COURSE SYLLABUS AND COURSE REQUIREMENTS
ACADEMIC YEAR 2022/2023 SEMESTER 1

Course title	*Artificial intelligence*
Course Code	IVM435ANMI
Hours/Week: le/pr/lab	2 / 0 / 0
Credits	3
Degree Programme	Computer Science Engineer MSc
Study Mode	*full-time, correspondence*
Requirements	exam
Teaching Period	2022-23/1
Prerequisites	-
Department(s)	Systems and Software Technologies
Course Director	Tamas STORCZ
Teaching Staff	Tamas STORCZ, dr. Zsolt ERCSEY

COURSE DESCRIPTION

A short description of the course (max. 10 sentences).
Neptun: Instruction/Subjects/Subject Details/Basic data/Subject description

Artificial intelligence (AI) is an important research field that focuses on the modelling of intelligent human behaviour on a machine. The aim is to design and make a computer that can learn, reason, and solve problems autonomously, ie in such a way that the actions result reflects the result of the activities of human thinking. Even though artificial intelligence has been studied for quite a long time now, it is still a challenge to make a computer that is as intelligent as a human. There are some very specific fields where there are some success already, for example the Deep Blue system defeated the world chess champion, yet in other cases as well as in general, there are a lot of work in front of us.

After the course, students will

- know the main areas of AI,
- have a glance into the current trends of AI,
- know the results achieved of AI,
- be able to typify AI problems,
- know what sort of techniques to use to solve specific AI problems

SYLLABUS

Neptun: Instruction/Subjects/Subject Details/Syllabus

1. GOALS AND OBJECTIVES

Goals, student learning outcome.
Neptun: Instruction/Subjects/Subject Details/Syllabus/Goal of Instruction

Artificial intelligence include and involve a lot of fields such as problem representation, knowledge representation, combinatorial search, problem solving, expert systems, reasoning, planning, natural language understanding, computer vision, machine learning, genetic programming, neural nets, robotics and so on. Obviously, these field have a continuous affect on AI back and forth and also on each other; problem solving itself should involve learning and its methods are useful for reasoning; while computer vision can be solved using methods developed in the field of pattern recognition.

In this course, the students will get familiar with the most fundamental knowledge for understanding artificial intelligence. Some basic search algorithms for problem solving will be introduced together with knowledge representation, reasoning and neural nets.

2. COURSE CONTENT

Neptun: Instruction/Subjects/Subject Details/Syllabus/Subject content

	TOPICS
LECTURE	1. *History, theoretical background, general concepts* 2. *State space representation, Search algorithms, Party problem* 3. *Graph theory* 4. *Games* 5. *Genetic algorithm* 6. *Agents* 7. *Neural Nets* 8. *Knowledge representation* 9. *Semantic networks* 10. *Bayes Model* 11. *Fuzzy sets and models*
PRACTICE	-
LABORATORY PRACTICE	-

DETAILED SYLLABUS AND COURSE SCHEDULE

ACADEMIC HOLIDAYS INCLUDED

LECTURE

week	**Topic**	**Compulsory reading; page number (from … to …)**	**Required tasks (assignments, tests, etc.)**	**Completion date, due date**
1.		…	…	…
2.	Theoretical background. Introduction. General concept and definitions of artificial intelligence. History. State space representations. Search algorithms	[1]: 7-107	Project work announcement	week 9
3.				
4.	Graph theory. Party problems. Problem reduction. Decomposition.	[1]: 108-152		
5.				
6.	Hypergraphs. Games. Partial evaluation algorithms	[1]:152-180		
7.				
8.	Genetic algorithms, Agents, Neural nets	[1]: 180-205		
9.				Project work
10.	Knowledge representation. Semantic networks. Bayes Model. Fuzzy sets and models. Event cases	[1]: 206-227		
11.				Project retake
12.	Test			
13.				
14.	Test retake			
15.				

PRACTICE, LABORATORY PRACTICE

week	**Topic**	**Compulsory reading; page number (from … to …)**	**Required tasks (assignments, tests, etc.)**	**Completion date, due date**
1.				
2.				
3.				
4.				

5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

3. ASSESSMENT AND EVALUATION

(Neptun: Instruction/Subjects/Subject Details/Syllabus/Examination and Evaluation System)

ATTENDANCE

In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description.

Method for monitoring attendance *(e.g.: attendance sheet / online test/ register, etc.)*

-

ASSESSMENT

Cells of the appropriate type of requirement is to be filled out (course-units resulting in mid-term grade or examination). Cells of the other type can be deleted.

Course-unit with final examination

Mid-term assessments, performance evaluation and their weighting as a pre-requisite for taking the final exam

(The samples in the table to be deleted.)

Type	Assessment	*Weighting as a proportion of the pre-requisite for taking the exam*
1. *Solution of project work*	*100 points*	*50%*
2. *Test*	*100 points*	*50%*

Requirements for the end-of-semester signature

(Eg.: mid-term assessment of 40%)

Accepted solution for project work (functional completeness)
Complete the test with minimum 40%

Re-takes for the end-of-semester signature (PTE TVSz 50§(2))

The specific regulations for grade betterment and re-take must be read and applied according to the general Code of Studies and Examinations. E.g.: all the tests and the records to be submitted can be repeated/improved each at least once every semester, and the tests and home assignments can be repeated/improved at least once in the first two weeks of the examination period.

Project work solution resubmission until week 11.
Test retake on week 14.

Type of examination *(written, oral):* *…written…….*

The exam is successful if the result is minimum 40 %. *(The minimum cannot exceed 40%.)*

Calculation of the grade *(TVSz 47§ (3))*

The mid-term performance accounts for ***0*** %, the performance at the exam accounts for ***100*** % in the calculation of the final grade.

Calculation of the final grade based on aggregate performance in percentage.

Course grade	Performance in %
excellent (5)	85 % …
good (4)	70 % ... 85 %
satisfactory (3)	55 % ... 70 %
pass (2)	40 % ... 55 %
fail (1)	below 40 %

The lower limit given at each grade belongs to that grade.

4. SPECIFIED LITERATURE

In order of relevance. (In Neptun ES: Instruction/Subject/Subject details/Syllabus/Literature)

COMPULSORY READING AND AVAILABILITY

[1] *Ercsey, Zs., Achs, Á.,: ARTIFICIAL INTELLIGENCE. ISBN 978-963-429-195-4.*

RECOMMENDED LITERATURE AND AVAILABILITY

[2] Alison Cawsey: The Essence of Artificial Intelligence. Prentice Hall. 1998. ISBN-13: 978-0135717790
[3] Stuart Russell, Peter Norvig: Artificial Intelligence. A Modern Approach. Prentice Hall. 2003. ISBN 0137903952
[4] Alison Cawsey: Mesterséges intelligencia, alapismeretek. Panem. 2002. ISBN 963 545 285 3
[5] Stuart Russell, Peter Norvig: Mesterséges intelligencia modern megközelítésben. Panem. 2005. ISBN 963 545 411 2.)
[6] Mesterséges intelligencia. Szerkesztette: Futó Iván. Aula Kiadó. 1999. ISBN 963 9078 99 9.