



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Machine Learning for the Internet of Things [S2Inf1-IP>UMIP]

### Course

Field of study

Computing

Year/Semester

1/2

Area of study (specialization)

Internet of Things

Profile of study

general academic

Level of study

second-cycle

Course offered in

polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

30

Laboratory classes

30

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

5,00

### Coordinators

dr inż. Tomasz Łukaszewski

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### Lecturers

### Prerequisites

A student starting this course should have basic knowledge of Python programming and data analysis using machine learning techniques. He should also have the ability to obtain information from the indicated sources and be ready to handle cooperation within the team.

### Course objective

Provide students with knowledge and skills in the field machine learning

### Course-related learning outcomes

Knowledge:

1. has knowledge of machine learning with the use of complex models (e.g. sequential classification, bayesian classifiers, neural networks, including deep networks)
2. has knowledge of development trends and new achievements in machine learning
3. knows advanced methods, techniques and tools used in solving complex engineering tasks in the field of computer science related to machine learning
3. is able to assess the usefulness and applicability of new developments (methods and tools) and new it products from the area of internet of things and machine learning.

4. can assess the usefulness of machine learning methods and tools in the internet of things.
5. is able to solve complex it tasks in the area of internet of things, including tasks with a research component.
6. is able - according to a given specification, taking into account non-technical aspects - to design an information system from the area of internet of things using appropriate methods, techniques and tools of machine learning.

#### Skills:

1. is able to plan and conduct experiments in the area of machine learning, interpret the obtained results and draw conclusions.
2. is able - when formulating and solving engineering tasks in the area of internet of things - to integrate

#### Social competences:

1. understands that knowledge and skills become obsolete very quickly in computing.
2. understands the importance of using the latest knowledge of machine learning in solving problems in the field of internet of things.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired in the lecture will be tested in a credit test. Pass mark: 50% of the mark. Optionally, the mark can be increased by an oral examination. A list of topics will be given to students in advance.

Skills acquired during laboratory classes are verified on the basis of on the basis of the realisation of a project connected with machine learning issues.

### Programme content

The machine learning lecture schedule includes: SVM, sequential classification, Bayesian classification, neural networks and deep learning, regression.

The laboratory programme includes a deepening of the topics discussed in the lectures. In the area of machine learning, libraries for the Python language are used to enable the effective implementation of the solutions discussed. A summary of the acquired knowledge of machine learning within the project.

### Teaching methods

Lecture: multimedia presentation

Laboratory exercises: practical exercises, discussion, team work

### Bibliography

Basic

1. Python. Uczenie maszynowe, Wydanie II, Sebastian Raschka, Vahid Mirjalili, Helion 2019
2. Uczenie maszynowe z użyciem Scikit-Learn i TensorFlow, Wydanie II, Aurelien Geron, Helion 2020

Additional

1. Naczelny Algorytm. Jak jego odkrycie zmieni nasz świat, Pedro Domingos, Helion 2016

### Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	60	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	65	2,50