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1 Course overview and goals

This course is designed to

2 Textbooks (required)

1. Shravan Vasishth's statistics lecture notes.

This is an updated version of

Vasishth, S., & Broe, M. (2010). *The Foundations of Statistics: A Simulation-based Approach: A Simulation-Based Approach.* Springer.

2. Navarro, Daniel. *Learning statistics with R: A tutorial for psychology students and other beginners (Version 0.4).*

Both of these books are available on the authors' websites free of charge (see links).

Optional reading:

3. Field, Andy, Miles, Jeremy and Field, Zoë (2012) *Discovering Statistics Using R.* Sage Publications, London. ISBN 978-1446200469

4. Field, Andy (2013) *Discovering statistics using IBM SPSS Statistics: and sex and drugs and rock n roll (4th edition).* Sage Publications, London. ISBN 9781446249178

3 Course website and homework

Course materials as well as assignments will be posted on MyBU. Homework will be assigned at the end of each class and will be due at the beginning of the next class. Homework assignments will be submitted via MyBU.

4 Marking policy

Your mark will consist of three components: One short assignment (40%), one longer assignment (50%), and the homework (10%). Homework assignments will not be marked in detail; all you have to do is turn something in by the beginning of the next class in order to get a point. If you abuse this policy (e.g. by turning in an empty file), you will lose all homework points. Homework points translate into marks as follows:

Mark	Number of homework assignments turned in
80	8
70	7
60	6
50	5
40	4
30	3
20	2
10	1
0	0

5 Course Outline:

Topic	
Oct 2nd *Double class session: 10–12 am and 1–3 pm* Introduction to Advanced Statistics Introduction to the R software Introduction to the simulation approach Descriptive statistics *Readings:* *Vasishth, Chapter 1* *Navarro, Chapters 1, 3 – 5*	**1**
9th *Double class session: 10–12 am and 1–3 pm* Probability and inferential statistics Why is the normal distribution so important? Estimating population parameters from a sample Some more R basics: Plotting, reading data files, basic programming *Readings:* *Vasishth, Chapter 2* *Navarro, Chapters 6–11*	**2**
16th Hypothesis testing: z-test t-test: one-sample, two sample, unequal variances, repeated measures χ^2-test Power *Readings:* *Navarro, Chapters 12–13* *Vasishth, Chapter 3*	**3**

Topic	
23rd Analysis of Variance One-way ANOVA Comparison with SPSS Simulating violations of assumptions Multiway ANOVA Planned comparisons Linear regression Reporting statistical analyses with Knitr *Readings:* *Navarro, Chapters 14–16* *Vasishth, Chapter 4.1*	**4**
30th **Assignment 1 set** Power in ANOVAs Generalised linear model Contrast coding Repeated measures ANOVA Nonparametric tests ANCOVA *Readings:* *TBD*	**5**
Nov 6th *Reading Week, no class*	
13th Logistic regression Linear mixed models MANOVA Comparison between R and SPSS	**6**

Topic	
20th *Coursework Week, no class*	
27th **Assignment 1 due; Assignment 2 set** Class might be moved, TBD	**7**

The **second assignment** will be due on **Friday, January 30th at 12 pm**.