

Methods 3: Multilevel Statistical Modeling and Machine Learning

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Autumn 2023

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Description of qualifications

The purpose of the course is to further develop students' knowledge and skills in statistics and programming.

The course includes instruction on statistical techniques relying on the Generalised Linear Model, including multilevel modelling and basic machine learning procedures (e.g. predictive approaches and validation techniques). The course includes lectures on statistical and machine learning concepts as well as practical exercises in programming.

This course builds on the Methods 1 and 2 courses and provides skills and knowledge needed to understand and apply a wider variety of statistical and machine learning methods. The course prepares students for Bayesian computational modelling in the Methods 4 course, and provides techniques for data analysis relevant to exam projects in Social and Cultural Dynamics in Cognition, and in the Bachelor thesis project.

Course Objectives

In the evaluation of the student's performance, emphasis is placed on the extent to which the student is able to:

Knowledge: - demonstrate understanding of statistical techniques relying on the Generalised Linear Model - demonstrate understanding of hierarchical modeling methods - demonstrate understanding of basic machine learning concepts.

Skills: - build and evaluate models of hierarchically structured data - integrate machine learning procedures in data analysis - communicate analysis processes, results and interpretation.

Competences: - independently decide on data analysis methods, given a data set and a research question - justify decision making when pre-processing messy data for data analysis.

Required Readings

Class Schedule

Students must read the following before each session. Important: class readings are subject to change, contingent on mitigating circumstances and the progress we make as a class. Students are encouraged to attend lectures and check the course website for updates.

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{r calendar, echo=F, eval=T, fig.cap="A Calendar for the Class (My  
Class Title, Spring 2021)", warning=F, fig.width=11, fig.height=7}  
# # class_cal # #
```

Week 01, 01/04 - 01/08: Introduction and Refresher

Read *all* associated documents on course website.

- [Taking Good Notes](#)
- [Dos and Dont's of Writing for Students](#)
- [Assorted Tips for Students on Writing Research Papers](#)
- [Exam Grading Policy](#)
- [Fun with Attendance and Grades \(i.e. Students Should Attend Class\)](#)

Week 02, 01/11 - 01/15: The First Topic

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Week 03, 01/18 - 01/22: The Second Topic

Your "Slow Ride" appreciation paper is due in Thursday's class.

Week 04, 01/25 - 01/29: Another Topic

Week 05, 02/01 - 02/05: The Fourth Topic

Week 06, 02/08 - 02/12: Keep

Week 07, 02/15 - 02/19: Going

Week 08, 02/22 - 02/26: Down

Week 09, 03/01 - 03/05: the

Week 10, 03/08 - 03/12: Line

Week 11, 03/15 - 03/19: Until

Week 12, 03/22 - 03/26: You

Week 13, 03/29 - 04/02: Are

Week 14, 04/05 - 04/09: Done

Week 15, 04/12 - 04/16: with

Week 16, 04/19 - 04/23: your

Week 17, 04/26 - 04/30: Syllabus

The syllabus contains:

1. The lesson plan (dates and topics)
2. Information on format and exam
3. The reading list for each lecture and class and link to slides and resources

Lesson Plan

1. Why this course?
 - Slides