DEPARTMENT OF MATHEMATICAL SCIENCES

MSG400   Stochastic Data Processing and Simulation, 7.5 credits
Statistisk databehandling, 7,5 högskolepoäng
First Cycle

Confirmation

This course syllabus was confirmed by Department of Mathematical Sciences on 2019-02-19 and was last revised on 2021-03-22 to be valid from 2021-03-23, autumn semester of 2021.

Field of education: Science 100%
Department: Department of Mathematical Sciences

Position in the educational system

The course is part of the Bachelor Program in Mathematical Sciences. It is also open for students outside the program who meet the course prerequisites.

The course can be part of the following programmes: 1) Mathematical Sciences, Master's Programme (N2MAT), 2) Bachelor's Programme in Mathematics (N1MAT) and 3) Complex Adaptive Systems, Master's Programme (N2CAS)

Main field of studies	*Specialization*
Mathematical Statistics	G1F, First cycle, has less than 60 credits in first-cycle course/s as entry requirements

Entry requirements

For entrance to the course, knowledge corresponding to the course *MSG110 Probability theory* is required.

Some programming experience is recommended - contact the examiner if in doubt about this.

Learning outcomes

The main goal of the course is to introduce the student to some important mathematical and statistical programming languages, via work on concrete mathematical and mathematical statistical problems.

After passing the course, a student should be able to

- use these programming languages as natural tools in later courses
- solve advanced statistical problems with a number of different statistical programs and programming languages
- move between analytical and numerical problem solving methods with the use of a computer
- write mathematical reports using LaTeX

Course content
The core of the course are several projects in different areas of mathematical statistics and its applications (e.g., finance, bioinformatics). Each
project contains a number of problems to be solved in a given programming language, e.g., Matlab, Python, and R. The projects are presented at lectures and programming languages are introduced during teacher led laboratories. The project reports are to be written in LaTeX.

Form of teaching
The teaching consists of lectures and computer labs.

Assessment
Written reports of the results of the work with the projects. The grading is based on how the problems in the projects are solved and reported.

Grades
The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).
The grade levels are Fail (U), Pass (G), and High Pass (VG). Students who are contractually entitled to ECTS grades should inform the examiner about this no later than one week after the start of the course. Students without such entitlement will not be awarded ECTS grades. Grades will be converted into ECTS terminology according to a standard model approved by the University President.

Course evaluation

In the middle of the course the teacher arranges a feedback discussion with the students and at the end of the course the students will be asked to answer a questionnaire. The results of the questionnaire will be processed by the teacher together with student representatives.

First Cycle