BW09: Data Analysis				Study Programme:	B
Module Type:	**ECTS Credits:**	**Workload:**	**Study Semester:**	**Module Duration:**	
Optional	12	360	4. or 6.	one semester	

Courses (HPW=hours per week):	Contact hours:	Independent study:	Planned Group Size:
Course 1: AI for all: Introduction to artificial intelligence	0h	120h	30
Course 2: Software based and applied statistical analysis	60h	180h	30

Intended Learning Outcomes (ILOs):

By the end of the module, students will be able to
- explain basic methods of artificial intelligence and simple application examples
- describe different types of data and possible pitfalls and problems of data in the context of artificial intelligence
- perform simple operations and basic commands in Python
- identify different ethical and legal aspects and challenges of artificial intelligence
- independently use standard statistical software for data preparation, data processing and visualization of different data types;
- distinguish between classical and more modern statistical methods for different questions in economics and interpret their results on the basis of problems.

Key competencies:

- Academic research and writing
- Critical thinking
- Analytical skills
- Willingness to learn and accomplish
- Expressiveness (oral and written)

Description/Contents:

Course 1:
1. Theory: Basic concepts and methods of artificial intelligence (including machine learning, deep learning)
2. Programming: Basic introduction to programming with Python
3. Ethics/law: Ethical and legal aspects/implications of the use of artificial intelligence
4. Data: Dealing with data and different types of data
5. Application: Various application examples from everyday life and research

Course 2:
1. Basics of software
2. Data import
3. Basics of data preparation and processing
4. Advanced data preparation and processing
5. Graphical analysis
6. Unstructured data

7. Performance
8. Big data
9. Basics of statistical data analysis
10. Basic parametric methods
11. Extensions of parametric methods
12. Basic non-parametric methods
13. Extensions of nonparametric methods
14. Unsupervised learning
15. Deep learning

Language:

The language of the module is German.

Teaching Methods:

Lectures, self-study.

Module Applicability:

B.Sc. Business Administration; B.Sc. Economics; B.Sc. Financial and Actuarial Mathematics ; B.Sc. Mathematics

Pre-requisites/Requirements:

Admission to the bachelor's degree program "Business Administration", "Economics", "Mathematics", or "Finance and Actuarial Science". Basic knowledge of the modules "Statistical Methods I and II (BS01 and BS02)" is recommended.

Examination Types:

The examination represents a miscellaneous examination requirement.

Requirements for Award of Credit Points:

Successfully passed partial examinations in course 1 and 2 respectively. A partial examination is passed if the evaluation is at least "sufficient" (4,0).

Availability:

Course 1 each semester, Course 2 each summer semester.

Assessment:

This course will be graded and is part of the calculation for the overall grade of your bachelor degree. The grade of this module is calculated as the semester hours weighted average of the grades of the partial exams for course 1 and 2.

Person Responsible and Main Lecturer:

Prof. Dr. Florian Heiß, Dr. Daniel Brunner, Dr. Katja Theune

Other Information: