

Introduction to Data Science

Module Code: DLBDSIDS

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	BA	n/a	150 h

Semester / Term	Duration	Regularly offered in	Language of Instruction
see curriculum	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Thomas Zöller (Introduction to Data Science)

Contributing Courses to Module

- Introduction to Data Science (DLBDSIDS01)

Module Exam Type

Module Exam

Study Format: Distance Learning
Oral Assignment

Split Exam

Weight of Module

see curriculum

Module Contents

- Introduction to data science
- Data
- Data science in business
- Statistics
- Machine learning

Learning Outcomes**Introduction to Data Science**

On successful completion, students will be able to

- define data science and its relation to other fields.
- comprehend data science activities.
- recognize the origins of data and the challenges of working with data.
- understand how data science methods are integrated into business settings.
- grasp fundamental statistical concepts.
- appreciate the importance of machine learning in data science.

Links to other Modules within the Study Program

This module is similar to other modules in the fields of Data Science & Artificial Intelligence

Links to other Study Programs of IUBH

All Bachelor Programmes in the IT & Technology fields

Introduction to Data Science

Course Code: DLBDSIDS01

Study Level	Language of Instruction	Contact Hours	CP	Admission Requirements
BA	English		n/a	none

Course Description

Data science emerged as a multi-disciplinary field aimed at creating value from data. This course starts with an overview of data science and related fields and then defines data types and sources. Special focus is put on the assessment of data quality and electronic data processing. Use of data-driven methods has become vital for businesses, and this course outlines how data-driven approaches can be integrated within a business context and how operational decisions can be made using data-driven methods. Finally, this course highlights the importance of statistics and machine learning in the field of data science and gives an overview of relevant methods and approaches.

Course Outcomes

On successful completion, students will be able to

- define data science and its relation to other fields.
- comprehend data science activities.
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- understand how data science methods are integrated into business settings.
- grasp fundamental statistical concepts.
- appreciate the importance of machine learning in data science.

Contents

1. Introduction to Data Science
 - 1.1 Definition of the term „data science“
 - 1.2 Data science and related fields
 - 1.3 Data science activities
2. Data
 - 2.1 Data types and data sources
 - 2.2 The 5Vs of data
 - 2.3 Data curation and data quality
 - 2.4 Data engineering

3. Data Science in Business
 - 3.1 Identification of use cases
 - 3.2 Performance evaluation
 - 3.3 Data-driven operational decisions
 - 3.4 Cognitive biases
4. Statistics
 - 4.1 Importance of statistics for data science
 - 4.2 Important statistical concepts
5. Machine Learning
 - 5.1 Role of machine learning in data science
 - 5.2 Overview of machine learning approaches

Literature

Compulsory Reading

Further Reading

- Dorard, L. (2014): Bootstrapping machine learning. The first guide to prediction APIs. CreateSpace Independent Publishing Platform, Scotts Valley, CA.
- Downey, A. B. (2013): Think Bayes. O'Reilly, Sebastopol, CA.
- Downey, A. B. (2014): Think stats. 2nd ed., O'Reilly, Sebastopol, CA.
- Kahneman, D. (2012): Thinking, fast and slow. Penguin, London.
- Muller, A. C./Guido, S. (2016): Introduction to machine learning with Python. O'Reilly, Sebastopol, CA.
- Olson, J. (2003): Data quality - The accuracy dimension. Morgan Kaufmann, San Francisco, CA.
- Patil, D. J./Mason, H. (2015): Data driven. O'Reilly Media, Sebastopol, CA.
- VanderPlas, J. (2017): Python data science handbook. O'Reilly, Sebastopol, CA.

Study Format Distance Learning

Study Format Distance Learning	Course Type Online Lecture
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Information about the examination	
Examination Admission Requirements	BOLK: yes Course Evaluation: no
Type of Exam	Oral Assignment

Student Workload					
Self Study 110 h	Presence 0 h	Tutorial 20 h	Self Test 20 h	Practical Experience 0 h	Hours Total 150 h

Instructional Methods	
<input type="checkbox"/> Learning Sprints® <input checked="" type="checkbox"/> Course Book <input type="checkbox"/> Vodcast <input checked="" type="checkbox"/> Shortcast <input checked="" type="checkbox"/> Audio <input type="checkbox"/> Exam Template	<input type="checkbox"/> Review Book <input type="checkbox"/> Creative Lab <input checked="" type="checkbox"/> Guideline <input checked="" type="checkbox"/> Live Tutorium/Course Feed