

MGT-302

Data driven business analytics

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Cursus	Sem.	Type
Humanities and Social Sciences	BA6	Obl.

Language of teaching	English
Credits	2
Session	Summer
Semester	Spring
Exam	Written
Workload	60h
Weeks	14
Hours	2 weekly
Courses	2 weekly
Number of positions	80

Summary

This course focuses on on methods and algorithms needed to apply machine learning with an emphasis on applications in business analytics.

Content

The following topics will tentatively be covered in the course:

1. Supervised learning

- Linear Regression
- Gradient Descent and Stochastic Gradient Descent
- Multiclass Classification
- K-NN
- Support Vector Machines
- Decision Tree and Random Forest

2. Unsupervised learning

- Regularization and Model Selection
- Cross Validation
- PCA

3. Deep Learning

- Deep Neural Networks
- Back propagation

4. Graphical models

- Bayesian networks
- Inference and structure learning

5. Causal inference in time series

- Granger causality
- Directed information Graphs

6. Machine Learning for Asset Pricing**7. Textual Analysis in Finance**

- Topic Models and The Structure of Economic News

- Predicting Financial Returns

8. Dimension Reduction Techniques for Economic Data Series

Keywords

machine learning, causal inference, time series, asset pricing

Learning Prerequisites

Required courses

A course in basic probability theory

A course in basic linear algebra

Calculus

Familiarity with a programming language or environment such as C, C++, Python, Matlab, etc

Important concepts to start the course

Students should be familiar with basic concepts of probability theory, calculus, linear algebra, and programming.

Learning Outcomes

By the end of the course, the student must be able to:

- Formulate supervised and unsupervised learning problems and apply it to data

Transversal skills

- Assess one's own level of skill acquisition, and plan their on-going learning goals.

Teaching methods

Formal teaching interlaced with practical exercises.

Expected student activities

Attending lectures and working on homework and projects.

Assessment methods

30% Homework

20% Midterm project

50% Final project and/or Exam

Supervision

Office hours	Yes
Assistants	Yes
Forum	No