

Academic Year: (2024 / 2025)

Review date: 09-05-2024

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

% end-of-term-examination:	100
% of continuous assessment (assignments, laboratory, practicals...):	0
Final written multiple-choice exam: 100%	