COURSE DESCRIPTION CARD - SYLLABUS

Course name
Bachelor's capstone project [S1SI1E>PRAC]

Course

Field of study
Artificial Intelligence

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
15

Number of credit points

1,00

Coordinators

dr hab. inż. Marek Wojciechowski prof. PP
marek.wojciechowski@put.poznan.pl

Lecturers

Prerequisites

A student starting this subject should have the basic knowledge, skills and competencies acquired in earlier years of study, enabling him to carry out a team engineering project. In addition, in terms of social competence, the student must present such attitudes as honesty, responsibility, perseverance, cognitive curiosity, creativity, personal culture, respect for other people.

Course objective

The course completes another course, "Diploma thesis preparation", that is realized in the same semester. They jointly form a conceptual whole in the context of realizing the diploma thesis by students. The purpose of the diploma process is to deepen the theoretical knowledge related to the selected topic of the work, to acquire the ability to solve practical engineering problems, including team realization of the work's subject. The main goal is for students to implement a complex information technology project based on the selected project implementation methodology in accordance with the principles of software engineering and to prepare an engineering thesis. The course also aims to prepare students for independent and team project work.

Course-related learning outcomes

Knowledge:
- has a basic knowledge of key directions and the most important successes of artificial intelligence (K1st_W5)

Skills:
- is able to search for useful sources of information (including English-language sources), as well as methods and techniques necessary for the realization of an engineering diploma thesis and use them properly, integrate them, interpret and critically evaluate them and draw conclusions (K1st_U1)
- has basic skills concerning the assessment of the computational complexity of algorithms, programming with popular languages, using operating and database systems as well as a variety of IT systems (K1st_U2)
- can formulate and solve complex problems within the scope of computer science and, in particular, artificial intelligence by applying appropriately selected methods (including analytical, simulation, or experimental approaches) (K1st_U3)
- is able to properly plan and carry out experiments related to the realization of the diploma work, including measurements and computer simulations, interpret the obtained results and correctly draw conclusions from them (K1st_U4)
- is able to critically analyze the functioning of information systems and other AI solutions that are the subject of the diploma thesis and evaluate these solutions (K1st_U7)
- can design - following a pre-defined specification - and create an IT system by first selecting and then using the available methods, techniques, and computer tools (including programming languages) (K1st_U8)
- can adapt the existing algorithms as well as formulate and implement novel algorithms (K1st_U9),
- can retrieve, analyze and transform different types of data, protect it against undesired access, and carry out data synthesis to knowledge and conclusions useful for solving problems related to the diploma thesis (K1st_U10),
- can adapt and make use of the models of intelligent behavior as well as computer tools simulating such a behavior (K1st_U11),
- is able to use information and communication techniques, which are applied at different stages of realization of engineering diploma thesis (K1st_U14),
- can plan and organize work when carrying out engineering tasks individually or as a team member; is able to divide the tasks with the people co-creating the diploma team and appropriately assign roles during the implementation of the diploma project, and is able to appropriately determine priorities for the implementation of the task defined by himself or others (K1st_U15)

Social competences:
- understands that in computer science and artificial intelligence, knowledge and skills become obsolete very quickly (K1st_K1)
- is aware of the importance of knowledge in solving engineering problems (K1st_K2)
- 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 specified by others (K1st_K4)
- can think and act in an enterprising way, finding the commercial application for the created AI-based systems, having in mind the economic benefits as well as legal and social issues (K1st_U5)
- is aware of the social role of a graduate of the university of technology (K1st_K6)
- is ready to act responsibly in professional life, encourage and promote the suitable behavior patterns, correctly identify and solve the dilemmas related to the work of a computer scientist - a specialist in the field of AI (K1st_K7)

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The learning outcomes outlined above are verified as follows:
- continuous evaluation, by means of the students' report on the progress of work related to the implementation of the thesis,
- evaluation of the increment of skills in the use of learned principles and methods,
- evaluation of reports prepared on selected issues implemented as part of the engineering thesis project,
- evaluation of teamwork skills,
- evaluation of project results: does the product meet the requirements? Does the product have a user-

friendly interface?
- evaluation of the quality of documentation and timeliness of completion of individual tasks.
The thesis supervisor issues a general evaluation of the thesis and individual evaluations of team members, justifying any discrepancies between the general evaluation and individual evaluations, as well as between individual evaluations awarded to individual team members. On the basis of both evaluations, the supervisor issues a final individual grade for each team member. The reviewer evaluates the overall project, i.e. assigns an equal (common) grade for each team member.

Programme content

The subject of an engineering thesis is usually the implementation of a project - a task defined by the thesis supervisor or an AI-oriented company or institution cooperating with the university. This task can be the design, implementation and deployment of an IT system based on the indicated technologies or the solution (with implementation and testing) of a research problem.
A well-run project should be based on a well-recognized IT project implementation methodology (e.g. SCRUM), and the progress of implementation made visible with appropriate indicators, models, deliverables. The end result of the project is working prototype or fully functional software, ready for implementation. In addition, the attachment of the project is its technical and user documentation, which is a component of the written engineering thesis.

Course topics

none

Teaching methods

- consultations in the scope of the projects carried out with the supervisor
- workshops - discussions within the team implementing the work

Bibliography

Basic:
depending on the research topic

Additional:
-

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50