

**COURSE DATA****Data Subject**

Code	35964
Name	Introduction to actuarial techniques
Cycle	Grade
ECTS Credits	4.5
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. year	Period
1315 - Degree in Finance and Accounting	Faculty of Economics	4	First term

Subject-matter

Degree	Subject-matter	Character
1315 - Degree in Finance and Accounting	23 - Year 4 optional subjects	Optional

Coordination

Name	Department
LLEDO BENITO, JOSEP	110 - Applied Economics

SUMMARY

Introduction to actuarial techniques is assigned to the area of Quantitative Methods for Economics and Business and is taught in the first term of the fourth year of the Degree in Finance and Accounting. *Introduction to actuarial techniques* is eminently a practical subject of optional training, where the use of the computer is fundamental.

This subject will allow students to enter, through the resolution of cases and the understanding of the theoretical foundations, in the world of risk study, one of the key elements in the field of finance and insurance. The subject will offer principles for the correct management and identification of risks (qualitative methods) and their numerical evaluation (quantitative methods).

By studying this subject the student will acquire some basic rudiments for the actuarial calculation where the economic quantification of the loss associated with the materialisation of a risk can be random, as well as its possible occurrence or the temporary moment in which it can take place. Likewise, it will delve into the concepts of chance and uncertainty that are present in all the financial and economic processes of current societies.



Briefly, some of the contents to be developed in the subject are the following: the mortality table, actuarial functions in life insurance, accident models, distributions for the amount and number of claims and the R statistical software.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

No prerequisites.

It is recommended, however, that the student has basic levels of mathematics, financial mathematics and statistics (the knowledge that corresponds to those studied in the corresponding subjects of the degree of finance and accounting of previous courses), and, mainly, to have enthusiasm for learning. The subject is eminently applied.

OUTCOMES

1315 - Degree in Finance and Accounting

- Conocer y comprender las herramientas cuantitativas básicas para la gestión de seguros.
- Conocimiento de las herramientas informáticas más comúnmente utilizadas para el tratamiento y gestión de información cuantitativa.
- Capacidad para analizar instrumentos financieros internacionales y medir los riesgos que implican.
- Capacidad para resolver problemas básicos de índole actuarial.

LEARNING OUTCOMES

The fundamental results that are expected to acquire with learning are:

- Ability to develop and defend a technical report in which basic actuarial reasoning is used.
- Ability to recognise a risk problem based on the observation and analysis of reality.
- Management of quantitative tools and their application to the management environment of certain risks.
- Ability to select a theoretical frame of reference for the development of the analysis.
- Knowledge and understanding of basic tools of a quantitative nature for analysis, diagnosis and prospection, such as mathematics, statistics and econometrics.



- To identify, classify, reason, argue and interpret the relationships between variables.
- Ability to identify the statistical and actuarial problems raised and apply the knowledge acquired for its correct treatment.
- Ability to search, select and assess the appropriate information to analyse.
- To be able to apply different methods and analysis techniques with uncertainty.
- Ability to solve basic actuarial problems.

DESCRIPTION OF CONTENTS

1. Introduction

1. Actuarial terminology.
2. Basic concepts about risk and insurance.
3. Life and Non-Life insurance.

2. Life Table

1. Life table.
2. Probabilities of survival.
3. Probabilities of death.

3. R

1. Introduction.
2. Objects in R.
3. Representation and simulation of distributions.
4. Libraries (actuarial) in R.

4. Claim Models

1. Some distributions for the number of claims.
2. Some distributions for the amount of claims.
3. Principles of premium calculation.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Classroom practices	15,00	100
Attendance at events and external activities	6,00	0
Development of group work	15,00	0
Development of individual work	18,00	0
Study and independent work	28,50	0
TOTAL	112,50	

TEACHING METHODOLOGY

The teaching methodology will be varied and will use different approaches:

- Exhibition sessions by the teachers for each of the program topics. In these sessions the concepts, analytical interdependencies, theoretical notions and key empirical questions that students must learn to handle will be explained.
- Group discussion and analysis sessions from different materials that aim to raise new questions about the contents of the syllabus of the subject and to deepen the understanding of the contents of the subject.
- Realisation of group or individual works for the elaboration of reports or the resolution of cases that the teaching staff may raise. The specific guidelines for the realisation of possible work will be specified by the teachers in class according to the concerns and interests of the students and explained in detail in class. The work will be the subject of guidance, monitoring and supervision by the teachers.
- Possible attendance and active participation in conferences which are organised as complementary activities or related to the subject throughout the semester.

EVALUATION

It will be expressed by means of a numerical grade in accordance with the regulations (RD1125/2003 of September 5) establishing the European credit system and the grading system for official university degrees valid throughout the national territory.

The individual and team work carried out by the students throughout the course will be evaluated, both in terms of the acquisition of specific and generic competences and in relation to the knowledge of the module.



The teaching staff, depending on the academic circumstances of the subject, will select one or more of the following instruments for the evaluation:

- Written examinations: including objective or semi-objective tests, problem solving, short answer tests, essay, case resolution or other similar options.
- Oral examinations: including oral tests, interview, classroom discussions or oral presentations, or other similar options.
- Completion of assignments and reporting on specific issues that may arise during the course.
- Observation: application of observation scales and recording of students' attitudes in the development of tasks and activities related to the competencies.

The specific criteria and processes to be used for the evaluation, as well as their specific numerical weighting, will depend on the number of students finally enrolled and will be published in the detailed teaching guide (or slides) that the student can find in the virtual classroom of the course.

REFERENCES

Basic

- Ayuso, M., Corrales, H., Guillen, M. y Rojo, J.L., (2007), Estadística Actuarial Vida. Ed. U.B.
- Crawley, M.J. (2013), The R Book, Jonh Wiley & Sons.
- Ferreira, E. y Garín, M. A. (2010), Estadística Actuarial: Modelos Estocásticos. Ed. Univ. País Vasco.
- Palacios, H.E. (1996), Introducción al cálculo actuarial, Ed. Mapfre, Madrid.
- Paradis, E. (2003), R para principiantes. http://cran.r-project.org/doc/contrib/rdebuts_es.pdf
- Pavía, J.M. (2011), 101 Ejercicios resueltos de Estadística Actuarial Vida, Ed. Garceta.

Additional

- Benjamin, B. y Pollard, J.H. (1980), The analysis of mortality and other actuarial statistics, Ed. Heinemann, London.
- Bowers, N. L., Gerber, H. U., Hickman, J. C. y otros (1990). Actuarial Mathematics, Society of Actuaries. Itaca, Illinois.
- De Vylder, F. E. (1997). Life Insurance Theory: Actuarial Perspectives. De. Kluwer Academic Publishers.



- Elandt-Johnson, R. C. Y Johnson, N. L. (1999). Survival Models and Data Analysis. Ed. Wiley.
- Gil Fana, J.A. Heras Martínez, A. y Vilar Zanón, J.L. (1999). Matemática de los Seguros de Vida. Ed. Mapfre.
- Newbold, P. (2008), Estadística para los negocios y la economía, Ed. Prentice Hall, Madrid.

