

## SYLLABUS

**Name: Artificial Intelligence Methods in Engineering Applications**

**Name in Polish: Metody sztucznej inteligencji w zastosowaniach inżynierskich**

**Name in English: Artificial Intelligence Methods in Engineering Applications**

### Information on course:

<b>Course offered by department:</b>	Faculty of Organisation and Management
<b>Course for department:</b>	Silesian University of Technology
<b>Study level and form:</b>	<del>Master's degree</del> /Bachelor's degree, Full-time
<b>Term:</b>	summer semester 2025/2026
<b>Coordinator of course edition:</b>	Magdalena Palacz, Ph.D., D.Sc.

### Default type of course examination report:

credit

### Language:

English

### Course homepage:

[\[link\]](#)

### ECTS

2

### Short description:

The course objectives include:

1. The organized knowledge of theoretical and practical aspects in the field of artificial intelligence.
2. Fundamental principles necessary to operate with artificial intelligence.
3. Knowledge of the construction and functioning of a simple AI system.

### Description:

1) lectures:

Basic definitions of intelligence, artificial intelligence with examples and potential applications; basic tools used for AI; artificial intelligence history and foundations; AI Agents; Problem-solving characterisation; Machine Learning; Methods for communicating used in AI – neural networks, genetic algorithms; Most spectacular applications of AI; benefits and dangers of AI implementation.

2) project:

In an essay, the student should describe the improvement of AI-based systems in the area of one's hobby with careful attention paid to potential benefits and dangers.

3) laboratory:

Students will be working with a simple robotic system (lego Mindstorm) to program it for a simple production line application.

Number of hours of classes with direct participation of academic teachers or other persons teaching courses and students

Contact hours:

Lecture: 15 h

Project: 15 h

Laboratory: 15 h

Lecture credit: 1 h

Project credit: 1 h

Laboratory credit: 1 h

Student's own work

Preparation for lecture credit: 5h

Project preparation: 7h

Total workload: 60

Number of ECTS credits: 2

including the number of ECTS credits covered by the study programme to be earned as part of the courses taught with the direct participation of academic teachers or other persons teaching courses and students: 1,5

### Bibliography:

Heaton Jeff: Artificial Intelligence for Humans, vol. 1 – Fundamental Algorithms

Russell Stuart and Norvig Peter: Artificial Intelligence – a Modern Approach

Carter Matt: Minds and Computers – An Introduction to the Philosophy of Artificial Intelligence

Heaton Jeff: Introduction to the Math of Neural Networks

### Learning outcomes:

**KNOWLEDGE: the student knows and understands**

K1A\_W20 the fundamental dilemmas of modern civilisation

**SKILLS: the student is able to**

K1A\_U01 use rules of precise, logical thinking in the analysis of physical and technical processes

K1A\_U13 use analytical, simulation and experimental methods in the identification and formulation of specifications of engineering tasks and their solution:

- use analytical, simulation and experimental methods,

<ul style="list-style-type: none"> <li>- recognize their system and non-technical aspects, including ethical aspects</li> <li>- make a preliminary economic assessment of the proposed solutions and engineering actions taken</li> </ul> <p><u>SOCIAL COMPETENCE: the student is ready for</u></p> <p>K1A_K01 critically evaluate his/her acquired knowledge and the received content</p> <p>K1A_K02 recognise the importance of knowledge in solving cognitive and practical problems and consults experts when having difficulty solving problems independently</p>
<b>Assessment methods and assessment criteria:</b>
<p>Lecture: Written test with multiple choice questions. Passing criteria: minimum 50% of correct answers.</p> <p>Project: Documented project work. Passing criteria: providing and presenting the project work in accordance with the specified requirements of the project task.</p> <p>Laboratory: written reports being the description of the prepared model of a production line.</p>
<b>Practical placement:</b>
Not applicable