

Syllabus: Machine learning with python

TU Berlin Summer University 2019 Term 4

Week 1 August 19th-23rd

	19	20	21	22	23
	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 - 10:30	Welcome Day! Room H 0112, ground floor, TUB main building 10:30: Orientation session 12:30-13:15: Buffet lunch 13:30-15:30: Introduction and History of Machine learning 15:30-16:15: Campus Tour 16:15-16:45: Coffee & Cake	2. Basic Concepts of Machine learning	Field trip to computing center	4. CNN	5. RNN
11:00 - 12:30		3. MLP	Field trip to computing center	Exercise	Exercise
13:30 - 15:30		Python Programming	Cultural Program	Python Programming	Python Programming
16:00 +					Cultural Program

Week 2 August 26th-30th

	26	27	28	29	30
	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 - 10:30	Homework Review	7. Reinforcement Learning	Field trip to museum	Game AI Results	8. Advanced Neural Networks
11:00 - 12:30	6. Unsupervised Learning	Game AI Development	Field trip to museum	Exam	9. Applications and Controversy
13:30 - 15:30	Python Programming	Game AI Development	Cultural Program	Exam Review	Ethical Discussion
16:00 +	Cultural Program	16:00-17:00: Programming & Recap Session			Certificates Ceremony Room H3005, 3 rd floor, TU Berlin main building

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/

Assessment information

- Each student has to participate in the exercises and python programming tasks.
- There will be a graded homework due on July 26th. This homework will be responsible for 30% of the final grade.
- The final exam on July 29th will be a written exam. The exam will be responsible for 70% of the final grade.
- Each student will get a grade based on the score of the homework and the final exam. You have to achieve 50% of the total score to pass this course.

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.

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.tu-berlin.de/en/searching-for-resources/>

1. Sebastian Raschka and Vahid Mirjalili (2017): *Python machine learning : machine learning and deep learning with Python, scikit-learn, and TensorFlow*.
2. Aurélien Géron (2017): *Hands-on machine learning with Scikit-Learn and TensorFlow : concepts, tools, and techniques to build intelligent systems*
3. Keras: The Python Deep Learning library (<https://keras.io/>)
4. Ian Goodfellow ; Yoshua Bengio and Aaron Courville (2016): *Deep learning*.