

Academic Year: ( 2020 / 2021 )

Review date: 15-07-2020

Department assigned to the subject: Business Administration Department

Coordinating teacher: USABEL RODRIGO, MIGUEL ARTURO

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 2

**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

The evaluation system is based on the following:

- Class participation: 10%. Active participation in class, based on exercises done on the blackboard. In case of no active participation, the grade will be accumulated to the exam or the student can do an individual simulation on Excel-BVA.
- Tests based on each topic: 30%.
- Written exam: 60%.

<b>% end-of-term-examination:</b>	60
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	40