

COURSE RECORD

Code	ECE 646
Name	Artificial Intelligence
Hour per week	3+0 (Theory + Practice)
Credit	3
ECTS	7,5
Level/Year	Undergraduate/Graduate
Semester	Spring
Type	Elective
Location	
Prerequisites	Art of Computing, Object Oriented Programming, Calculus, Probability and Statistics, Linear Algebra,
Special Conditions	
Coordinator(s)	Mustafa Coşkun
Webpage	
Content	This course provides an introduction to Artificial Intelligence. In this course, we will learn the concepts that underlie intelligent systems. Topics we will cover include problem solving with search, constraint satisfaction, knowledge representation and reasoning using some probabilistic learnings and first order logics, reasoning under uncertainty, introduction to machine learning, and introduction to reinforcement learning.
Objectives	01. Gain an understanding of artificial intelligence methodologies 02. Learn the techniques used for developing artificial intelligence models 03. Gain practice by coding programming assignments 04. Apply the concepts to a real problem by completing a course project
Learning Outcomes	L01. Explain the mathematical and algorithmic principles of artificial intelligence models L02. Solve a machine learning problem using artificial intelligence methods L03. Implement a reinforcement learning model using a software L04. Apply a deep learning method to a real problem
Requirements	A GPA higher than 3.0 or high letter grades from prerequisite courses.
Reading List	1. AI: A Modern Approach, 3ed, by Stuart Russell and Peter Norvig 2. An Introduction to Reinforcement Learning, Sutton and Barto, 1998
Ethical Rules and Course Policy	Cheating in assignments and exams is strictly prohibited.

LEARNING ACTIVITIES

Activities	Number	Weight (%)
Lectures (on-site)	14	30%
Lectures (online videos)	7	20%
Problem solving and assignments	12	30%
Project and Presentations	1	20%
	Total	100

ASSESSMENT

Evaluation Criteria	Weight (%)
Quizzes	10%

Homework Assignments	30%
Project Assignment and Presentation	20%
Midterm Exam	20%
Final Exam/Submission	20%
Total	100%

For a detailed description of grading policy and scale, please refer to the website <https://goo.gl/HbPM2y> section 28.

COURSE LOAD

Activity	Duration (hour)	Quantity	Work Load (hour)
Lectures	3	14	42
Research (web, library)	5	1	5
Required Readings	1	14	14
Online course videos	1	7	7
Assignments	7	12	84
Project	40	1	40
Pre-work for Presentation	4	1	4
Pre-work for Quizzes	1	5	5
Pre-work for Midterm	20	1	20
Pre-work for Final	30	1	30
General Sum			251

ECTS: 10 (Work Load/25-30)

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6
LO1	5	5	3	3	3	3
LO2	5	5	4	4	4	3
LO3	4	5	5	5	3	3
LO4	4	5	5	5	5	4

* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

WEEKLY SCHEDULE

W	Topic	Outcomes
1	Introduction and Intelligent Agents Activity: Online video lectures, readings	L01, L02
2	Uninformed Search and Informed Search Activity: Online video lectures, readings, homework	L01, L02, L03
3	Search for Optimization Activity: Online video lectures, readings, quiz, homework	L01, L02, L03
4	Search for Optimization, Adversarial Search Activity: Online video lectures, readings, homework	L01, L02, L03
5	Adversarial Search, Review of Search Activity: Online video lectures, readings, homework	L01, L02, L03, L04
6	Propositional Logic and Inference in Propositional Logic, First Order Logic Activity: Readings, quiz, homework	L01, L02, L03, L04
7	Midterm Exam	L01, L02
8	Semester break	
9	Probabilistic Inference, Bayesian Networks Activity: Online video lectures, readings, homework	L01, L02, L03, L04
10	Machine Learning, Probabilistic Classification Activity: Readings, quiz, homework	L01, L02, L03, L04
11	Artificial Neural Networks, Evaluating Learning Algorithms Activity: Readings, quiz, homework	L01, L02, L03

12	Sequential Decision Making	L01, L02, L03
	Activity: Readings, homework	
13	Reinforcement Learning -1	L01, L02, L03
	Activity: Readings, homework	
14	Reinforcement Learning-2	L01, L02, L03,
	Activity: Readings, homework, quiz	L04
15	Deep Reinforcement Learning	L01, L02, L03,
	Activity: Online video lectures, readings, homework	L04
13	Final exam	L01, L02, L04
	Activity: Project presentations	

Prepared by
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