

## Survival Models

Academic Year: ( 2022 / 2023 )

Review date: 10-05-2022

Department assigned to the subject: Business Administration Department

Coordinating teacher: USABEL RODRIGO, MIGUEL ARTURO

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 1

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

Algebra  
Calculus

## OBJECTIVES

Learning objectives

The student will be able to understand and apply biometric models and statistical techniques to study human lifespan and medical research.

Learning outcomes

- a) Understanding the main features involved in biometric models of human survival.
- b) Considering the use of data censoring in the model calibration.
- c) Knowledge of the most relevant techniques applied to medical research and experiment design: Kaplan-Meier and Nelson-Allen.
- d) Understanding a multi-state model involving concurring risks such as various types of death and disability and critical sickness.
- e) Master the graduation and data analysis techniques involved in mortality tables generation.
- f) Implementing and calibrating models starting from raw data using general purpose 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. Basic concepts
  - a. Lifespan random variables.
  - b. Hazard rates
  - c. Intro to mortality tables.
  - d. Interpolation techniques
  - e. Medical research models.
  - f. Data censoring
- II. Multi-state and concurring risk models
  - a. Competing risks models
  - b. Cohort models
- III. Data Analysis and model calibration.
  - a. Central mortality rates
  - b. Graduation
  - c. From-data-to-analysis approach
  - d. Software implementation

## 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 exam: 100%

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