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 a part of the Masters Program in Mathematical Sciences and is also open for students outside the program who meet the course prerequisites. In addition, the course is intended to be suitable for graduate students in applied mathematical sciences as well as from other fields in science.

3. Prerequisites.
An undergraduate course in mathematical statistics. Students with a strong mathematical background do not need a mathematical statistical background, as might not graduate students from other fields in science - please contact the examiner for advice.

4. Goals and learning outcomes.
Calculus, including integration, differentiation, and differential equations are of fundamental importance for modelling in most branches on natural sciences. However, these tools are insufficient to model a large number of phenomena which include ”chance” or ”uncertainty”. Examples of such phenomena are noise disturbances of signals in engineering, uncertainty about future stock prices in finance, and the macroscopic result of many microscopic particle movements in natural sciences. Among the most important tools required for the modelling of the latter phenomena are stochastic analysis and stochastic differential equations. The course gives a solid basic knowledge of stochastic analysis and stochastic differential equations, including background material from calculus, probability theory and stochastic processes.
5. **Course description.**

6. **Literature.**

7. **Assessment.**
Six home assignments that can be carried out individually or in groups of two students.

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.**
During the course the teachers arrange one or two get-togethers with the students, in order to get feedback on the results so far. At the end of the course the students will be asked to answer a questionnaire, the results of which will be processed by the teachers together with student representatives.

10. **Additional information.**
The course is given in English.