



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Foundation of artificial intelligence [S1AiR1E>PO4-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

English

Form of study

full-time

Requirements

elective

Number of hours

Lecture

45

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

30

Number of credit points

5,00

Coordinators

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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:

Has a basic knowledge of the theory and basic methods of artificial intelligence and decision systems [K1_W7 (P6S_WG)].

Is familiar with the current status and latest development trends of the field of automation and robotics [K1_W21 (P6S_WG)].

Knows and understands the fundamental dilemmas of modern civilisation related to the development of automation and robotics [K1_W28 (P6S_WK)].

Skills:

Can design and practically use simple diagnostic and decision-making systems dedicated to automation and robotics systems [K1_U21 (P6S_UW)].

Is able to develop a solution to a simple engineering task and implement, test and run it in a selected programming environment on a PC for selected operating systems [K1_U26 (P6S_UW)].

Social competences:

Is ready to critically assess his/her knowledge; understands the need for and knows the possibilities of continuous training - improving professional, personal and social competence, is able to inspire and organize the learning process of others [K1_K1 (P6S_KK)].

The graduate is ready to fulfil social obligations and co-organise activities for the benefit of the social environment; is aware of the social role of a graduate of a technical university and understands the need to formulate and convey to the public (in particular through the mass media) information and opinions on the achievements of automation and robotics and other aspects of engineering activities; the graduate makes efforts to communicate such information and opinions in a generally understood manner [K1_K7 (P6S_KO)].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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	150	5,00
Classes requiring direct contact with the teacher	75	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	75	2,50