COURSE INFORMATION FORM

Course Name	Course Code
Applications of Advanced Artificial Intelligence II	

Semester	Number of Course Hours per Week		Credit	ECTS
	Theory	Practice		
8	2	2		6

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

Course Language	Course Level	Course Type
Turkish	Undergraduate	Elective

Prerequisite(s) if any	Advanced Machine Learning, Deep Learning and Neural Networks, Big Data Analysis
Objectives of the Course	This course aims to teach students advanced artificial intelligence and machine learning techniques and develop their ability to create practical solutions for complex datasets.
Short Course Content	Advanced artificial intelligence and machine learning techniques, advanced structures in deep learning, big data processing, complex model design, high-performance computing, security and ethical analysis, industrial and academic applications, scientific research, and project management topics are covered.

	Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1	Students will understand advanced AI concepts and techniques.	1, 2	1, 2, 4, 6	A
2	Students will be able to develop solutions on complex datasets using advanced AI techniques.	3, 4	1, 6, 8, 10	A
3	Students will create advanced AI models and analyze their performance.	2, 4	1, 6, 10	A
4	Students will gain the ability to carry out AI projects using high-performance computing techniques.	3, 5	6, 14, 15	A
5	Students will acquire knowledge of the security and privacy of AI systems and be able to implement applications in these areas.	5, 6	1, 6	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:**Induvidual/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	Advanced Artificial Intelligence and Machine Learning Techniques
2	Advanced Structures and Applications in Deep Learning
3	Big Data Processing and Analysis Methods
4	Design and Optimization of Complex AI Models
5	Advanced Machine Learning Projects
6	High-Performance Computing Techniques
7	Security and Privacy in AI Systems
8	Midterm Exam
9	Industrial and Academic Applications
10	Ethical and Legal Analysis of AI Systems
11	Conducting Research and Publishing Scientific Papers
12	Project Management and Risk Analysis
13	Advanced Data Analysis and Visualization Techniques
14	International Standards and Artificial Intelligence
15	Innovations and Trends
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	Gaining knowledge about advanced techniques and algorithms in artificial intelligence and machine learning	5
2	Understanding advanced deep learning structures and applications	5
3	Applying big data processing and analysis methods for AI systems	5
4	Designing and optimizing complex AI models	5
5	Developing advanced projects in machine learning and deep learning	5
6	Using high-performance computing techniques in AI systems	5
7	Possessing knowledge and skills related to the security and privacy of AI applications	4
8	Evaluating industrial and academic applications of AI systems	4
9	Analyzing the ethical, legal, and social implications of AI solutions	4
10	Conducting research and publishing scientific papers in the field of AI and machine learning	4
11	Performing project management and risk analysis for AI systems	4
12	Using advanced data analysis and visualization techniques	4
13	Evaluating the compliance of AI solutions with international standards	4
14	Keeping up with innovations and trends in the AI field	4
15	Developing an understanding of entrepreneurship and innovation in AI applications	4

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

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