ÖREBRO UNIVERSITET

Course syllabus
Third-cycle courses and study programmes

This is a translation of a Swedish document. In the event of a discrepancy, the Swedish-language version shall prevail.

Quantiative research methods, 7,5 credits

Kvantitativ forskningsmetodik, 7,5 högskolepoäng

Course Code/Codes	20KFM13
Subject Area	Statistics, cross-disciplinary course
School/equivalent	Business School
Valid from	2016-01-18
Approved	2016-01-21
Revised	
Approved by	Sven Helin
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1 Course content

Part 1: Statistical thinking
The first part of the course aims at creating understanding for random variation and statistical reasoning and introduces basic statistical concepts. Random variation is the basis for all statistical analysis and also the reason why we need statistical methods in order to discern patterns, see connections and make decisions under uncertainty.

Part 2: Analyzing causal relationships
Statistical methods are descriptive in nature, they can describe how different aspects of the studied subject vary together – that unemployment tends to be high when GDP growth is low or that the temperature tends to be high when the CO_2 concentration is high. More is required in order to make statements about causality. A randomized experiment is one possibility where random variation is used in a deliberate way to isolate the effect of different treatments from all other factors that can influence the response. When it is not possible to conduct randomized experiments additional assumptions are required – a model describing the possible causal relationships. Students will work with their own data sets or data sets closely related to their research field.

Course part 3 Statistical analysis methods
Several frequently applied statistical models for analysis are introduced. The choices of model and method are made conditionally on the prerequisites for the analysis. What variables are involved, how are they measured, are there dependencies among study variables, is data in form of a cross section sample,

time series or in a panel form, what is the sample size, etc.? Due to the differences among the kind of populations studies within different research areas, one method may be frequently applied in one research area, while another method is preferred in another. Knowledge of alternative statistical models and methods then those customarily applied within ones research area yield ability to enlighten and study problems in new ways and potential to seize new opportunities. Within the course part students work with their own data sets or data sets closely related to their research field.

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
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- 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)

Competence and skills
- the capacity for scholarly analysis and synthesis (part of outcome 3)
- the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively (part of outcome 4)
- the ability to plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames (part of outcome 4)
- the ability to review and evaluate research and other qualified tasks (part of outcome 4)

Judgement and approach
intellectual autonomy and disciplinary rectitude (part of outcome 9)

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:

The aim of the course is to give the research student primary
- understanding of statistical theory and methodology and its application in statistical surveys and analyses
- ability to conduct basic statistical surveys, calculations and analyses
- and a deeper understanding of statistical methods relevant for the students research area.

On completion of the course, the research student shall have
- knowledge of and an understanding of primary probability theory and statistical inference theory
- ability to apply relevant basic statistical methods for data analysis
- ability to use statistical software.

3   Reading list and other teaching material

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

<u>Required Reading</u>
Agresti, Alan and Barbara Finlay (2009), Statistical methods for the social sciences (Fourth Edition), Pearson Education International, Pearson, Prentice Hall, Upper Saddle River, New Jersey.

Moore, David S. and William I. Notz (2006), Statistics – Concepts and controversies (Sixth edition), W.H. Freeman and Company, New York.

<u>Additions and Comments on the Reading List</u>
Additional literature is chosen with respect the research problem of interest to the participating research students.

4   Teaching formats

Teaching on the course takes the following format:

Lectures, seminars and computer labs.

The course is taught in English.

5   Examination

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

Examination is carried out through two written assignments of 2.5 and 5 credits where the latter is also presented at a mandatory seminar.

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:

Priority is given to applicants for whom the course is obligatory.

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

Transitional provisions