Artificial Intelligence 2
Course Code: IVM436AN
Semester: Spring 2018/2019 2.

Course Syllabus
Schedule: Friday, 11:15-12:45, every week
Location: PTE MIK, A-118

General Information:

Name of Course:	# ARTIFICIAL INTELLIGENCE 2
Course Code:	IVM436AN
Semester:	2nd
Number of Credits:	4
Allotment of Hours per Week:	2 Lectures + 1 lab /Week
Evaluation:	Exam
Prerequisites:	**Artificial Intelligence 1**
Instructors:	**Dr Zsolt ERCSEY, Assistant Professor**
	Office: 7624 Hungary, Pécs, Boszorkány u. 2. Office Nº B-144
	E-mail: ercsey@mik.pte.hu
	Office Phone: +36 72 503 650

Introduction, Learning Outcomes:

The course is intend for master students in the Master of Engineering Information Technologist Program.

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.

General Course Description and Main Content:

Artificial intelligence include and involve a lot of fields as discussed during the course Artificial Intelligence 1, as prerequisite. During this course, the students will get familiar with some current trends and results of artificial intelligence. Moreover, students will individually review particular topics.

Previously introduced fields will be specially investigated, namely representation problems, neural nets, evolutionary algorithms, fuzzy models, machine learning and cloud will be considered. Examples taken from chemical engineering, architecture, traffic, agricultural and other industrial fields will be considered to illustrate selected solutions methods based on different representation techniques, where optimality plays a key role. Problems are deeply investigated together with potential heuristics to overcome the difficulties as well as search space reduction algorithms are presented. Static and dynamically evolving, for example evacuation planning, examples will also be considered.

Within a framework with IBM students will use Watson computer system.

Faculty of Engineering and Information Technology University of Pécs, H-7624 Pécs, Boszorkány u. 2., HUNGARY
Phone: +36 72 503 650
e-mail: informatics@mik.pte.hu

The course will cover the following topics

1. Process network synthesis and optimization.
2. Fuzzy critical path.
3. Multi period production and optimization.
4. Neural nets.
5. Feature representation and detection.
6. IBM Watson.
7. Chemical engineering problems.
8. Project management problems.
9. Software tools.
10. Urban traffic problems.
11. Agricultural problems.
12. Architect problems.
13. Selected topics.

The Course includes:
- Regular (weekly) lectures.
- Continuously communication and discussion between the Lecturer and the Students. Common evaluation.
- 2 presentations by the Students based on the instructions of the Lecturer.
- Exam in two stages (both written and oral part).

Methodology:

The course is based on continuous discussions; examine of case studies, actual topics, conventional and non-conventional situations. The students' verbal feedback is required.

Methods:
- Lectures about the fields of artificial intelligence.
- Discussion of event cases, situations.
- Short and extended oral presentations by the Students at a fixed time during the semester.
- Working with special software tools.

Presentations by students:
- All Students have to present one selected topic.
- Topics are preliminary discussed. Topics are of general interests in major fields of AI.
- Presentations can only be completed during the Study Period.
- Short written part has to be sent before and accepted.
- In case the presentation is not accepted or missed it does not count, i.e. the exam period cannot be entered, ie it is grounds for failing the course.

Faculty of Engineering and Information Technology University of Pécs, H-7624 Pécs, Boszorkány u. 2., HUNGARY
Phone: +36 72 503 650
e-mail: informatics@mik.pte.hu

Schedule:

The rough outline of the schedule is as follows.

Schedule

2018/2019. SPRING		Study period															Exam period				
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	1.	2.	3.	4.	5.
Topic			1	2	Expo	3	Szünet	4	13	6.	Szünet	Szünet	13	13							
Topic			7	8	Expo	9, 10	Szünet	5, 11	13	6.	Szünet	Szünet	13	13							
Test																					
Retake, pre-exam																					
Home Work	Selection																				
	Presentation material																				
	Presentations																				
Course fulfilment																a			Aláírás, félévközi jegy már nem pótolható		
Planned exams																					

Artificial Intelligence 2
Course Code: IVM436AN
Semester: Spring 2018/2019 2.

Course Syllabus
Schedule: Friday, 11:15-12:45, every week
Location: PTE MIK, A-118

Attendance:

Attending is required according to the university's attendance code. Attending is required all classes, and may impact the grade (only positively). In case of unexcused absences from more than 30% of the total number of lesson will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

Test and presentation:

There will be 1 Test by the students. All tests are in writing. Tests are evaluated by points. Tests covers all or some of the main topics of the Course. No external aids are allowed to be used. In case the test is missed it is calculated as 0 points. There is only 1 retake option for the test. In case the performance is below 50%, the test is said to be failed, the Student cannot enter the Exam Period, ie it is grounds for failing the course.

Students will give presentations on preliminary discussed topics. Missed or unsatisfactory presentations will be grounds for failing the class.During the exam period students cannot correct or replace the missed presentations.

Exam:

Pre-exam of the Students can be done during the Study Period in case the Student has met the requirements of the attendance and successfully performed the presentations. Pre-exams are equal to Exams taken in the Exam Period.

Exams of the Students can be done during the Exam Period. The exam has two main parts that will test the Students' knowledge and problem-solving skills on all preceding lectures of the Course as well as the Presentations held by other Students'. The first written part is approximately 30 mins. It covers all or some of the main topics of the Course. In case the performance is below 50%, the exam is said to be failed. In case the achievement is above 50%, then the oral part of the exam is entered automatically.

No external aids are allowed to be used.

Evaluation + Grading
Grading will follow the course structure with the following weight:
- Exam: 100%
- Please note that attendance will also be assessed according to participation, progress, effort and attitude, during the oral part of the exam, however it will only affect positively one's grade and will not adversely affect one's grade.

The final grade will be based on the following guidelines:

5. Outstanding work. Execution of work is thoroughly complete and demonstrates a superior level of achievement overall with a clear attention to detail. The student is able to synthesize the course material with new concepts and ideas in a thoughtful manner, and is able to communicate and articulate those ideas in an exemplary fashion.

4. High quality work. Student work demonstrates a high level of craft, consistency, and thoroughness throughout the work. The student demonstrates a level of thoughtfulness in addressing concepts and ideas, and participates in group discussions. Work may demonstrate excellence but less consistently than a '5' student.

3 Satisfactory work. Student work addresses all of the project and assignment objectives with few minor or major problems. Works performed are complete and satisfactory, exhibiting minor problems in detail.

2. Less than satisfactory work. The work is substandard, incomplete in significant ways, and lacks craft and attention to detail.

Faculty of Engineering and Information Technology University of Pécs, H-7624 Pécs, Boszorkány u. 2., HUNGARY
Phone: +36 72 503 650
e-mail: informatics@mik.pte.hu

Artificial Intelligence 2
Course Code: IVM436AN
Semester: Spring 2018/2019 2.

Course Syllabus
Schedule: Friday, 11:15-12:45, every week
Location: PTE MIK, A-118

1. Unsatisfactory work. Work exhibits several major and minor problems with basic conceptual premise, lacking both intention and resolution; and is weak in clarity, craft and completeness.

Grading Scale:

Numeric Grade:	5	4	3	2	1
Evaluation in points:	91%-100%	81%-90%	71%-80%	51%-70%	0-50%

Students with Special Needs:
Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

Readings and Reference Materials:
Required:

1. Stuart Russell, Peter Norvig: Artificial Intelligence. A Modern Approach. Prentice Hall. 2003. ISBN 0137903952. (In Hungarian: Mesterséges intelligencia modern megközelítésben. Panem. 2005. ISBN 963 545 411 2.)
2. Ba Vindra K. Ahuja, Thomas L. Magnant and James B. Orlin: Network Flows, Theory, Algorithms, and Applications. Prentice Hall, 1993. ISBN 0-13-617549-X.
3. IBM supplementary material**.**
4. Selected journal articles.