

Academic Year: ( 2022 / 2023 )

Review date: 30-06-2022

Department assigned to the subject: Business Administration Department

Coordinating teacher: USABEL RODRIGO, MIGUEL ARTURO

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 2

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

Algebra  
Calculus

**OBJECTIVES**

Learning objectives

The student will be able to understand and apply the theoretical models of non-life insurance.

Learning outcomes

- a) Knowledge of the parametric and non-parametric models for claims frequency and severity.
- b) Understanding and implementing model fitting concepts.
- c) Knowledge of the information theory and Bayesian techniques.
- d) Understanding the concept of over-dispersion and risk class tarification.
- e) Understanding of Monte Carlo simulation techniques.
- f) Knowledge of the basis of ruin theory.
- g) Implementation of risk mitigation techniques and optimal solvency mix
- h) Implementation of calculation algorithms in a general-purpose programming language and specific software.

Learning skills

- a) Analysis and synthesis
- b) Problem solving approach
- c) Work team player.
- d) Critical reasoning
- e) Written and verbal communication

**DESCRIPTION OF CONTENTS: PROGRAMME**

Syllabus

- I. The basic risk variables
  - a. Frequency models.
  - b. Severity models.
  - c. Fitting techniques.
  - d. Study of convolutions.
  - e. The total claims process.
  - f. Computer based implementations.
- II. Bayesian tarification techniques
  - a. Information theory and the Bayesian grid.
  - b. The concept of over-dispersion.
  - c. Bayesian tarification techniques
- III. The Monte Carlo simulation and ruin theory.
  - a. Random numbers generation
  - b. The Monte Carlo gross simulation
  - c. Introduction to ruin theory
  - d. Barrier crossing problems
  - e. Computer-based algorithms.
- IV. Dynamic solvency studies
  - a. Initial reserves optimization.
  - b. Sum assured limits
  - c. Security loading
  - d. Deductibles

- e. Reinsurance
- f. Optimal solvency mix

## LEARNING ACTIVITIES AND METHODOLOGY

### TEACHING METHODOLOGY

#### I. THEORETICAL CONTENTS

- a. Classroom interactive work.
- b. Web based materials and handouts
- c. Tutorial work.
- d. Recommended international bibliography.
- e. Office hours and email interaction.

#### II. PRACTICE

- a. Examples and exercises and previous exams classroom solving.
- b. Daily students' involvement and presentations.
- c. Computer work.
- d. Debates and bringing up different standpoints on topics. Critical thinking

## ASSESSMENT SYSTEM

Final written multiple-choice exam: 100%

<b>% end-of-term-examination:</b>	100
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	0