Faculty of Mathematics and Computer Science

Course title: Artificial Intelligence

ECTS credit allocation (and other scores): 5

Semester: spring

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: General computer science, IT systems engineering

Language: English/Polish

Number of hours per semester: 30 lectures + 30 classes = 60 hours

Course coordinator/ Department and e-mail: Erasmus coordinator Anna Szczepkowska/ WMiI, erasmuswmii.uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: Solving problems using knowledge from lectures and writing programs to check the implementation of some problems in practice. Writing program to preprocess data. Writing program applying serach strategies to find a solution for a goal-based agent. Solving small problems applying artificial neural network techniques.

LECTURES: Introduction to artificial intelligence and machine learning. Fundamentals of supervised learning. Modeling an intelligent agent. Search agent: Search algorithms - Heuristic search algorithms.Problem-solving agent: Constraint-satisfying algorithms. Knowledge representation and decision systems. Rough sets. Fuzzy sets. Knowledge-based agent: Propositional logic. Basics of reasoning in first-order logic. Learning from examples: Introduction to regression and classification. Learning error. Neural networks. Decision trees. Entropy and information gain. Cross-validation. Inference based on probability. Naive Bayes model.

Learning purpose:

Making students aware how the term Artificial Intelligence is distributed over different fields of studies and how aggregating different such aspects of computer science along with some knowledge representation and machine learning techniques an automated decision support systems can be designed.

On completion of the study programme the graduate will gain:

Knowledge:

Student will have knowledge about different aspects of AI, starting from methods of data processeing, methods of knowledge representation, methods of classification, methods of performance measures to designing learning algorithms for a given tasks.

Skills:

Student will be abe to design a given task environment for an artificial agent, represent knowledge about the environment of the agent, use appropriately selected methods to construct a classification model for a given knowledge base and assess its effectiveness.

Social Competencies:

The student will understand how knowledge can be connected for solving real life problems and understands the need for continuous learning in order to better understand and apply the theories in practice.

Basic literature:

1. Stuart Russell, Peter Norvig, Artificial Intelligence A Modern Approach, Prentice Hall, R. 2010.

2. Hui Jiang, Machine Learning Fundamentals: A Concise Introduction, Cambridge University Press, 2022.

Supplementary literature:

1. Tom M. Mitchell, Machine Learning, McGraw-Hill Science/Engineering/Math; 1997.

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 2.75 ECTS points

Student's independent work: 2.25 ECTS points