

Bayesian Statistics, Second Cycle, 7,5 credits

***Bayesiansk statistik, avancerad nivå, 7,5 högskolepoäng***

<b>Course Code/Codes</b>	<b>20NA053</b>
<b>Subject Area</b>	Economics
<b>School/equivalent</b>	Örebro University School of Business
<b>Valid from</b>	2021-05-11
<b>Approved</b>	2021-05-11
<b>Revised</b>	
<b>Approved by</b>	Head of School
<b>Translation to English, date and signature</b>	2021-05-05 dnjn

## 1 Course content

- Bayesian inference theory
- Simulation methods
- Regression
- Models with latent variables
- Model checking
- Model choice.

## 2 Outcomes

### 2.1 The course in relation to the doctoral programme

The course shall primarily refer to the following intended learning outcomes for third-cycle courses and study programmes as described in the Higher Education Ordinance, i.e. the doctoral student shall demonstrate:

*Knowledge and understanding*

- familiarity with research methodology in general (part of outcome 2)
- familiarity with the methods of the specific field of research in particular (part of outcome 2)

The intended learning outcomes are listed in the same order as in the general syllabus for the programme.

### 2.2 Intended course learning outcomes

To obtain a passing grade, the doctoral student shall demonstrate:

Knowledge and Understanding

After completed studies, the student shall have

Understanding of basic concepts in Bayesian Statistics

Knowledge of the principles underlying the design of a Bayesian Statistical model

Knowledge of modern simulation based computational methods for Bayesian statistical analysis.

Competence and Skills

After completed studies, the student shall be able to

Independently formulate a suitable statistical model including the choice of prior distribution

Communicate relevant aspects of the modeling problem and the results of the statistical analysis.

Judgement and Approach

After completed studies, the student shall be able to

Critically examine, evaluate and compare Bayesian statistical models.

### **3 Reading list and other teaching material**

The following course readings and teaching material will be used on the course:

Required Reading

Gelman, Andrew et al. Third Edition

Bayesian Data Analysis

Chapman and Hall/CRC

Additional Reading

Albert, Jim 2009/2. ed.

Bayesian Computation with R

New York : Springer, 298 pages

### **4 Teaching formats**

Teaching on the course takes the following format:

Teaching consists of lectures and computer exercises.

Students who have been admitted to and registered on a course have the right to receive tuition and/or supervision for the duration of the time period specified for the particular course to which they were accepted (see, the university's admission regulations (in Swedish)). After that, the right to receive tuition and/or supervision expires.

### **5 Examination**

The course is assessed through the following examinations which will be graded separately:

Written Examination, 5 credits (Code: A001)

Individual written examination

Project, 2,5 credits (Code: A002)  
Individual written report and oral presentation

For students with a documented disability, the university may approve applications for adapted or other forms of examinations.

For further information, see the university's local examination regulations (in Swedish).

*For examinations consisting of several examination components, the following applies:* If during the course it is concluded that a doctoral student is unable to complete a certain examination component, the examiner may set a substitute assignment provided that circumstances do not reasonably allow for the course component to be completed at a later date during the run of the course.

## **6 Grades**

Examinations on third-cycle courses and study programmes are to be assessed according to a two-grade scale with either of the grades 'fail' or 'pass' (local regulations).

The grade shall be determined by a teacher specifically nominated by the higher education institution (the examiner) (Higher Education Ordinance).

To obtain a passing grade on examinations included in the course, the doctoral student is required to demonstrate that he/she attains the intended course learning outcomes as described in section 2.2. Alternatively, if the course consists of multiple examinations generating credit, the doctoral student is required to demonstrate that he/she attains the outcomes that the examination in question refers to in accordance with section 5.

A student who has failed an examination is entitled to a retake.

If an examination consists of several examination components, and a student fails an examination component, the examiner may, as an alternative to a retake, set a make-up assignment with regard to the examination component in question.

A doctoral student who has failed an examination twice for a specific course or course element is entitled, upon his/her request, to have another examiner appointed to determine the grade.

## **7 Admission to the course**

### **7.1 Admission requirements**

To gain access to the course and complete the examinations included in the course, the applicant must be admitted to a doctoral programme at Örebro University.

### **7.2 Selection**

Selection between applicants who have been admitted to doctoral programmes at Örebro University and who otherwise meet the admission requirements as listed above is made according to the following order of precedence:

If no other selection criteria are specified in this section, priority shall be given to applicants with a lower number of course credits left before the award of their degree over applicants with a higher number of remaining course credits. Should two or more students have equal number of credits,

selection will be done through the drawing of lots. This also applies within any selection groups listed unless otherwise stated.

### 7.3 Other applicants than doctoral students admitted at Örebro University

Other applicants than doctoral students admitted at Örebro University may be given access to the course on the grounds of provisions for and/or agreements regarding contracted courses, joint degrees, national graduate schools or cooperation in other respects with other universities.

Any decisions on what such other applicants may be given access to the course are made separately and on the basis of the provisions and/or agreements that occasion the student to apply for the course.

For participation in the course in other respects, the same provisions shall apply as for doctoral students admitted to Örebro University.

## **8 Transfer of credits for courses, study programmes and other experience**

Provisions on the transfer of credits can be found in the Higher Education Ordinance and on the university's webpage.

## **9 Other information**

Teaching will be held in English.

## **Transitional provisions**