



Syllabus: Introduction to Data Science with Python TU Berlin Summer University 2020 Term 3

Week 1 July 20th - 24th

	20	21	22	23	24
	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 - 10:30	Welcome Day! Orientation and 1st session (2h)	Introduction to Python I	Advanced Python I	Introduction to Numpy I	No class
11:00 - 12:30		Introduction to Python II	Advanced Python II	Introduction to Numpy II	Cultural Program
13:30 - 15:30		Introduction to Python III	Cultural Program	Introduction to Numpy III	
16:00 +					

Week 2 July 27th- 31st

	27	28	29	30	21
	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 - 10:30	Introduction to Data Visualization with Matplotlib I	Introduction to Pandas I	Review and Project Introduction I	Machine learning Pipeline I	No class
11:00 - 12:30	Introduction to Data Visualization with Matplotlib II	Introduction to Pandas II	Review and Project Introduction II	Machine learning Pipeline II	Cultural Program
13:30 - 15:30	Introduction to Data Visualization with Matplotlib III	Introduction to Pandas III	Cultural Program	Machine learning Pipeline III	
16:00 +	Cultural Program				

Week 3 August 3rd - 7th

	03	04	05	06	07
	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 - 10:30	Supervised Learning: Regression I	Supervised Learning: Classification I	Unsupervised Learning I	Advanced ML I	No class
11:00 - 12:30	Supervised Learning: Regression II	Supervised Learning: Classification II	Unsupervised Learning II	Advanced ML II	
13:30 - 15:30	Supervised Learning: Regression III	Supervised Learning: Classification III	Cultural Program	Project	
16:00 +	Cultural Program				

Week 4 August 10th - 14th

	10	11	12	13	14
	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 - 10:30	Advanced ML	Project	Project Presentations	Exam	No class
11:00 - 12:30	Project	Project	Project Presentations	Exam	Course review
13:30 - 15:30	Project	Project	Hot Topics in Artificial Intelligence	Open Discussion: AI and Future	Certificates Ceremony
16:00 +	Cultural Program				

Key

Lecture	Field Trip or Practical	Assessment	Cultural Program activity*
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*The cultural program timetable will be emailed to you shortly before your course starts. For more information about the cultural program, and for examples of previous schedules, head here: https://www.tu-berlin.de/menue/summer_university/cultural_program/

Course Organization

The course consists of three components: Lectures, Practical Sessions and Projects. In lectures, the students will learn the foundations of Python programming, Machine Learning, and Deep Learning. After introducing each topic, the students will learn how to apply it in the practical sessions. Last, students will get to solve a real-world problem using machine learning in groups in the Project sessions.

Assessment Information

The final grade will be weighted as follows:

50% Exam

40% Project

10% Participation in Practical Sessions

Grading information

All participants of the TU Berlin Summer & Winter University are required to select their grading option at the time of registration. The two options available are (i) graded or (ii) pass/fail.

All participants who select option (i) graded, will receive a grade under the German grading system. The following table provides an overview of the grading system and equivalent scores for international credit transfers:

Total mark	German grade	English description
More or equal to 95	1,0	Excellent
More or equal to 90	1,3	Very good
More or equal to 85	1,7	Good
More or equal to 80	2,0	Good
More or equal to 75	2,3	Good
More or equal to 70	2,7	Satisfactory
More or equal to 65	3,0	Satisfactory
More or equal to 60	3,3	Satisfactory
More or equal to 55	3,7	Sufficient
More or equal to 50	4,0	Sufficient
Less than 50	5,0	Failed

Credit Points

ECTS is a point system and European standard developed by the Commission of the European Community. ECTS stands for European Credit Transfer System. The aim is to provide common procedures and guarantee academic recognition of studies abroad. The credit system is based on student workload. All lectures, seminars, excursions and homework count towards the workload. One point is awarded for the equivalent of 25-30 hours of workload.

Reading List

Here are reading materials which will be used or referred to during the course. You are not required to read these in advance – this is for your information and reference.

Watching the Google 1 hour Python Class on Youtube before the course is highly recommended. All sources below are available either open source, in the TU Berlin library, or will be provided to you directly by your lecturers, during the course.

To search resources available in the TU Berlin library, check here: <https://www.ub.tuberlin.de/en/searching-for-resources/>

1. Google Python Class on Youtube (<https://youtu.be/tKTZoB2Vjuk>)
2. Müller, Andreas C., and Sarah Guido. Introduction to machine learning with Python: a guide for data scientists. "O'Reilly Media, Inc.", 2016.
3. Raschka, Sebastian, and Vahid Mirjalili. Python machine learning. Packt Publishing Ltd, 2017.
4. Grus, Joel. Data science from scratch: first principles with python. "O'Reilly Media, Inc.", 2015.
5. Bishop, Christopher M. Pattern recognition and machine learning. Springer, 2006.
6. Goodfellow, Ian, Yoshua Bengio, and Aaron Courville. Deep learning. MIT press, 2016.