



Dipartimento di Scienze Economiche ed Aziendali

Direttore: Prof. Patrizio Monfardini

Dottorato in Scienze Economiche e Aziendali

Doctoral Program in Economics and Business

Coordinatrice: Prof.ssa Francesca Cabiddu

Topics in Stochastic Modeling

Course leader: [Massimo Cannas]

Aims of the course

[Stochastic models are commonly used to analyze systems evolving dynamically at random. The course aims to introduce stochastic models with a case-study approach, via applications in economics, business analytics and operation research]

Learning outcomes and competences

[Familiarize with the idea of stochastic process. Ability to understand business and economic applications]

Pre-requisites

[Basic concepts of probability, R language, statistics.]

Course contents and syllabus

1. Generalities on stochastic processes. Random walks. Simulation. (1 lecture)
2. Markov switching models. Markov Decision processes. Applications in market share analysis, accounts receivable and maintenance operations. (3 lectures)
3. Gaussian processes, Brownian motion. Applications to sport management, stock and option modeling and pricing. (2 lectures)

Organization of the course

The course consists of [12] hours of lectures scheduled.

The relevant materials can be found in the *Teams class* "PhD Programme in Economics and Business" following this path: Documenti/General/Class Materials/Introduction to Stochastic Models.

First year PhD students are made members by using their UniCa email account. Students can access the *Teams* application by using the same account.

The timetable of the course can be found in the Team class calendar.

Assessment method

[Written test]

Reading list

1. Jones and Smith, Stochastic processes: an introduction, Texts in statistical science, Chapman and Hall, 3rd Edition, 2018
2. Hillier and Lieberman, Introduction to Operations Research, 11th Edition, McGraw Hill, 2021
3. Additional references will be given in class.

Other information

[none]