



053614 VU Statistics for Data Science

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Winter 2023

- ▶ **Lectures:** Mondays 11:30–13:00 (SR 4) +
+Thursdays 9:45–11:15 (PC-Room, bi-weekly)
- ▶ slides on Moodle
- ▶ **Homework/Lab sessions:** Thursdays 9:45–11:15
(bi-weekly)
- ▶ **Exception:** Homework session on Monday, October 30th
and January 29th.
- ▶ **mandatory** bi-weekly exercise presentations (Thursdays)
- ▶ grading: 50P exercises, 30P oral final exam or project
- ▶ At least 25P of all exercises completed for passing grade!



grade	points
1	80 – 71
2	70 – 61
3	60 – 51
4	50 – 41
5	≤ 40



- ▶ do the homework, upload solutions and flag solved problems (to get points)
- ▶ randomly selected students
- ▶ present homework solutions on the blackboard/beamer and bring your laptop for coding exercises
- ▶ use any programming language you like (typically R or Python)
- ▶ Your code has to run only on your machine!
- ▶ If you can't present, you lose all the points of that session!

Choose either

- ▶ an oral exam (30min) about the lectures and homework
- ▶ a final project with 15min presentation and questions

- ▶ What is data science? What is statistics for data science?
- ▶ \Rightarrow learn classical concepts through modern challenges of statistics
- ▶ Statisticians, mathematicians, computer scientists, natural scientists and engineers from all around the world meet in one class room
- ▶ \Rightarrow self assessment test (Moodle)
- ▶ **mandatory** but does not count towards your grade
- ▶ do it no later than **Thursday, October 5, 9:45am.**

WHAT TYPE OF COURSE IS THIS?



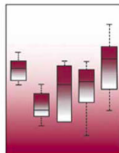
- ▶ Part of the core theoretical section of DS Master program:
 - ▶ Introduction to Machine Learning (645, 910)
 - ▶ Mathematics for Data Science (645)
 - ▶ Optimisation Methods for Data Science (645)
 - ▶ **Statistics for Data Science** (645, 910)
- ▶ Analyze and understand statistical properties of classical and modern methods mathematically and by simulations.
- ▶ Prerequisites:
 - ▶ Basics of analysis and linear algebra
 - ▶ Basics of probability theory
 - ▶ Basics of statistical inference (very helpful)
 - ▶ No fear of formal mathematical manipulations
 - ▶ Working knowledge of some statistical programming language (R, Python)

WHAT WE WILL COVER...



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1. Introduction: Data and models (statistical thinking)
2. Simulation and bootstrap methods
3. Linear models
4. Inference for network data
5. Differential Privacy



Mathematical Statistics and Data Analysis

THIRD EDITION

John A. Rice

DUXBURY ADVANCED SERIES

YOUR NEXT TASKS (MOODLE!!!)



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- ▶ Do the self assessment test (until Thursday!).
- ▶ Check out the first exercise problem set this week.
- ▶ Upload your solutions and flag those problems you have been able to solve (until Wednesday, Oct. 11th).



How to get in touch:

- ▶ lukas.steinberger@univie.ac.at
- ▶ office hours: by appointment (Oskar-Morgenstern-Platz 1, Room 6.610)
- ▶ Open Moodle forum!

Hope you can enjoy this course!!!