GÖTEBORGS UNIVERSITET

Forensic Statistics: Solving crimes and other legal problems with statistics, 4.5 hp

Course period:	Last day for application:
2014-11-03 to 2014-12-19	2014-11-03

Course leader / Address for applications:

Petter Mostad / mostad@chalmers.se

Course description (Advertisment for Ph.D. students):

The course will give an overview of forensic statistics and in particular focus on DNA evidence. The theory will include Bayesian inference, decision theory, and modeling with and inference for Bayesian networks. The course will include computer labs where we use R and various R packages for forensic inference.

The plan is to meet twice a week for 6 weeks, with an oral exam afterwards.
The exact schedule will be agreed with the participants at the first meeting.

Responsible department and other participation departments/organisations:

Mathematical Sciences

Teachers:
Petter Mostad (Course leader and main contact)
Other teachers may be involved

Examiner: Petter Mostad

GÖTEBORGS UNIVERSITET
Faculty of Science; Department of Mathematical Sciences

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Third cycle education

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1. Confirmation

The syllabus was confirmed by the Head of the Department of XXX 200X-XX-XX", 200X-XX-XX.

Disciplinary domain: Science
Department in charge: Department of Mathematical Sciences
Main field of study: Mathematical Statistics

2. Position in the educational system

Elective course; third-cycle education.

3. Entry requirements

The student should have a solid background in mathematical statistics and some experience with R.

4. Course content

Overview of the forensic statistics field. Bayesian inference and decision theory. Types and levels of evidence in criminal cases. Modelling with Bayesian Networks. Inference theory for Bayesian Networks.

The main evidence type focused on will be DNA, although examples of other evidence types will also be included. For DNA we will look at relationship inference, mutations, database searches, mixtures, and other issues.

We will use R in computer labs, and we will study computational forensic inference with the aid of various R packages.

5. Outcomes

After completion of the course the Ph.D. student is expected to be able to ...

1. Knowledge and understanding
- explain what forensic statistics encompasses, and give examples

- understand the central parts of Bayesian inference and decision theory as used in forensic statistics
- describe the most important issues when using DNA as evidence, and how these issues are dealt with in models and computation

2. Skills and abilities
- formulate statistical models for some forensic questions
- make manual computations for simple problems
- use R to do computations in some more complex cases

3. Judgement and approach
- approach forensic questions within a unified and scientific framework

6. Required reading
The reading list is supplied separate to the syllabus.

7. Assessment
The course is examined with an oral examination at the end. Attendance at minimum half the computer labs is also required.

A Ph.D. student who has failed a test twice has the right to change examiners, if it is possible. A written application should be sent to the Department.

The number of examinations is to be limited to five occasions and the number of placements is to be limited to two occasions.

In cases where a course has been discontinued or major changes have been made a Ph.D. should be guaranteed at least three examination occasions (including the ordinary examination occasion) during a time of at least one year from the last time the course was given.

8. Grading scale
The grading scale comprises Fail, (U), Pass (G)

9. Course Evaluation
The course evaluation is carried out together with the Ph.D. students at the end of the course, and is followed by an individual, anonymous survey. The results and possible changes in the course will be shared with the students who participated in the evaluation and to those who are beginning the course.

10. Language of instruction
The language of instruction is English.