



Processing and analysis of Biological data BIOS14, 5 Nov., 2018 - 18 Jan., 2019

Department of Biology, Lund University

Course aims: To gain a basic understanding of statistical and probability theory, be introduced to the most commonly-used statistical methods within biology, to understand the assumptions associated with each statistical test, to gain practical experience in using these tests in either SPSS or R, and to learn how to choose the appropriate test for a given dataset.

Literature: Gerry P Quinn and Michael J Keough. 2002. Experimental Design and Data Analysis for Biologists, Cambridge University Press. Dessutom rekommenderas: Getting Started with R - An introduction for biologists (2012), Beckerman and Petchey, ISBN: 978-0-19-960162-2

Course leader: Jessica Abbott, jessica.abbott@biol.lu.se

Other Teachers: Per-Erik Isberg

Location: see web schedule at L@L

[Learning platform: L@L](#)

Teaching activities: L (lecture), E (exercise), Exam

Compulsory activities are marked with C. If you are absent from a compulsory activity without a valid reason you are not guaranteed to complete this part until the next time the course is offered. A valid reason is e.g. that you are ill, but not that you are travelling!

Before the start of the course you must read the documents "general information" and Plagiarism and Cheating

[General information](#)

[Plagiarism and Cheating](#)

Additional information for students can be found at

[Current student at LU](#)

[Current student at Dept. of Biol.](#)

[Students rights and guidelines](#)

| Date | Time | Activity | Compulsory (mark w. C) | Description | Teacher |
|-------------|-------------|----------|---------------------------|---|---------|
| Mo. 5 Nov. | 9.30-10.00 | L | C | Introduction to course, compulsory | JKA |
| | 10.15-12.00 | L | | Introduction to R | JKA |
| | 13.15-16.00 | E | | Introduction to R (exercise) | JKA |
| Tu. 6 Nov. | 9.15-12.00 | L | | Introduction to statistics | PEI |
| | 13.15-16.00 | E | C | General introduction to software | JKA |
| Mo. 12 Nov. | 9.15-12.00 | L | | Binomial and Poisson distribution | PEI |
| | 13.15-16.00 | E | C | File and data manipulation | JKA |
| We. 14 Nov. | 9.15-12.00 | L | | Estimation, normal distribution, CGS | PEI |
| | 13.15-16.00 | E | C | Descriptive statistics and graphs | JKA |
| Mo. 19 Nov. | 9.15-12.00 | L | | Hypothesis testing and power analysis | PEI |
| | 13.15-16.00 | E | C | Hypothesis testing and power analysis | JKA |
| We. 21 Nov. | 9.15-12.00 | L | | Regression | PEI |
| | 13.15-16.00 | E | C | Linear regression, model I and II | JKA |
| Mo. 26 Nov. | 9.15-12.00 | L | | Multiple and non-linear regression | PEI |
| | 13.15-16.00 | E | C | Multiple and non-linear regression | JKA |
| We. 28 Nov. | 9.15-12.00 | L | | One-way ANOVA | PEI |
| | 13.15-16.00 | E | C | ANOVA, testing assumptions, power | JKA |
| Mo. 3 Dec. | 9.15-12.00 | L | | Multifactor ANOVA | PEI |
| | 13.15-16.00 | E | C | Two-way ANOVA and mixed models | JKA, JW |
| Tu. 4 Dec. | 9.15-10.00 | L | C | Introduction to mid-term exercise | JKA |



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|-------------|-------------|------|---|--|---------|
| | 10.00-12.00 | E | C | Individual work on exercise | JKA, JW |
| | 13.00-14.00 | E | C | Individual work on exercise | JKA, JW |
| | 14.00-15.00 | E | C | Feedback groups | JKA, JW |
| | 15.00-16.00 | L | C | Discussion session | JKA |
| We. 5 Dec. | 9.15-12.00 | L | | Block designs and repeated measures | PEI |
| | 13.15-16.00 | E | C | Nested models and block designs | JKA, JW |
| Mo. 10 Dec. | 9.15-12.00 | L | | Analysing frequencies | PEI |
| | 13.15-16.00 | E | C | Repeated measures and ANCOVA | JKA, JW |
| We. 12 Dec. | 9.15-12.00 | L | | GLM and logistic regression | PEI |
| | 13.15-16.00 | E | C | χ^2 -tests, G-tests and logistic regression | JKA, JW |
| Mo. 17 Dec. | 9.15-12.00 | L | | Multivariate analysis: Clusters, PCA and Discriminant Analysis | PEI |
| | 13.15-16.00 | E | C | Cluster analysis, PCA and Discriminant Analysis, MANOVA | JKA, JW |
| We. 19 Dec. | 9.15-12.00 | L | | Survival analysis | PEI |
| | 13.15-16.00 | E | C | Survival analysis | JKA, JW |
| Sa. 22 Dec | | | | Winter Break | |
| Su. 6 Jan | | | | Winter Break | |
| Mo. 7 Jan. | All day | Exam | | Exam is posted on Live@Lund | JKA |
| Su. 20 Jan. | All day | Exam | C | Exam is due, send to JKA via email | JKA |