

General Information:

Name of Course:	ARTIFICIAL INTELLIGENCE
Course Code:	IVM435ANMI, IVM435MLMI, IVM435MNMI
Semester:	First
Number of Credits:	3
Allotment of Hours per Week:	2 Lectures /Week
Evaluation:	Exam
Prerequisites:	-
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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 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.

The Course includes:

- A lecture day for the theoretical background.
- A practical day at IBM, Budapest.
- 1 short presentation by the Students based on the instructions of the Lecturer is optional.
- 1 test.
- Exam in two stages (after the Schedule of the Course).

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.
- A short oral presentation by the Students at a fixed time during the semester.
- Tests by the Students at a fixed time during the semester.

Schedule:

The rough outline of the schedule is as follows:

Week 1.

Week 2. Theoretical background. Introduction. General concept and definitions of artificial intelligence. History. State space representations. Graph theory. Search algorithms. Party problems. Problem reduction. Decomposition. Hypergraphs. Games. Partial evaluation algorithms. Neural nets. Agents. Genetic algorithms. Knowledge representation. Semantic networks. Bayes Model. Fuzzy sets and models. Event cases. Presentation by students.

Week 3.

Week 4.

Week 5.

Week 6.

Week 7. Day at IBM, Budapest.

Week 8.

Week 9. Intermission

Week 10.

Week 11.

Week 12.

Week 13.

Week 14. Pre-exam.

Week 15.

Presentations by the students.

Student may receive a topic to present. The theme should be worked on at home, independently and the results should be presented in front of everybody at a specific date. Presentations should be 10-15 minutes long (min. 10 slides). Presentations should include one or more details highlighted, for example the scope of services, ideas implemented, processes used, technologies involved, besides the business model canvas of the subject. The presentation slides should be sent electronically before week 10. Based on the content of the document, 0 - +25% as presentation credit will be given at the final evaluation.

Criteria of evaluation:

1. The scale of the presentation
2. Clear verbal and visual communication
3. Observance of the available time interval

After the presentations, common evaluation and questions can be addressed to the presenter!

In case the presentation is missed or it is not successfully performed, it is neglected. Presentations can only be completed during the Study Period.

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

Attendance:

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.

All students have to attend IBM, Budapest; in case a student does not attend this day the Student cannot enter the Exam Period, ie it is grounds for failing the course.

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 presentation. 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 including the credit for the presentation: 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 an '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.

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:	90%-100%	80%-89%	70%-79%	51%-69%	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. Ercsey Zsolt és Achs Ágnes, ARTIFICIAL INTELLIGENCE MESTERSÉGES INTELLIGENCIA EGYETEMI OKTATÁSI SEGÉDLET, ISBN 978-963-429-195-4.

More:

- Alison Cawsey: The Essence of Artificial Intelligence. Prentice Hall. 1998. ISBN-13: 978-0135717790 (In Hungarian: Mesterséges intelligencia, alapismeretek. Panem. 2002. ISBN 963 545 285 3.)
- 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.)
- Mesterséges intelligencia. Szerkesztette: Futó Iván. Aula Kiadó. 1999. ISBN 963 9078 99 9.

		Szorgalmi időszak, oktatási hetek															Vizsgaidőszak						
2018/2019. II. félév		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	1.	2.	3.	4.	5.		
Előadás tematika sorszáma									Szünet										Aláírás, félévközi jegy már nem pótolható				
Elővizsga / Zárhelyi dolgozat																							
Zárhelyi pótlás, javítás																							
Otthoni munka	Kiadás / választás																						
	beadási határidők																						
Egyebek	Beszámolók																						
Aláírás / Félévközi jegy megadása															a	a							
Vizsgák tervezett időpontjai																							

2019. 09. 03.

Dr. Ercsey Zsolt