

## Programming with Python

Module Code: DLMDSPWP

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

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

### Module Coordinator

Dr. Cosmina Croitoru (Programming with Python)

### Contributing Courses to Module

- Programming with Python (DLMDSPWP01)

### Module Exam Type

#### Module Exam

Study Format: myStudies

Written Assessment: Written Assignment

Study Format: Distance Learning

Written Assessment: Written Assignment

#### Split Exam

### Weight of Module

see curriculum

### Module Contents

- Introduction to the Python programming language
- Object-oriented concepts in Python
- Handling of exceptions and errors
- The Python library ecosystem
- Environments and package management
- Documentation and testing
- Version control

**Learning Outcomes****Programming with Python**

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.

**Links to other Modules within the Study Program**

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

**Links to other Study Programs of the University**

All Master Programmes in the IT & Technology field.

# Programming with Python

Course Code: DLMDSPWP01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		n/a	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 myStudies**

<b>Study Format</b> myStudies	<b>Course Type</b> Lecture
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<b>Information about the examination</b>	
<b>Examination Admission Requirements</b>	<b>BOLK:</b> yes
<b>Type of Exam</b>	Written Assessment: Written Assignment

<b>Student Workload</b>					
<b>Self Study</b>	<b>Contact Hours</b>	<b>Tutorial</b>	<b>Self Test</b>	<b>Independent Study</b>	<b>Hours Total</b>
110 h	0 h	20 h	20 h	0 h	150 h

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

**Study Format Distance Learning**

<b>Study Format</b> Distance Learning	<b>Course Type</b> Online Lecture
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<b>Information about the examination</b>	
<b>Examination Admission Requirements</b>	<b>BOLK:</b> no
<b>Type of Exam</b>	Written Assessment: Written Assignment

<b>Student Workload</b>					
<b>Self Study</b>	<b>Contact Hours</b>	<b>Tutorial</b>	<b>Self Test</b>	<b>Independent Study</b>	<b>Hours Total</b>
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