T.C.

ESKİŞEHİR OSMANGAZİ UNİVERSİTY

FACULTY OF SCIENCES

MATHEMATICS AND COMPUTER SCIENCES DEPARTMENT

COURSE INFORMATION FORM

Course Name	Course Code
Applications of Advanced Artificial Intelligence I	

Semester	Number of Course Hours per Week		Credit	ECTS
	Theory	Practice		
7	2	2		6

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
	X			

Course Language	Course Level	Course Type
Turkish	Undergraduate	Compulsory

Prerequisite(s) if any	Fundamentals of Artificial Intelligence, Fundamentals of Machine Learning, Data Science, and Statistics
Objectives of the Course	This course aims to teach students the fundamental principles of artificial intelligence and machine learning, and to equip them with skills in data analysis, modeling, and developing practical AI solutions.
Short Course Content	The course covers the basics of artificial intelligence and machine learning, deep learning algorithms, data analysis and processing techniques, model evaluation and hyperparameter optimization, AI tools and applications, interpretation of model results, and ethical implications.

	Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1	Students will understand advanced concepts, types, and techniques of artificial intelligence.	1, 2	1, 2, 4	A
2	Students will be able to develop solutions to real-world problems using various AI techniques.	3, 4	1, 4, 6, 10	A
3	Students will create various AI models and determine appropriate solution strategies by analyzing model results.	2, 4	1, 6, 10	A
4	Students will gain the ability to effectively use AI software to carry out projects.	3, 5	3, 5, 6, 11	A

***Teaching Methods** **1:**Expression, **2:**Discussion, **3:**Experiment, **4:**Simulation, **5:**Question-Answer, **6:**Tutorial, **7:**Observation, **8**:Case Study, **9:**Technical Visit, **10:**Trouble/Problem Solving, **11:**Induvidual Work, **12**:Team/Group Work, **13**:Brain Storm, **14:**Project Design / Management, **15:**Report Preparation and/or Presentation

****Measuring Methods** **A:**Exam, **B:**Quiz, **C:**Oral Exam, **D:**Homework, **E:**Report, **F:**Article Examination, **G:**Presentation, **I:**Experimental Skill, **J:**Project Observation, **K**:Class Attendance; **L**:Jury Exam

Main Textbook	Artificial Intelligence : A Modern Approach (Second Edition), Stuart Russell and Peter Norvig, Prentice-Hall, 2003, ISBN: 0-13-790395
Supporting References	Ant Colony Optimization, Marco Dorigo and Thomas Stützle, MIT Press, 2004. ISBN: 0-262-04219-3. Artificial Intelligence, Patrick H. Winston, Addison-Wesley, 1992. ISBN: 0-201-533774.

Course Schedule	
1	Fundamentals of Artificial Intelligence and Machine Learning
2	Deep Learning: Basic Structures and Algorithms
3	Data Analysis and Preprocessing Techniques
4	Application of Machine Learning Models
5	Hyperparameter Optimization and Model Evaluation
6	Big Data and Data Management Techniques
7	AI Tools and Software Development
8	Midterm Exam
9	Interpretation of Model Results and Insights
10	Ethical and Social Impacts of Artificial Intelligence
11	Evaluation of Various AI Methods
12	AI Applications
13	Project Management Techniques
14	Current Research and Innovations
15	AI Solutions for Real-World Problems
16,17	Final Exam

Calculation of Course Workload			
Activities	**Number**	**Time (Hour)**	**Total Workload (Hour)**
Course Time (number of course hours per week)	14	4	56
Classroom Studying Time (review, reinforcing, prestudy,….)	14	3	42
Homework	5	3	15
Quiz Exam			
Studying for Quiz Exam			
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	20	20
Final Exam	1	2	2
Studying for Final Exam	1	30	30
		Total workload	**167**
		Total workload / 30	**5,5**
		Course ECTS Credit	**6**

Evaluation	
Activity Type	**%**
Mid-term	50
Quiz	
Homework	
Bir öğe seçin.	
Bir öğe seçin.	
Final Exam	50
Total	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	**PROGRAM OUTCOME**	**Contribution**
1	Understanding the fundamental principles of artificial intelligence and machine learning methods.	5
2	Understanding deep learning algorithms and applications.	5
3	Preparing datasets using data analysis and processing techniques.	5
4	Applying and evaluating machine learning and deep learning models.	5
5	Performing hyperparameter optimization to improve the performance of AI systems.	5
6	Using appropriate data management techniques to work with large datasets.	4
7	Using software development tools and techniques for AI applications.	4
8	Interpreting model results to obtain meaningful insights.	3
9	Analyzing the ethical and social impacts of AI systems.	3
10	Evaluating the advantages and disadvantages of various AI methods.	4
11	Applying AI solutions in practical applications.	5
12	Using project management techniques in AI projects.	3
13	Keeping up with current research and innovations in deep learning and AI.	4
14	Designing and implementing AI solutions for real-world problems.	5
15	Supporting the sustainable use of AI systems.	4

LECTUTER(S)				
Prepared by	Doç. Dr. Özer Çelik			
Signature(s)				

Date:06.06.2024