Course Syllabus

I. General Information

Course name	Artificial intelligence
Programme	Mathematics
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	BA
Form of studies (full-time, part-time)	full-time
Discipline	Mathematics
Language of instruction	język angielski

Course coordinator/person responsible	Dr hab. Ryszard Kozera

Type of class *(use only the types mentioned below)*	Number of teaching hours	Semester	ECTS Points
lecture	30	IV or VI	5
tutorial			
classes			
laboratory classes	30	IV or VI	
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course pre-requisites	1. Logic. Propositional logic. Predicate logic. 2. Linear algebra and analytic geometry. 3. Discrete mathematics. 4. Introduction to computer science.

II. Course Objectives

1. Familiarize students with the basics of proving the truth of sentences and formulas, truth table, application of inferences and refutation in the area of artificial intelligence
2. Familiarize students with declarative programming in a selected programming language
3. Familiarize students with automation of theorem proving.
4. Exercises with documentation
5. Application of artificial intelligence methods

III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
KNOWLEDGE		
W_01	The student understands the meaning of computer science in the area of artificial intelligence	K_W01
W_02	The student has a basic knowledge in the area of artificial intelligence	K_W04
SKILLS		
U_01	Can use his knowledge to correctly and understandably formulate complex and non-trivial mathematical problems, discuss them and ways of solving them, and present mathematical results and content, in particular with the use of information and communication techniques	K_U38
SOCIAL COMPETENCIES		
K_01	The student is aware of the role and importance of knowledge in solving problems of artificial intelligence of a cognitive and practical nature, typical for professions and jobs appropriate for graduates of mathematics studies, and to consult experts in the event of difficulties with solving the problem on their own	K_K02
K_02	The student is ready to present and explain to laymen selected achievements of higher mathematics in the field of artificial intelligence	K_K05

IV. Course Content

1 Introduction to Artificial Intelligence.
2 Classical calculus in the AI.
3 Predicate calculus on the AI.
4 The unification algorithm.
5 Programming in Prolog. Lists.
6 The Herbrand theory .
7 Searching and SLD trees.

V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods *(choose from the list)*	Forms of assessment *(choose from the list)*	Documentation type *(choose from the list)*
KNOWLEDGE			
W_01	- conventional lecture, - individual work with computer, - teaching methods	- written exam, - test, - project, - preparation for classes	- written work, - folder of files, - report

	supported by information techniques, - discussion, - problem method, - academic classes in laboratory equipped with projector,		
W_02	- conventional lecture, - individual work with computer, - teaching methods supported by information techniques, - discussion, - problem method, - academic classes in laboratory equipped with projector,	- written exam, - test, - project, - preparation for classes	- written work, - folder of files, - report
	SKILLS		
U_01	- individual work with computer, - teaching methods supported by information techniques, - problem method, - academic classes in laboratory equipped with projector,	- written exam, - test, - project, - preparation for classes	- written work, - folder of files, - report
	SOCIAL COMPETENCIES		
K_01	- conventional lecture, - teaching methods supported by information techniques, - discussion, - problem method, - academic classes in laboratory equipped with projector,	- work and activity during laboratories and lectures	register of bonus points
K_02	- conventional lecture, - individual work with computer, - teaching methods supported by information techniques, - discussion, - problem method, - academic classes in laboratory equipped with projector,	- work and activity during laboratories and lectures	register of bonus points

VI. Grading criteria, weighting factors.....

LABORATORY:
Passing the classes: tests (50% of final evaluation) and group project to complete (50% of final evaluation).
Grading scale: below 50% fail (2.0).
Detailed assessment rules are given to students with each subject edition.
LECTURE:
Written exam (for students which pass classes).
Grading scale: 50%-57% sufficient (3.0), 58%-64% satisfactory (3.5), 65%-72% good (4.0), 73%-80% very good (4.5), above 80% excellent (5.0), below 50% fail (2.0)

VII. Student workload

Form of activity	Number of hours
Number of contact hours (with the teacher)	Lecture 30, Classes 30, Consultations 30,
Number of hours of individual student work	Preparation for classes 30, Studying literature 20, Preparation for the test and exam 25,

VIII. Literature

Basic literature
1. R. Kozera, "Artificial Intelligence and Logic Programming" - lecture 2. G. Royle, "Logic programming", 1999 3. M. Ben-Ari, „Mathematical Logic for Informatics”, 2006
Additional literature
1. J. Wielemaker, "SWI Prolog 2.7 Reference Manual", Updated for version 2.7.14, September 1996, University of Amsterdam, Dept. of Social Science Informatics 2. SWI Prolog Documentation, link: swi-prolog.org (16.12.2017) 3. James Lu, Jeru d J. Mead, „Prolog. A Tutorial Introduction”, Computer Science Department Bucknell University, Lewisburg, PA 17387. 4. Leon S. Sterling, Ehud Y. Shapiro, „The Art of Prolog, Second Edition. Advanced Programming Techniques”, MIT Press, 1994 5. William F.Clocksin, Christopher S. Mellish, „Programming in Prolog. Using ISO Standard. Fifth Edition”, Springer-Verlag Berlin Heidelberg 2003