

Syllabus: Statistics 1

The aim of the course is to provide skills for interpreting and doing data analysis, with a particular focus on regression models. Practical skills, using the statistical software R, is trained in a combined group and individual assignment involving a full data analysis of a given data set. A satellite course entitled “learn R by EXample” (REX) is included, to get started with R.

Course code

Master program: PSMT59; Doctoral program: PS303F. It is the same course given at two levels, the only difference is examination criteria and grades.

Prior knowledge

The course assumes prior knowledge corresponding to the content of Borg & Westerlund (2012). *Statistik för beteendevetare (3 ed.)*. Stockholm: Liber.

Learning outcomes

After completing the course, you will have improved your ability to:

- manage data: screening, cleaning, sharing,
- summarize and visualize data,
- interpret and derive point estimates and compatibility intervals,
- understand and apply linear and logistic regression models,
- plan and conduct statistical analyses of data, including data management, data screening, descriptive analysis, data visualization, and effect size estimation.
- use the software R for analyzing real (and simulated) data
- follow Open Science practices

Course content

The course will cover the following topics:

- Data management and data screening
- Descriptive statistics and data visualization
- Parameter estimation with compatibility intervals
- Linear and logistic models
- Practical data analysis using R
- Open Science

Activities

The course consists of lectures, seminars, and group discussions linked to the individual assignment. Teaching will take place in *real life* with no or limited possibilities for online participation.

The course consists of lectures and computer exercises. One seminar is devoted to the student's presentations of their individual assignments.

Group assignment

Group task: (1) Plan and conduct analyses of a selected data-set. Several data sets will be available. (2) Prepare a slide-show presentation of your analysis, and (3) Present it at the last seminar (joint presentation of group members).

Deadline: 16.00 the evening before the presentation seminar.

Examination

The written exam is scored 0 to 30 points. The group assignment is scored pass or fail (= revise), but up to 3 points may be awarded for excellence and be added to the exam score of each group participant. Together, the written examination and the individual assignment may give a *total score* of at most $30 + 3 = 33$ points.

Grading Master level (PSMT59). The course is graded on the seven-point ECTS-scale (A, B, C, D, E, Fx, F). Grade A requires a *total score* of at least 27 points, B 24-26 points, C 21-23 points, D 18-20 points and E 15-17 points (F: < 15 points). In addition, grades A-E requires passed group assignment.

Grading Doctoral level (PS303F). The course is graded “pass” or “fail”. Grade “pass” requires a *total score* of at least 21 points. In addition, grade “pass” requires passed group assignment.

Literature

Reference	Abbrvtn	No of pages
Gelman, A., Hill, J., and Vehtari, A. (2021). <i>Regression and Other Stories</i> . Cambridge: Cambridge University Press. ISBN: 9781107676510. available online: https://users.aalto.fi/~ave/ROS.pdf Selected parts of chapters 1-5; 6-8, 10-12, 13-14, and appendix A and B. See reading instructions posted on Athena	ROS	350
Wilkinson L. & the APA Task Force on Statistical Inference (1999). Statistical methods in psychology journals. Guidelines and explanations. <i>American Psychologists</i> , 54, 594-604. www.apa.org/pubs/journals/releases/amp-54-8-594.pdf	W	11
Amrhein, V., Greenland, S., & McShane, B. (2019). Scientists rise up against statistical significance. <i>Nature</i> , 567, 305-307. doi.org/10.1038/d41586-019-00857-9	A	3
Nilsson, M.E. (2024). Lecture notes. Link posted on <i>Athena</i> .	MN	NA

Schedule: see Canvas