Faculty Board of Science

MSF100 Statistical Inference Principles

7.5 higher education credits

Second Cycle

This syllabus is the binding document.

1. Confirmation

The syllabus was confirmed by the Department of Mathematical Sciences on June 1, 2009 to be valid from July 1, 2009. Field of education: Science. Responsible department: Mathematical Sciences.

2. Position in the educational system

The course MSF100, 7.5 higher education credits, is one of several single subject courses included in the two-year Masters Program in Mathematical Sciences. The course is also open for eligible students outside the program. It is further one of the courses in the post-graduate program in Mathematical statistics.

3. Entrance qualifications

The prerequisite for the course MSF100 is the equivalent of the course

- MSG 200 Statistical inference or MSA840 Statistics and data analysis

plus at least two of the courses (or similar)

- MSA100 Computer intensive statistical methods
- MSA630 Survival analysis
- MSA650 Linear mixed models for longitudinal data
- MSA200 Multivariate statistical analysis
- MSA250 Experimental design
- MSA600 Statistics in genetics.
4. Course content

The course is intended for students of the second year of master studies. This course takes an advanced and rigorous look at mathematical statistics and approaches to inference. In addition to covering central concepts and models of statistics, differing philosophical perspectives on scientific inference are discussed and compared. Main topics of the course:

- exponential families of probability distributions,
- the sufficiency and likelihood principles of data reduction,
- maximum likelihood estimators and Bayes estimators,
- EM algorithm, bootstrap,
- likelihood ratio tests and Bayesian tests,
- most powerful tests,
- interval estimators,
- asymptotic evaluation.

5. Learning outcomes

After completing the course, the student will be able to explain and apply the concepts and theorems mentioned in the course content above.

6. Required reading

List of required reading enclosed.

7. Assessment

An examination will be given at the end of the course. A student who has failed a test twice has the right to change examiner, unless weighty arguments can be invoked. For this, the student must send a written request to the board of the department.

8. Grading scale

The grades are Fail (U), Pass (G), and Pass with Distinction (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.
9. Course evaluation

Oral and/or written course evaluation will be performed. The results of the evaluation will be communicated to the students and will serve as a guide for the development of the course.

10. Additional information

The language of instruction is English unless all involved are Swedish speakers.