

DATA SCIENCE AND MACHINE LEARNING

Fall 2020

Instructors:	Thomas Mitterling, Max Thomasberger, Lukas Schmoigl
Email:	lukas.schmoigl@wifo.ac.at
Mode:	3 hours lecture + 2 hours research seminar
Time:	tbd
Place:	tbd

Course Pages:

- <https://learn.wu.ac.at/>

Office Hours: After class, or by appointment, or post your questions in the forum provided for this purpose on LEARN.

Main References: This is a restricted list of various interesting and useful books that will be touched during the course. You need to consult them occasionally.

- Christopher M. Bishop, *Pattern Recognition and Machine Learning*, Springer, 2006.
- Richard O. Duda, Peter E. Hart, and David G. Stork, *Pattern Classification*, Wiley, 2nd ed., 2000.
- Peter Flach, *Machine Learning: The Art and Science of Algorithms that Make Sense of Data*, Cambridge University Press, 2012.

Objectives: This course is designed for graduate students of economics and offers an introduction into modern techniques in data science.

Prerequisites: Basic understanding of probability, statistics, linear algebra and calculus is assumed. Programming skills are required (e.g. R, Python,...)

Tentative Course Outline:

- Machine Learning 1: Regression and classification trees
- Machine Learning 2: Cross-Validation and model validation techniques
- Machine Learning 3: Document classification
- Data Science 1: Data wrangling
- Data Science 2: Data science toolkit (e.g. APIs, geocoding, fuzzy matching,...)
- Data Science 3: Data visualization

Grading Policy: lecture: Midterm (40%), Final Exam (40%), class participation (20%), research seminar: Homework (50%), Project (50%).

Important Dates:

Midterm	tbd
Final Exam	tbd
Project Deadline	tbd

Class Policy:

- Regular attendance is essential and expected.