, practical issues, and problems related to the subject. Students must show what they have learnt throughout the subject. This will make up 50% of the final grade.
2. PT will be assessed continuously throughout the subject in the form of individual tasks and group work. This will make up 30% of the final grade and cannot be retaken. There will also be three IT sessions in which students will apply their financial knowledge to a spreadsheet using Excel. The IT sessions will have an exam which will make up the remaining 20% of the final grade. This exam, as well as the exam from lectures, can be retaken.

Requirements to pass the subject:

- 1) The following minimum grades are required:
  - GT: 1.5 points.
  - IT sessions: 1 point.

- 2) When these have been completed the sum of both exams from GT and PT must be higher than or equal to 5 points out of ten.

Resit exam (July):

Students who do not pass the subject will have a chance to retake it in July. The exam will consist of an assessment of GT (50%) and IT sessions (20%) for those who did not pass in the first or second session. The same minimum grades as previously mentioned are required in order to pass.

The final grade will include the continuous assessment of PT (30%) which cannot be retaken.

Student mobility:

Those UPO students who are not able to attend seminars due to being abroad under official mobility programs (Socrates-Erasmus, Séneca, Atlanticus...) will have an additional exam, or work that will be clearly defined, in order to obtain the 50% of the grade corresponding to the continuous evaluation. Students in this situation must inform the responsible lecturers at the beginning of the academic year, before the 15th of March, 2010.

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### 8. BIBLIOGRAPHY

#### . GENERAL READING:

BONILLA M., IVARS A., MOYA I. (2006): Matemática de las operaciones financiera: teoría y práctica. Thomson. Madrid.

BRECHNER, R. (2009): Contemporary Mathematics for Business and Consumers. Thomson South-Western.

BROVERMAN, S.A. (2004): Mathematics of investment and credit. ACTEX Publications.

CAIN, J.; CARMAN, R.A. (1992): Mathematics for Business Careers. Pearson Prentice Hall.

CLEAVES, C.; HOBBS, M. (2008): Business Math, Brief and Study Guide Package. Pearson Prentice Hall.

GONZÁLEZ-CATALÁ (1991): Enfoque práctico de las operaciones de la matemática financiera. Ed. Ciencias Sociales. Madrid.

GONZÁLEZ-CATALÁ (1992): Análisis de las operaciones financieras bancarias y bursátiles. Ed. Ciencias Sociales. Madrid.

HINOJOSA RAMOS y otros (1997): Problemas de Matemáticas Financieras. Pirámide.

PRAKASH, A.J.; KARELS, G.V.; FERNANDEZ, R. (1987): Financial, Commercial, and Mortgage Mathematics and Their Applications. Praeger Publisher.

SLATER, J. (1997): Practical Business Math Procedures. Irwin/McGraw-Hill.

VÁZQUEZ CUETO (1993): Curso de matemáticas Financieras. Pirámide.

ZIMA, P.; BROWN, R.L. (1983): Mathematics of finance. McGraw-Hill.

#### FURTHER READING:

ÁLVAREZ HERREZUELO, A. (2000). Matemáticas Financieras. Paraninfo. Madrid.

ANTHONY, M y BIGGS, N. (2001). Matemáticas para la economía y las finanzas: una introducción. Cambridge University Press. Madrid.

APRAIZ LARRAGÁN, A. (2003). Fundamentos de Matemática Financiera. Desclée de Brouwer. Bilbao.

BONILLA M., IVARS A. (1994): Manual de las operaciones financieras. A.C. Madrid.

CASANOVA M. (1997): Operaciones financieras. Pirámide.

GARCÍA BOZA, J. (2002). Problemas resueltos de matemática de las Operaciones Financieras. Pirámide, Madrid.

GIL PELÁEZ (1993): Matemáticas de las operaciones financieras. Problemas resueltos. A.C. Madrid.

GONZÁLEZ VELASCO, MC. (2001). Análisis de las Operaciones Financieras (150 supuestos resueltos). Civitas. Madrid.



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LEVENFELD y otros (1997): Matemática de las operaciones financieras y de la inversión. McGraw-Hill.

LEVI, F. (1973): Curso de Matemática Financiera y Actuarial. Ed. Bosch. Barcelona. (2 tomos)

MAO, J. (1974): Análisis Financiero. Ed. El Ateneo. Buenos Aires.

MINER ARANZÁBAL, J. (2003). Curso de Matemática Financiera. McGraw-Hill. Madrid.

NAVARRO, E. y NAVE, J. (2001). Fundamentos de Matemáticas Financieras. Antoni Bosch, D.L. Barcelona.

PABLO LÓPEZ, A. De:

- (1995) Valoración Financiera y Operaciones de Financiación. Ed. Centro de Estudios Ramón Areces. Madrid.

- (1993) Matemática de las Operaciones Financieras. Ed. UNED. Madrid.