MASC05, Mathematical Statistics: Design of Experiments, 7.5 credits  
Matematisk statistik: Försöksplanering, 7,5 högskolepoäng  
First Cycle / Grundnivå

Details of approval  
The syllabus was approved by Study programmes board, Faculty of Science on 2007-06-14 to be valid from 2007-07-01, autumn semester 2007.

General Information  
The course is an elective course for first-cycle studies for a Bachelor of Science in Mathematics/Master of Science in Mathematical Statistics.

Language of instruction: Swedish and English

Main field of studies  
Depth of study relative to the degree requirements

Mathematics  
G2F, First cycle, has at least 60 credits in first-cycle course/s as entry requirements

Learning outcomes  
The aim of the course is that students on completion of the course should have acquired the following knowledge and skills:

Knowledge and understanding  
On completion of the course, the students are expected to:

- be able to explain and use basic methods in factorial experiments,
- be able to explain and use basic methods in analysis of variance with fixed and random effects, regression and analysis of covariance.

Skills and abilities  
On completion of the course, the students are expected to:

- be able to plan a factorial experiment,
- be able to suggest an experimental plan suitable for a given problem,
- be able to structure and analyse sets of data using a computer package and critically examine
be able to, both in written reports and orally at seminars, account for the solutions of statistical problems

Course design
Simple design with fixed and random effects. Simultaneous confidence intervals. Requirements for analysis of variance: transformations, model validation, residual analysis. Factorial design with fixed, random, and mixed effects. Additivity and interaction. Complete and incomplete designs. Randomised block designs, Latin squares and confounding. Regression and analysis of covariance.

Course implementation
Teaching consists of lectures, exercises and computer exercises. Participation in computer exercises is compulsory.

Assessment
The examination consists of written reports and active participation in the seminars.
Subcourses
0901 Design of Experiments, 7.5 hp Grading scale: Fail, Pass, Pass with distinction.

Grades
For a passing grade on the entire course a passing grade on the passed computer exercise reports and participation in compulsory parts are required. The grade is formed by weighing together the results on the parts which are included the examination.

Marking scale: Fail, Pass, Pass with distinction.

Entry requirements
For admission to the course knowledge equivalent to the courses MASA01, Mathematical Statistics: Basic Course, 15 credits and MASC01, Mathematical Statistics: Probability Theory, 7.5 credits is required.