Stochastic models

Lecturers
Maarten JANSEN (Coordinator) and Jennifer ALONSO GARCIA

Course mnemonic
STAT-F407

ECTS credits
5 credits

Language(s) of instruction
English

Course period
First term

Campus
Plaine

Course content

The first part of the course is a review course on probability theory that will help the student to follow the second part of the course and other courses in stochastic calculus, probability and statistics.

In the second part of the course we study different types of processes:

1. Discrete time processes: Martingales and Markov chains
2. Continuous time processes: Markov processes, Poisson processes and Brownian motions.

Objectives (and/or specific learning outcomes)

There are two main objectives for this course. The first one is to provide some basic notions of probability theory that will help the student to follow the second part of the course together with other courses in stochastic calculus, probability and statistics.

In the second part of the course, the objective is to give the standard results on well-known processes such as Martingales, Markov processes and Brownian motions.

At the end of this course, the student will be able to

- Follow various advanced courses in Probability, Statistics and Stochastic Calculus,
- deal with some aspects of simple processes,
- modelize some practical situations using processes.

Teaching method and learning activities

We give traditional lectures based on slides and exercises sessions.

Contribution to the teaching profile

Ce document (en dehors de cette partie) est rédigé uniquement en anglais puisque le cours se donne en anglais.

Contribution au profil d'enseignement:

- S'approprier les concepts fondamentaux en probabilités et en statistique, théoriques ou appliquées.
- Acquérir des notions avancées dans certains domaines des probabilités ou de la statistique.
- Collecter des informations en vue d'établir un état de l'art d'un domaine de statistiques.
- Etre capable de modéliser des données réelles et de les analyser par les méthodes statistiques classiques.
- Choisir de façon adéquate l'analyse statistique qui convient au problème considéré.
- Etre responsable de ses affirmations.
- Pratiquer la critique relativement à la validité d'une affirmation.

Course notes

Université virtuelle

Other information

Place(s) of teaching

Plaine

Contact(s)

Maarten Jansen (maartenDOTjansenATulbDOTbe) - discrete part

Jennifer Alonso García (jennifer.alonso.garcia@ulb.be) - continuous part

Evaluation method(s)

written examination

written examination

Open question with developed answer

Evaluation method(s) (additional information)

Final exam based on theory and exercises. You have to pass both parts at the same time.

Determination of the mark (including the weighting of partial marks)

100% final exam.

Main language(s) of evaluation

English

Programmes

Programmes proposing this course at the faculty of Sciences

MA-STAT | Master in Statistics : General | finalité Research General/ unit 1

Programmes proposing this course at the Solvay Brussels School of Economics and Management

MA-ECOE | Master in Economics : Econometrics | finalité Research in Economics and statistics/unit 1