

**School of Engineering and Natural Sciences / Computer Engineering (English)**

**2022 - 2023 Academic Year**

**INTRODUCTION to AI**

**Syllabus**

<b>Course Description</b>					
<b>Name</b>	<b>Code</b>	<b>Semester</b>	<b>T+A Hour</b>	<b>Credit</b>	<b>ECTS</b>
INTRODUCTION to AI	COE4213564	Spring Semester	3+0	3	6
<b>Prerequisites Courses</b>	VERİ YAPILARI				
<b>Recommended Elective Courses</b>	Data Structures				
<b>Language of Instruction</b>	English				
<b>Course Level</b>	First Cycle (Bachelor's Degree)				
<b>Course Type</b>	Elective				
<b>Course Coordinator</b>	Prof.Dr. Selim AKYOKUŞ				
<b>Name of Lecturer(s)</b>	Prof.Dr. Selim AKYOKUŞ				
<b>Assistant(s)</b>					
<b>Aim</b>	The objective of this course is to introduce and teach the fundamentals of problems, theories, algorithms and applications of Artificial Intelligence (AI). AI is a very fast-growing field that focuses on building intelligent systems that will have a great impact on every area of industry, economy, and social life. The topics include definition and history of AI, problem solving via search, game playing, knowledge representation, propositional logic, first-order predicate logic, logical and probabilistic reasoning, planning, uncertain knowledge and reasoning, machine learning (popular machine learning algorithms, deep learning, reinforcement learning, and genetic algorithms), natural language processing, deep learning for natural language processing, computer vision and robotics.				
<b>Course Content</b>	This course contains; Introduction and Intelligent Agents, Problem Solving by Searching, Adversarial Search and Games, Constraint Satisfaction Problems, Logical Agents, First-Order Logic, Inference in First-Order Logic, Knowledge Representation, Automated Planning, Uncertain knowledge and reasoning, Exam week, Probabilistic Programming, Making Simple Decisions, Making Complex Decisions, Machine Learning, Deep Learning, Reinforcement Learning, Natural Language Processing, Deep Learning for Natural Language Processing, Computer Vision, Robotics, Review and presentations.				
<b>Course Learning Outcomes</b>			<b>Teaching Methods</b>	<b>Assessment Methods</b>	
Students will have an in-depth understanding of core areas of AI.			1, 4	A, C, D	
Students will learn and gain an understanding of various search methods, knowledge representation, uncertainty, reasoning, machine learning, natural language processing, computer vision and robotics.			1, 4	A, C, D	
Students will be able to choose the appropriate algorithm for solving an AI problem.			1, 4	A, C, D	
Students will be introduced to the current research in artificial intelligence and encouraged to define research problems and develop effective solutions.			1, 4	A, C, D	
<b>Teaching Methods</b>	1: Lecture, 4: Exercise, Practice				
<b>Assessment Methods</b>	A: Written Exam, C: Homework, D: Project / Design				
<b>Lecture Schedule</b>					
<b>Sequence</b>	<b>Topics</b>	<b>Preliminary Preparation</b>			
1	Introduction and Intelligent Agents				
2	Problem Solving by Searching				
3	Adversarial Search and Games				
4	Constraint Satisfaction Problems				
5	Logical Agents				
6	First-Order Logic, Inference in First-Order Logic				
7	Knowledge Representation, Automated Planning				
8	Uncertain knowledge and reasoning				
9	Exam week				
10	Probabilistic Programming, Making Simple Decisions, Making Complex Decisions				
11	Machine Learning				
12	Deep Learning, Reinforcement Learning				
13	Natural Language Processing, Deep Learning for Natural Language Processing				
14	Computer Vision, Robotics				
15	Review and presentations				
<b>Evaluation Methods</b>		<b>Weight(%)</b>			
Midterm Exam		30			
General Exam		70			

<b>Resources</b>
Artificial Intelligence: A Modern Approach, 4th Edition, by Stuart Russell and Peter Norvig, Pearson Education, 2021.- Speech and Language Processing by Jurafsky and Martin, 2021.
- G. F. Luger, Artificial Intelligence, Addison-Wesley, 2002.
- Lectures notes ve web resources in AI.