LINKÖPINGS UNIVERSITET

Quasi-Experimentation and Statistical Analysis

729G88

Bachelor's Programme in Cognitive Science

Course coordinator: Erik Marsja

Examiner: Rachel Ellis

Administrator: Carl Löfstrand

Time period: week 46, 2024 – week 2, 2025

LINKÖPING UNIVERSITY
FACULTY OF ARTS AND SCIENCES

Contents

Introduction

This course covers topics related to the use of quasi-experimental designs in research. Specifically, the course covers:

- design of quasi-experimental research studies based on advanced quantitative methods
- validity and reliability
- statistical analyses with two or more variables, in particular ANOVA & multiple regression analysis
- critical analysis of scientific texts
- writing scientific texts
- applied ethics

On completion of the course, you will be able to:

- design a quasi-experimental study based on a research question
- conduct a quasi-experimental study in an ethically correct way
- analyse data from a quasi-experimental study
- interpret results from a quasi-experimental study

This course builds on the basics of research methods and statistics that were introduced on the course 'Forskningsmetodik och statistik' (729G48), and provides knowledge and skills that can help you in future research work, for example that conducted for your bachelor thesis (729G40).

Course syllabus

The course syllabus can be found here: https://studieinfo.liu.se/en/kurs/729g88#syllabus

Types of teaching and working

Teaching will take the form of lectures, seminars, lab classes and group work in the form of 'journal clubs'. Students are expected to work independently, both alone and in groups.

NOTE: 6 HP = 160 hours of work
Timetabled = 32 hours
Independent study = 128 hours

Lectures

During the course, a number of lectures will be held. Attending the lectures will help you with the assignments, but it is not obligatory. In some cases, preparation is required before the session, and additional reading after the lectures is recommended – further details will be given at the course introduction. The lectures provide an introduction to the topics listed below, which have been selected to provide the theoretical basis needed to achieve the intended learning outcomes.

The following lectures are planned:

Lecture 1 – Course Introduction

Lecture 2 – Statistics refresher

Lecture 3 – Critical analysis of articles

Lecture 4 – ANOVA 1

Lecture 5 – ANOVA 2

Lecture 6 – Regression 1 (including mid-course evaluation)

Lecture 7 – Regression 2

Lecture 8 – Writing a scientific report

Lecture 9 – Q & A

Lab classes

Two lab classes will be held. Here you will use the programme Jamovi to analyse and visualise data, skills required to meet the intended learning outcome 'analyse data from a quasi-experimental study'. Jamovi can be downloaded for free from this website: https://www.jamovi.org/download.html

Attending the lab classes will help you with the assignments, but it is not obligatory. The following classes are planned:

Jamovi lab 1 - ANOVA

Jamovi lab 2 - Regression

Journal Clubs (mandatory!, 1HP – active participation in the seminars, U/G; 1HP – individual written assignment, U/G)

You will be split into groups. Each person in the group will be responsible for leading one session, and actively participating in the remaining three sessions. Active participation means taking part in discussions and asking at least two questions about every article. The session leader is responsible for choosing a scientific article and sending to the other members of the group at least one week before the session. The article should be an original research article from a peer-reviewed scientific journal. The session leader should present the article to the group and lead the subsequent discussion. After the session, the session leader needs to write a report (3-4 pages, submitted via Lisam) consisting of a critical analysis of the article, with a short summary of, and reflection on, the group discussion. In addition, please include a list of the questions that were asked by each group member (including who asked which questions). To pass this assignment, it is necessary to demonstrate that you are able to critically analyse, not just summarise, your chosen article. Note that you are only required to submit one written assignment (when you are the session leader), but you are required to attend, and actively participate in, all four sessions. If you are unable to attend any of the sessions, a supplementary assignment must be submitted – further details will be provided at the course introduction. The journal clubs contribute to achieving all of the intended learning outcomes of the course.

Project report (4 HP, ECTS)

The final report will take the form of a scientific article. The article will be written in pairs, and will be based on a dataset that will be provided on Lisam. Using the data and an accompanying description of the dataset, each pair will formulate at least three research questions, on which the report will be based. The project report contributes to achieving all of the intended learning outcomes of the course. Further details will be provided during the course.

Deadlines:

-By Friday 22nd November, 17:00: Email Rachel (rachel.ellis@liu.se) with details of who you will work with

-On Tuesday 26th November: Instructions for the assignment (including grading criteria) will be available on Lisam

-By Tuesday 10th December, 17.00: Your three research questions to be submitted via Lisam

- By Wednesday 8th January, 17:00: Report to be submitted via Lisam.

- Thursday 9th January, 12:00: Opposition schedule will be available on Lisam.

- Wednesday 15th January,10:15-12:00: Opposition seminar to take place.

- By Friday 17th January, 17:00: Revised reports to be submitted via Lisam.

Examination and grades

The purpose of the examination is for students to demonstrate that they can use the knowledge and skills defined in the learning objectives.

The course is examined by:

• project work (in pairs; see 'project report' above for details) with written and oral presentation, grading scale: ECTS, PRO1, 4HP

• individual written assignment (see 'journal club' above for details), grading scale: Pass/fail UPG1, 1HP

• active participation in seminars (see 'journal club' above for details), grading scale: Pass/fail OBL1, 1HP

To pass the course, you must pass all three parts. Each part has been designed to cover all of the intended learning outcomes of the course. The final grade is based on the project work. The course is graded using ECTS grades, A-F. None of the examination tasks are anonymous.

Students failing an exam covering either the entire course or part of the course twice are entitled to have a new examiner appointed for the reexamination. Students who have passed an examination may not retake it in order to improve their grades.

Course evaluations

After every completed course, students can give their opinion on the course through Evaliuate, the LiU-wide system for course evaluation. By doing this, you contribute to raising the quality of your course/programme, and thereby raise its status.

How will the course be evaluated?

As the course draws to an end, you can access the Evaliuate survey in Lisam. The survey opens two weeks before the end of the course and will remain open for four weeks. When the course evaluation period is over, you will receive a summary of the results. See also information in Lisam:https://liuonline.sharepoint.com/sites/Lisam/SitePages/en/Kursv%C3%A4rderingar.aspx and in Liunet for students https://liuonline.sharepoint.com/sites/student-rattigheter-och-skyldigheter/SitePages/en/Studentinflytande.aspx

A mid-course evaluation will be held on 4th December – this will be based on discussion points that you raise. If you have any questions or suggested improvements during the course, please contact Rachel or Erik.

Results from previous course evaluations in *Evaliuate*

The previous course received a mean overall rating of 4.14/5. A few minor changes have been made to make particular sessions clearer, but no major changes have been made to the course this year.

Referencing

APA referencing is used as standard in this course. A useful guide can be found here: https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_style_introduction.html

For more information, please see the library's information pages on reference styles, quoting, referencing and copyright at Liunet for students: https://liuonline.sharepoint.com/sites/student-under-studietiden/SitePages/en/Skriva-och-referera.aspx

Feedback

Feedback will be given in writing within 15 working days of the deadline for each examination task.

Course literature

We recommend the books listed below, but you can use other resources if preferred.

Kjellberg, Anders, Sörqvist, Patrik, (2020) Experimentell metodik för beteendevetare, (tredje uppl.). Studentlitteratur, Lund
ISBN: 9789144140063

Borg, E & Westerlund, J (2021) Statistik för beteendevetare : faktabok (tredje uppl.). Liber, Stockholm.
ISBN: 9789147129409

Field, Andy, (2018) Discovering statistics using IBM SPSS statistics, fifth ed. (4th edition also ok), Los Angeles: London: Sage, ISBN: 9781526419521, 9781526419514, 9781526422989

A list of articles and book chapters recommended or required for each session can be found on Lisam. When reading is required before a session, this is also mentioned on the course timetable.

Teachers

The following teachers are involved in the course:

- Erik Marsja, IBL, erik.marsja@liu.se, course coordinator & lecturer
- Rachel Ellis, IBL, rachel.ellis@liu.se, examiner & lecturer
- Cristina Tobías Figuerola, IBL, cristina.tobias@liu.se, lecturer

Cheating, plagiarism

Cheating and plagiarism are not allowed! See below for the definitions used in this course. If a teacher suspects cheating or plagiarism, they are duty-bound to report it to the university disciplinary board.

Further information can be found here https://liuonline.sharepoint.com/sites/student-under-studietiden/SitePages/Fusk-och-plagiat.aspx

What is cheating?

Cheating is defined as the use of prohibited aids (including use of AI outside the scope defined in appendix 1) or attempts to deceive in another way during exams or any form of assessment of study performance. Prohibited collaboration in work that should be completed by an individual is also considered to be cheating.

What is plagiarism?

Plagiarism is a form of cheating which involves presenting someone else's material as your own by for example using another author's text and replacing only a few words with synonyms, changing the word order or grammar.

Ouriginal – a tool for countering plagiarism

Assignments will be submitted to Ouriginal in order to assist in detecting plagiarism.

Timetable

The timetable for the course can be found in TimeEdit and in the LiU app.

Information can be found here https://liuonline.sharepoint.com/sites/student-under-studietiden/SitePages/en/schema.aspx

Lisam (Course information)

Course information (schedule, course syllabus and course documents etc.) can be found in the course room at Lisam, where you will also find this study guide. To find your course/programme room at Lisam, you must have an active LiU ID and be registered on the course in question.

The course room can be found here:
https://liuonline.sharepoint.com/sites/Lisam_729G88_2024HT_TF

Tips for students

- you can set alerts to keep updated on any changes made in the course room. Information on how to so can be found here:

https://liuonline.sharepoint.com/sites/Lisam-support/SitePages/en/Aviseringar.aspx

- Student manuals and FAQ for Lisam can be found here: https://liuonline.sharepoint.com/sites/Lisam-support/SitePages/en/Manualer.aspx

Other information

If you have questions about course content

Questions can be discussed using the discussion board on Lisam (”diskussionsforum”). Please start a new thread for each question. We encourage you to answer each other’s questions where possible. Teachers will check twice a week (on Tuesday and Thursday) and will answer any remaining questions.

Liunet for students

Liunet student has further information that may be useful for you as a student. You can find information on e.g.:

- Rights and obligations
- International opportunities
- Campus and premises
- Student support during your studies

You can find Liunet for students here
https://liuonline.sharepoint.com/sites/student/SitePages/en/Home.aspx

Studying with disabilities

If you wish to apply for targeted study support, please contact LiU’s coordinator for students with disabilities. You can find contact details and information here
https://liuonline.sharepoint.com/sites/student-stod-och-kontakt/SitePages/en/Studera-med-funktionsnedsattning.aspx

Sound and image recording in teaching situations

The decision on guidelines for students in relation to sound and image recording in teaching situations can be found here https://styrdokument.liu.se/Regelsamling/VisaBeslut/622637 (only in Swedish). The basic principle is that recording (audio and/or visual) and photography are not allowed, unless the student has received permission from the teacher responsible for the session in question.

Study guidance service

If you need guidance concerning your studies and the future labour market, you can contact the study advisers at the Faculty of Arts and Sciences. Contact details and information on appointments and how to book one can be found here:

https://liuonline.sharepoint.com/sites/student-stod-och-kontakt/SitePages/en/studievagledning-filosofiska-fakulteten.aspx

Appendix 1

Use of AI is allowed, to a limited extent, according to the parameters described below. Colour markings (green, yellow and red) indicate whether the use of AI is permitted or not. The basic principle is that AI can be used for feedback on your texts, but it is not permitted to use AI to generate text on your behalf. If you choose to use AI in your work, it is important that you describe precisely how you have used it in an appendix to your work. Use of AI outside the parameters described as permitted here, or use of AI that has not been accurately and thoroughly described in an appendix to your work is not allowed and will be considered cheating.

Student	Generative AI
Writes the entire work themselves.	Not used.
Generates an idea and writes the work, revises based on feedback.	Used for feedback on the student's written text or idea.
Uses AI as sounding board and writes the work. Revises based on feedback.	Used to generate or suggest multiple ideas and for feedback on the student's written text.
Uses AI as sounding board, takes AI-generated drafts and rewrites them using their own words.	Used to generate ideas and one or multiple text drafts.
Uses AI to generate ideas and multiple text drafts. Takes parts of these and merges into a text and revises.	Used to generate ideas and one or multiple text drafts.
Uses AI to generate the work. Reads, reviews and revises the text before submission.	Used to generate the entire work.
Uses AI to generate the work. Submits unedited work.	Used to generate the entire work.