

**MSG400, STOCHASTIC DATA PROCESSING AND SIMULATION,  
7.5 credit points**

*Level: undergraduate*

---

**1. Authorisation**

The course plan has been authorised by the vice-dean of the Department of Mathematical Sciences on November 9, 2006, to be valid from July 1, 2007.

*Educational field:* Mathematical Sciences

**2. Educational context**

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.

**3. Prerequisites**

A basic course in mathematical statistics.

**4. Goals and learning outcomes**

The main goal of the course is to introduce the student to a few important mathematical software packages via work on concrete statistical and probabilistic problems.

After the course the student should

- be able to use these software packages as natural tools in later courses
- have developed problem solving skills
- be able to move between analytical and numerical problem solving methods with use of computer
- be able to write mathematical reports using LaTeX.

## **5. Course description**

The core of the course are several projects in different areas of mathematical statistics and its applications, including finance, bioinformatics, and bootstrap. Each project contains a number of problems to be solved, mainly using Matlab, Mathematica, R and C-programming. The projects are presented at lectures and the softwares are introduced during teacher led laborations. To each project one of the softwares will be suited best, and the students are strongly recommended to use it. There will be one or two eligible projects for students who wish to develop more skills in R. The project reports in LaTeX have to be handed in at the end of the course.

## **6. Literature**

See separate list.

## **7. Assessment**

The grading of the student's performance is based on how problems are solved and the written report.

## **8. Grades**

The grade levels are Fail (U), Pass (G), and High Pass (VG). A wish for an ECTS grade should be reported to the examiner at the beginning of the course.

## **9. 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.

## **10. Additional information**