**Department of Statistics**

### Syllabus
for course at advanced level

**Statistical Computation**  
**Statistiska beräkningar**  

<table>
<thead>
<tr>
<th>Course code:</th>
<th>ST743A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid from:</td>
<td>Autumn 2014</td>
</tr>
<tr>
<td>Date of approval:</td>
<td>2014-02-19</td>
</tr>
<tr>
<td>Department</td>
<td>Department of Statistics</td>
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<tr>
<td>Main field:</td>
<td>Statistics</td>
</tr>
<tr>
<td>Specialisation:</td>
<td>A1F - Second cycle, has second-cycle course/s as entry requirements</td>
</tr>
</tbody>
</table>

**7.5 Higher Education Credits**  
**7.5 ECTS credits**

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### Decision
This syllabus was approved by the Board of the Department of Statistics on February 19, 2014.

### Prerequisites and special admittance requirements
112.5 ECTS credits in Statistics, including Probability Theory, advanced level, 7.5 ECTS credits, Inference Theory, advanced level, 7.5 ECTS credits, Multivariate Analysis, advanced level, 7.5 ECTS credits, or equivalent. Swedish upper secondary school course English 6 or equivalent.

### Course structure

<table>
<thead>
<tr>
<th>Examination code</th>
<th>Name</th>
<th>Higher Education Credits</th>
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</thead>
<tbody>
<tr>
<td>11SB</td>
<td>Statistical Computation</td>
<td>4.5</td>
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<tr>
<td>12IN</td>
<td>Compulsory Exercise in Statistical Computation</td>
<td>3</td>
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</tbody>
</table>

### Course content
The course consists of two course units:

1. Statistical Computation  
2. Compulsory Exercise in Statistical Computation

The course presents some basic principles for numerical computing, numerical matrix algebra, solutions to equations, function optimization, and simulation techniques. The course also provides some background knowledge in programming.

The course contents provide knowledge and skills that are useful in statistical computing problems such as design of statistical surveys, estimation, and hypothesis testing.

### Learning outcomes
To pass the course, the student should be able to:

* demonstrate knowledge of basic principles of numerical computing
* design and organize algorithms for solving equations and function optimization
* solve statistical computing problem with help of statistical software
* carry out simulation experiments

**Education**
The teaching consists of lectures and seminars.

**Forms of examination**
a. Examination will be done by assessing the learning outcomes. Examination will comprise a written test and a written or oral report of a compulsory exercise.
b. Grading is done according to a seven-point scale related to the specified learning outcomes:
   A = Excellent
   B = Very Good
   C = Good
   D = Satisfactory
   E = Adequate
   Fx = Inadequate
   F = Totally Inadequate
c. The assessment criteria for the course will be distributed at the beginning of the course.
d. In order to pass the course, the grade E or higher is required on course unit 1 and Pass on course unit 2.
e. Students who have received the grade Fx or F on an examination are entitled to at least four additional examinations to achieve the lowest grade E as long as the course is given. If a student has received the grade Fx on the written reports but is close to passing the assignment, there may be a possibility to hand in an additional assignment. The assignment should be handed in within the given time frame and after the examiner having advised on the need to revise the assignment. Students who have received the grade E on an examination may not retake this examination in order to attempt to achieve a higher grade. Students who have received the grade Fx or F on an examination on two occasions by the same examiner have the right to request that a different examiner be appointed to set the grade of the examination. The request must be in writing and sent to the head of the department. The examination denotes all compulsory elements of the course. Every time the course is given, there should be two examination opportunities during the current semester.

**Interim**
When the course syllabus has been withdrawn, the student has the right to request examination once per semester during a period of three semesters in accordance with this syllabus. The request must be in writing and sent to the head of department.

**Limitations**
The course may not be included in a degree together with the course Statistical Computation (ST705A), 7,5 ECTS credits, the course Statistical Computation (ST725A), 7,5 ECTS credits, or equivalent.

**Required reading**
The course literature is described in an appendix to the syllabus.