MW118: Applied Machine Learning				**Study Programme:**	M
Module Type:	**ECTS Credits:**	**Workload:**	**Study semester:**	**Module Duration:**	
Optional	8	240	any	one semester	

Courses (HPW=hours per week):	**Contact hours:**	**Independent study:**	**Planned Group Size:**
Course 1: Applied Machine Learning - Lecture (2 HPW)	30h	90h	30
Course 2: Applied Machine Learning – Computer Class (2 HPW)	30h	90h	30

Intended Learning Outcomes (ILOs):

By the end of the module, students will be able to

- assess and apply machine learning methods;
- see connections to other disciplines like statistics, mathematics, and computer science;
- adapt machine learning methods and procedures to various practical problems;
- independently perform own analyses with relevant software packages (R/Python);
- to assess and reflect the possibilities and limits of the different methods.

The acquired knowledge is applied in computer classes with the help of standard software. This promotes the ability to solve practical problems independently and to reflect critically.

Key competencies:

- academic research and writing
- critical thinking
- analytical skills
- willingness to learn and accomplish
- oral and written expression

Description/Contents:

Course 1: Applied Machine Learning - Lecture

1. Linear Regression
2. Classification
3. Resampling Methods
4. Linear Model Selection and Regularization
5. Nonparametric Regression
6. Tree-Based Methods
7. Neural Networks and Deep Learning
8. Unsupervised Learning

Course 2: Applied Machine Learning – Computer Class

Cf. contents of course 1.

Language:

The language of the lectures is English.
Teaching Methods:
Lectures, group work, self-study.
Module Applicability:
M.Sc. Business Administration; M.Sc. VWL; M.Sc. Economics; M.Sc. Business Chemistry; M.Sc. Financial and Actuarial Mathematics
Pre-requisites/Requirements:
Admission to study Business Administration, VWL, Economics, Business Chemistry or Financial and Actuarial Mathematics for a Master's degree. Basic knowledge of statistics and econometrics from the bachelor's program is recommended.
Examination Types:
Written exam (60 min)
Requirements for Award of Credit Points:
Successful participation in the exam. The exam will be passed if the grade is at least „sufficient" (4,0).
Availability:
The module will be offered generally each winter term.
Assessment:
This course will be graded and is part of the calculation for the overall grade of your master degree. Particular information concerning the calculation of the overall grade can be gathered in the respective examination regulations.
Person Responsible and Main Lecturer:
Prof. Dr. Florian Heiß and teaching/research assistants.
Further Information:
Current information can be found at the website of the person responsible as ILIAS and His-LSF.

Stand: 25.09.2023