



Exchange programme Vrije Universiteit

Vrije Universiteit Amsterdam - Exchange programme Vrije Universiteit - 2020-2021

Advanced Simulation for Finance, Economics and Business

Course Code	E_EOR3_ASFEB
Credits	6
Period	P5
Course Level	300
Language Of Tuition	English
Faculty	School of Business and Economics
Course Coordinator	prof. dr. B.F. Heidergott
Examiner	prof. dr. B.F. Heidergott
Teaching Staff	
Teaching method(s)	Study Group, Lecture

Course Objective

Students learn how to model real-life problems by discrete-event models. After successful completion of this course, students will be able to conduct Monte Carlo simulation based analysis of a problem and provide an output analysis. Students learn how to apply simulation in optimization and learning, and to report on their findings.

Course Content

This course gives a treatment of the important aspects of advanced Monte Carlo simulation and its applications in areas such as inventory control, project planning, reliability, risk analysis, multi-agent models, and financial models. The emphasis is on modeling the stochastic dynamic system as a discrete event system, and analyzing and improving its performance by means of discrete event simulation. The topics covered include generating random numbers, variance reduction methods, Markov chain Monte Carlo methods, selecting input distributions, and model validation. The course also teaches the statistical output analysis and the use of simulation in optimization and learning.

Teaching Methods

Combined lectures and tutorials

Method of Assessment

Final exam – Individual assessment
Individual assignment - Individual assessment

Entry Requirements

Numerical Methods (or comparable course)

Literature

The essential literature is provide during the lectures.

Recommended literature is

Chapters 1,2,5,6,7,8,9 of [Averill Law: Simulation Modeling and Analysis, Mc Graw Hill 4-th or 5-th ed]

Chapter 11 of [Cassandras and Lafortune: Introduction to Discrete Event Systems, Springer, 2nd ed 2008]

Recommended background knowledge

Analysis, basic probability theory, basic programming