



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Introduction to artificial intelligence [N1AiR2>WdSI]

### Course

Field of study

Automatic Control and Robotics

Year/Semester

4/7

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

### Number of hours

Lecture

10

Laboratory classes

20

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

prof. dr hab. inż. Piotr Skrzypczyński  
piotr.skrzypczynski@put.poznan.pl

### Lecturers

### Prerequisites

Student starting this course should have knowledge of the basics of programming, architecture of computer systems and operating systems, linear algebra. He should also have the ability to obtain information from the indicated sources.

### Course objective

The module aims to provide to the students basic concepts, methods and algorithms regarding the foundations of artificial intelligence and its selected areas related to robotics.

### Course-related learning outcomes

Knowledge:

1. Has knowledge of the basic concepts and methods of artificial intelligence
2. Knows what methods and algorithms of artificial intelligence are used in robotics.
3. Has knowledge of selected methods of representing problems and algorithms for solving them.

Skills:

1. Can choose effective methods of artificial intelligence to solve problems in the field of robotics.

2. Can implement and use basic artificial intelligence algorithms.

Social competences:

1. Competent in presenting AI-based solutions in an interdisciplinary team.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written exam (checking theoretical knowledge) in the field of lectures: concepts, methods, algorithms.

Laboratories: checking practical skills in the field of implementation of selected methods introduced during the lecture, evaluation of reports.

### Programme content

Lecture

1. Introduction
2. Types and architectures of AI systems
3. Representation and processing of symbolic information.
4. The concept of state space and search algorithms.
5. Probabilistic methods in AI and Bayesian networks.
6. Introduction to supervised and unsupervised machine learning.
7. Statistical learning systems.
8. Final remarks .

Laboratory (each topic includes from 2 to 3 classes)

1. Searching the space of states
2. Heuristic search algorithms and planning.
3. Application of the Bayes rule and Bayesian networks.
4. Selected methods of statistical learning
5. Selected classifiers.

### Course topics

none

### Teaching methods

1. Lecture: multimedia presentation, illustrated with examples
2. Laboratory exercises: carrying out the tasks given by the teacher - practical exercises

### Bibliography

Basic:

1. Flasiński M., Wstęp do sztucznej inteligencji, PWN, 2011.
2. Rutkowski L., Metody i techniki sztucznej inteligencji. PWN, 2009
3. Krawiec K., Stefanowski J., Uczenie maszynowe i sieci neuronowe. Wyd. Politechniki Poznańskiej, 2004.

Additional:

1. Nilsson N. J., Artificial Intelligence: A New Synthesis, Morgan Kaufmann, 1998

### Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	45	2,00