EASTERN MEDITERRANEAN UNIVERSITY · DEPARTMENT OF COMPUTER ENGINEERING

AING201 | CMPE461 | CMSE461 Artificial Intelligence

Course Outline · Fall 2026-2027

1–4 · GENERAL INFORMATION

1. Course code and name	**AING201/CMPE461/CMSE461** **Artificial Intelligence**
2. Credits & category	

Credits	Contact hours	Categorization of credits	Course type
4	**6**	Engineering topic	Technical Elective Course

3. Instructor	**Dr. Saeid Asgharzadeh**
4. Textbook	**Artificial Intelligence: A Modern Approach**, Stuart Russell and Peter Norvig, 4th Edition, Pearson Education, 2022. eBook ISBN-13: 978-1-292-40117-1

5 · SPECIFIC COURSE INFORMATION

a. Brief course contents (catalog description)	Definitions of AI from different point of views, intelligent agents and agent architectures, rational intelligent agents, how agents should act and environments of intelligent agents. Problem solving agents, formulating problems, and searching for solutions. Uninformed search strategies: BFS, DFS, DLFS, IDFS. Informed search methods: Greedy algorithms, uniform cost search, heuristic functions, A*-search. Constraint satisfaction problems (CSPs): Definitions, Backtracking search for CSPs, The structure of CSPs. Adversarial search: Games, Optimal decisions in games. Alpha-Beta pruning. Agents that reason logically: knowledge-based agents, representation of knowledge, reasoning, logic, and inference in propositional logic. First-order logic: syntax and semantics, extensions and notational variations, elements of first order logic, and inference in first-order logic. Reinforcement learning and Markov decision processes.
b. Prerequisites or co-requisites	**CMPE211 or CMSE211** for CMPE and CMSE students. Students from other departments are expected to have programming knowledge in C, C++, Java or Python.
c. Course status	Technical Elective Course

6 · SPECIFIC GOALS FOR THE COURSE

a. Specific outcomes of instruction

#	Outcome	SO
i	Students are expected to understand basic topics of the field of artificial intelligence including forms of intelligence, intelligent agents and their architectures.	**SO 1**
ii	How rational intelligent agents represent knowledge, make reasoning and perform search in their environment towards achieving their goals.	**SO 1**
iii	Students are also taught basics of constraint satisfaction search and adversarial search that are used in solution of many engineering problems and game playing, respectively.	**SO 1**
iv	As the last subject covered in the course, reinforcement learning and Markov decision processes (MDPs) are covered to discuss the learning concept, action selection, state-value and policy concepts in uncertainty environments.	**SO 1, SO 6**
v	With the presented background, the students gain fundamental knowledge in AI so that they can continue with applied projects or advanced research topics after graduation.	**SO 6**

b. Student outcomes addressed

SO	Description
SO 1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
SO 6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7 · BRIEF LIST OF TOPICS TO BE COVERED

Topics

#	Topic
i	Definitions of AI from different point of views will be discussed. The four common AI approaches, acting humanly, thinking humanly, acting rationally, and thinking rationally, will be discussed in detail.
ii	**Intelligent agents:** How agents should act. Structure of intelligent agents. Environments.
iii	**Problem solving agents**, formulating problems, and searching for solutions. Uninformed search strategies: BFS, DFS, DLFS, IDFS. Informed search methods: Greedy algorithms, uniform cost search, heuristic functions, A*-search.
iv	**Constraint satisfaction problems (CSPs):** Definitions, Backtracking search for CSPs, The structure of problems. **Adversarial Search:** Games, Optimal decisions in games. Alpha-Beta pruning.
v	**Agents that reason logically:** A knowledge-based agent. Representation, reasoning, and logic. Propositional logic.
vi	**First-order logic:** Syntax and semantics. Extensions and notational variations. Reasoning in first order logic.
vii	**Reinforcement learning:** basic principles and introduction to Markov decision processes.
viii	Discounted Bellman equation, value learning and policy learning algorithms.
ix	**Temporal difference learning:** Q-learning, actor-critic learning and SARSA algorithms.

8 · ASSESSMENT

Grading

Component	Weight
Midterm examination	**40%**
Final examination	**55%**
Attendance	**5%**
Total	**100%**