Course handbook

Advanced statistical methods, 6 hp

729A25

LINKÖPINGS UNIVERSITET

VT 2022 (v. 13 – v. 22)

Course leader: Rachel Ellis & Emil Holmer
Examiner: Emil Holmer
Administrator: Carl Löfstrand
Revised: 03/17-22

INTENDED LEARNING OUTCOMES
On completion of the course, the student should be able to
- choose, motivate, and critically evaluate statistical analysis methods in relation to research questions
- perform, interpret, and report analysis of variance, regression analysis and factor analysis on an appropriate data set
- perform, interpret, and report one of the above-mentioned analysis methods on a provided data set
- describe and perform statistical analysis methods so that they are reproducible

COURSE CONTENT
The following is studied in the course
- choice of analysis methods
- analysis of variance
- regression analysis
- factor analysis
- interaction effects
- reproducibility of analysis
- open data
- presentation of results in journals

EXAMINATION
The course is examined through two written assignments, the first corresponding to 4 credits (U, G, VG), and the second 2 credits (U, G, VG). To pass the course, you must pass both written assignments. To get VG on the course, you need to get VG on both assignments.

GRADES
Three-grade scale, U, G, VG.

TEACHING AND WORKING METHODS
The course will take place on Campus (unless restrictions so forbid). Teaching will take the form of lectures and a Q&A seminar. Students are expected to work independently.

NOTE: 6 HP = 160 hours of work
Timetabled = 12 hours
Independent study = 148 hours

Lectures and seminar
During the course, five lectures will be held, and one Q&A session. Attending the lectures and the seminar will help you with the written assignments, but it is not obligatory. Schedule:

Lecture 1, March 31 – Course introduction & Statistics refresher (Emil Holmer, Rachel Ellis)

Lecture 2, April 7 – Analysis of Variance (Rachel Ellis)

Lecture 3, April 14 – Regression analysis (Rachel Ellis)

Lecture 4, April 21 – Factor analysis (Rachel Ellis)

Written report 1 (4 hp)

The first written report will take the form of three different analyses (i.e., regression, ANOVA with an interaction effect, and factor analysis), each motivated by a research question and described in such detail that they are possible to reproduce exactly as originally performed. For a detailed description of the assignment, see separate document on Lisam.

Written report 2 (2 hp)

The second assignment is a written report where you replicate the analyses and results of a course mate from Written report 1. In addition, the assignment includes essay questions. For a detailed description of the assignment, see separate document on Lisam.

PLAGIARISM

Plagiarism is not allowed. See the following website for details of LiUs policy on plagiarism (including definitions), and for links to other useful resources:
https://liu.se/en/article/plagiering-upphovsratt

Written assignments will be analysed for possible plagiarism using the web-based service 'Urkund'.

COURSE EVALUATION

The course will be evaluated via an EvaLiUate form, which will be sent out at the end of the course. Your opinions are important, so please remember to fill it in! If you have any questions or suggested improvements during the course, please contact Emil.

PRACTICAL INFORMATION

Course leader:	Rachel Ellis, rachel.ellis@liu.se
	Emil Holmer, emil.holmer@liu.se
Examiner:	Emil Holmer
Course administrator:	Carl Löfstrand, carl.lofstrand@liu.se,
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Program administrator:	Anna Grabska Eklund, anna.grabska.eklund@liu.se,
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LITERATURE

See Lisam for articles and useful resources.
Recommended, not required:
Borg, E., & Westerlund, J. (2021). *Statistik för beteendevetare: faktabok* (fjärde uppl.). Stockholm: Liber. ISBN: 9789147129409
          OR
Field, A. (2017). *Discovering statistics using IBM SPSS statistics* (5th ed.). London: Sage. ISBN: 9781526419521, 9781526419514, 9781526422989
Earlier editions of the books are also fine.

The following book, that can be downloaded for free, may be useful when running the analyses:

Navarro, D. J., & Foxcroft, D. R. (2019). *Learning statistics with jamovi: a tutorial for psychology students and other beginners* (Version 0.70). DOI: 10.24384/hgc3-7p15 [Available from url: http://learnstatswithjamovi.com]