



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Problem classes I: data analysis [S1SI1E>PRAC1AD]

### Course

Field of study

Artificial Intelligence

Year/Semester

3/5

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

English

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

0

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

30

### Number of credit points

3,00

### Coordinators

dr hab. inż. Dariusz Brzeziński prof. PP  
dariusz.brzezinski@put.poznan.pl

### Lecturers

### Prerequisites

The student should have basic programming skills (Python, R) and basic knowledge of statistics, machine learning, and data mining. The student should also be capable of finding information on his own and be willing to work as part of a team.

### Course objective

Practical team work on machine learning oriented projects. Helping develop practical skills of data mining and machine learning for other people and learning to productize data analysis software. Introduction to scientific presentations and scientific writing.

### Course-related learning outcomes

Knowledge:

1. The student has well-grounded knowledge of fundamental computer science problems within the scope of machine learning, data analysis, and data mining;
2. has basic knowledge of key directions and the most important successes of artificial intelligence understood as an essential sub-domain of computer science, making use of the achievements of other scientific disciplines and providing solutions with a practical impact;

3. has basic knowledge of the machine learning product lifecycle.

#### Skills:

1. The student is capable of formulating and solving complex data analysis problems;
2. can efficiently plan and carry out experiments, including computer measurements and simulations, interpret the obtained results and draw conclusions based on the outcomes of experiments;
3. has necessary preparation for working in a team environment, including cooperation with an external industrial partner;
4. can adapt the existing algorithms as well as formulate and implement the novel algorithms, including the algorithms typical for different streams of AI, by using at least one popular tool;
5. can retrieve, analyze and process different types of data, protect it against undesired access, and convert data analysis results to actionable insights;
6. can adapt existing and make custom machine learning models;
7. can employ information and communication tools at different stages of realizing IT projects, including elaborating a well-documented problem study, giving an oral presentation, and communicating using specialized terms;
8. can plan and organize his/her work when carrying out the engineering tasks as a team member.

#### Social competences:

1. The student knows the impact that data analysis can have on solving practical tasks in companies, and its potential effect on entire societies;
2. can work with others and cooperate in a group, while taking different roles and appropriately defining the priorities for either realizing the self-defined tasks or attaining the targets defined by others;
3. can think and act in an entrepreneurial way, finding commercial applications to the systems being created while also taking into account the social and legal aspects of AI systems.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

On-going project assessment during the semester, mid-term presentation showcasing each group's project, scientific paper draft summarizing the project at the end of the semester.

### Programme content

Team projects on interdisciplinary research topics.

### Course topics

1. Project market: project description, team formation, communicator set-up, initial project kanbans
2. Weekly meetings with each group, backlog analysis, planning
3. Mid-term presentations
4. Course on scientific writing, selecting potential journals/conferences for each project
5. Scientific paper draft for each project

### Teaching methods

Team work, multimedia presentations, case studies, scientific writing

### Bibliography

Basic:

Ng, Andrew. Machine Learning Yearning, 2019.

Additional:

Mathis, Lukas. Designed for use: Create usable interfaces for applications and the web. Pragmatic Bookshelf, 2016.

Tufte, Edward R. The visual display of quantitative information. Vol. 2. Cheshire, CT: Graphics press, 2001.

### Breakdown of average student's workload

|                                                                                                                                            | Hours | ECTS |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------|------|
| Total workload                                                                                                                             | 80    | 3,00 |
| Classes requiring direct contact with the teacher                                                                                          | 30    | 1,00 |
| Student's own work (literature studies, preparation for laboratory classes/<br>tutorials, preparation for tests/exam, project preparation) | 50    | 2,00 |