Programming with Python

Course Code: DLMDSPWP01

Study Level	Language of Instruction	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

Python is one of the most versatile and widely used scripting languages. Its clean and uncluttered syntax as well as its straightforward design greatly contribute to this success and make it an ideal language for programming education. Its application ranges from web development to scientific computing. Especially in the fields of data science and artificial intelligence, it is the most common programming language supported by all major data-handling and analytical frameworks. This course provides a thorough introduction to the language and its main features, as well as insights into the rationale and application of important adjacent concepts such as environments, testing, and version control.

Course Outcomes

On successful completion, students will be able to

- remember basic Python syntax and programming concepts.
- understand object-oriented concepts in Python.
- analyze and apply different methods for error handling in Python.
- know common and important Python libraries and how to apply them to given programming tasks.
- understand concepts like environments and version control.

Contents

1. Introduction to Python
   - 1.1 Data structures
   - 1.2 Functions
   - 1.3 Flow control
   - 1.4 Input / Output
   - 1.5 Modules & packages
2. Classes and inheritance
   - 2.1 Scopes and namespaces
   - 2.2 Classes and inheritance
   - 2.3 Iterators and generators

3. Errors and exceptions
   - 3.1 Syntax errors
   - 3.2 Handling and raising exceptions
   - 3.3 User-defined exceptions

4. Important libraries
   - 4.1 Standard Python library
   - 4.2 Scientific calculations
   - 4.3 Speeding up Python
   - 4.4 Visualization
   - 4.5 Accessing databases

5. Working with Python
   - 5.1 Virtual environments
   - 5.2 Managing packages
   - 5.3 Unit and integration testing
   - 5.4 Documenting code

6. Version control
   - 6.1 Introduction to version control
   - 6.2 Version control with GIT

Literature

Compulsory Reading

Further Reading

- Lutz, M. (2017). Learning python (5th ed.). O'Reilly.
- Mathes, E. (2019). Python crash course. (2nd ed.). No Starch Press.

Study Format Distance Learning

Study Format	**Course Type**
Distance Learning	Online Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Written Assignment

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

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☑ Shortcast	☑ Live Tutorium/Course Feed
☑ Audio	
☐ Exam Template	

Study Format myStudies

Study Format	Course Type
myStudies	Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Written Assessment: Written Assignment

Student Workload					
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