POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)
pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Research and development project I
Course

Field of study	Year/Semester
Computing	1/2
Area of study (specialization)	Profile of study
Artificial Intelligence	general academic
Level of study	Course offered in
Second-cycle studies	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
Tutorials	Projects/seminars	
	45	

Number of credit points
3

Lecturers

Responsible for the course/lecturer:

Wojciech Kotłowski, Ph.D., D.Sc.

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Responsible for the course/lecturer:

Miłosz Kadziński, Ph.D., D.Sc.

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Prerequisites

Extensive knowledge of the fundamental problems of artificial intelligence and machine learning, and methods of solving them, including advanced methods presented in the courses preceding the project. Ability to use the above methods to solve problems of artificial intelligence of practical importance, in particular to model real problems with the mathematical apparatus acquired during the first semester of the studies. Knowledge of popular tools and libraries containing implementations of artificial intelligence and machine learning algorithms.

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Course objective

The aim of the research and development project is to acquire knowledge and practical skills by the student through a team work (in a team of at least two students, under the supervision of a lecturer) on a real-life application study, using artificial intelligence methods and tools.

Course-related learning outcomes

Knowledge

1.Has advanced and in-depth knowledge of widely understood information systems related to artificial intelligence, theoretical foundations of their construction and methods, tools and programming environments used to implement them [K2st_W1]

2. Has knowledge about development trends and the most important cutting edge achievements in computer science and artificial intelligence [K2st_W4]

3. Knows advanced methods, techniques and tools used to solve complex engineering tasks and conduct research in a artificial intelligence [K2st_W6]

Skills

1. Is able to use information and communication techniques used in the implementation of IT projects [K2st_U2]

2. Can use analytical, simulation and experimental methods to formulate and solve engineering problems and simple research problems [K2st_U4]

3. Can - when formulating and solving engineering tasks - integrate knowledge from different areas of computer science (and if necessary also knowledge from other scientific disciplines) and apply a systemic approach, also taking into account non-technical aspects [K2st_U5]

4. Is able to assess the suitability and the possibility of using new achievements (methods and tools) and new IT products [K2st_U6]

5. Can carry out a critical analysis of existing technical solutions and propose their improvements (streamlines) [K2st_U8]

6. Is able to assess the usefulness of methods and tools for solving an engineering task, consisting in the construction or evaluation of an IT system or its components, including the limitations of these methods and tools; [K2st_U9]

7. Is able - using among others conceptually new methods - to solve complex IT tasks, including atypical tasks and tasks containing a research component [K2st_U10]

8. Is able - in accordance with a given specification, taking into account non-technical aspects - to design a complex device, IT system or process and implement this project - at least in part - using appropriate methods, techniques and tools, including adapting to this purpose existing tools or developing new ones [K2st_U11]

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9. Can communicate both in Polish and English using different techniques in a professional environment and in other environments, also using IT tools [K2st_U12]

10. Is able to prepare and present a scientific study in Polish and English, presenting the results of scientific research or oral presentation on specific issues in the field of computer science [K2st_U13]

11. Is able to interact in a team, taking various roles in it [K2st_U15]

Social competences

1. Understands the importance of using the latest knowledge in the field of computer science in solving research and practical problems [K2st_K2]

2. Understands the importance of popularization activities concerning the latest achievements in the field of artificial intelligence [K2st_K3]

3. Is aware of the need to develop professional achievements and comply with the rules of professional ethics [K2st_K4]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The result of the project must be a fully or a partially completed product (e.g. application, code fragment) that can be used in a company, organization, institution, etc. The document confirming the completion of the research and development project will be a certificate confirming the student's acquisition of competences under AI Tech. Optionally, in a justified case, it is possible to present a report on a research and development project.

The research and development project is continued in the next semester of studies (as Research and development project II), at the end of which the final verification of the learning outcomes takes place. For the evaluation of the first semester of the project, the supervisor and the team of students establish the milestones that must be achieved during this time. At the end of the semester, the tutor verifies their achievement and summarizes the progress of the team of students.

Programme content

The scope and the tasks set for the student as the research and development project depend on the specificity of the problem that the team of students is trying to solve together with the tutor. However, the project must concern problems in which the artificial intelligence methods are used to develop a solution that has the potential to be implemented in practice.

Teaching methods

Individual meetings of students with the supervisor of the research and development project, during which the students present the developed solutions, acquire knowledge through a joint analysis of the literature and research works related to the project, and solve the problems encountered together with the supervisor. Teamwork. Case study.

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Bibliography

Basic

Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	30	1,0

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[1] delete or add other activities as appropriate

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