Module (Artificial Intelligence) Catalogue

2023-2024

College/ Institute	Erbil Technology College	
Department	Information & Communication Technology Engineering (ICTE)	
Module Name	Artificial Intelligence	
Module Code	ARI805	
Degree	Technical Diploma [ ] Bachelor [x] High Diploma [ ] Master [ ] PhD [ ]	
Semester	Eighth Semester	
Qualification	Ph.D.	
Scientific Title	Lecturer	
ECTS (Credits)	4	
Module type	Prerequisite [ ] Core [x] Assist. [ ]	
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	(91)Total hrs Workload
Weekly hours (Practical)	(2)hr Class	(71)Total hrs Workload
Number of Weeks	15	
Lecturer (Theory)	Chiman haidar salh	
E-Mail & Mobile NO.	Chiman.salh@epu.edu.iq	
Lecturer (Practical)	Chiman haidar salh	
E-Mail & Mobile NO.	Chiman.salh@epu.edu.iq	
Websites		

Course Book

<table>
<tr><td>Course Description</td><td colspan="5">This course will introduce the basic principles and concepts in artificial intelligence. It will cover; problem-solving using search techniques, searching algorithms, planning techniques, AI planning, Ai uncertainty, machine learning and machine learning algorithms. Then Advanced AI subjects such as; Fuzzy systems, Natural language processing, Artificial vision, and Robotics. Finally, the AI ethics.</td></tr>
<tr><td>Course objectives</td><td colspan="5">The main aims and objectives are:
• To appreciate and understand the principles of AI and the ethical issues concern with it.
• To have basic proficiency in a traditional AI language, including writing simply to intermediate programs and understanding code are written in that language.
• To understand the fundamental issues of knowledge representation and blind and heuristic search.
To have a basic understanding of some of the more advanced topics of AI such as fuzzy systems, natural language processing, agents and robotics.</td></tr>
<tr><td>Student's obligation</td><td colspan="5">Attending the lectures is the key to success and pass the exam. Quizzes will be held during the lecture. The students should do an assignment and they must pass the practical exam too.</td></tr>
<tr><td>Required Learning Materials</td><td colspan="5">The ways that we are using in our teaching for this course are:
1. Data show.
2. White Board.
3. Word Documents.
4. Notebook.
5. Group activity
6. Computer Lab</td></tr>
<tr><td rowspan="12">Evaluation</td><td colspan="2">Task</td><td>Weight (Marks)</td><td>Due Week</td><td>Relevant Learning Outcome</td></tr>
<tr><td colspan="2">Paper Review</td><td>0</td><td></td><td></td></tr>
<tr><td rowspan="6">Assignments</td><td>Homework</td><td>5</td><td></td><td></td></tr>
<tr><td>Class Activity</td><td>2</td><td></td><td></td></tr>
<tr><td>Report</td><td>5</td><td></td><td></td></tr>
<tr><td>Seminar</td><td>5</td><td></td><td></td></tr>
<tr><td>Essay</td><td>0</td><td></td><td></td></tr>
<tr><td>Project</td><td>0</td><td></td><td></td></tr>
<tr><td colspan="2">Quiz</td><td>8</td><td></td><td></td></tr>
<tr><td colspan="2">Lab.</td><td>10</td><td></td><td></td></tr>
<tr><td colspan="2">Midterm Exam</td><td>25</td><td></td><td></td></tr>
<tr><td colspan="2">Final Exam</td><td>40</td><td></td><td></td></tr>
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	Total	100		
Specific learning outcome:	At the end of this course the student will be able to: • Understanding the fundamentals of AI • Understanding the problem and problem solving techniques using searching • learning about machine learning, its types, and algorithms • Distinguish between the searching techniques • Knowledge representation • Planning methods and techniques • Understanding the fundamental conceptacles of Fuzzy systems • Natural language processing, Artificial vision, and Robotics • Understanding the Societal and ethical concerns with AI Plan, design and implement problems in Prolog			
Course References:	• Nils J. Nilsson (2008), "Artificial Intelligence: A new Synthesis", Morgan Kaufmann Inc. • Stuart Russell and Peter Norvig, (2002), "Artificial Intelligence: A Modern Approach", Prentice Hall. • George F. Luger, (2002), "Artificial Intelligence: Structures and Strategies for Complex Problem Solving", Chapter, Addison-Wesley, • Thomas Dean, (1994), "Artificial Intelligence: Theory and Practice", Addison-Wesley, • S. Rajasekaran and G.A. Vijayalaksmi Pai, (2005), "Neural Network, Fuzzy Logic, and Genetic Algorithms - Synthesis and Applications", Prentice Hall.			

Course topics (Theory)	**Week**	**Learning Outcome**
Introduction to Artificial Intelligence, foundations of AI, the historical evolution of AI, and AI classification	1	foundations of AI
Intelligent Agents; types of agents, intelligent agents, and agent environment	2	Intelligent Agents
Problem-solving using search algorithms	4	Problem-solving
Problem-solving using Uninformed (Blind) search including; Breadth-first Search and Depth-first Search	5	Breadth-first Search and Depth-first Search
Problem-solving using Uninformed (Blind) search including; Depth-limited Search	6	Depth-limited Search
Problem-solving using Informed search (Heuristic search) using; Best first search, A* search, and Greedy search	7	Best first search, A* search, and Greedy search

Problem-solving using Informed search (Heuristic search) using; Graph Search	8	Graph Search
Machine Learning: Supervised machine learning including; Decision tree and KNN	9	Decision tree and KNN
Unsupervised machine learning, including; K-means clustering	10	K-means clustering
Classification clustering	11	Classification
Regression and decomposition	12	Regression and decomposition
Advanced AI; Fuzzy systems, Natural language processing, Artificial vision, and Robotics	13	Artificial vision, and Robotics
AI and Societal/ethical concerns	14	ethical concerns
Practical Topics	**Week**	**Learning Outcome**
Introduction to Prolog language	1,2	Prolog
Facts, rules, and variables, Questions types	3	Facts, rules
Interdependence and retrieval	4	retrieval
Built-in Boolean and Mathematical Functions	5	Mathematical Functions
programming examples of read and write functions	6	of read and write functions
Cut & Fail functions, Repeat & Recursion	7	Cut & Fail functions
Tail & non- Tail Recursion	8	Recursion
String in Prolog	9	string
List in Prolog	10	list
Database in Prolog	11	database
Files in Prolog	12	files
Preparatory Week	13	Preparatory

Questions Example Design

Q1/

Q2/

Q3/

Extra notes:

Please take this note into consideration:
Making the topics covered in the semester compatible with reality of the educational process due to the national and religious holiday or other reasons. For instance, covering more than 80% of the prescribed subjects to improve the scientific level of students and preserve the standardization of diploma programs.

External Evaluator

I have been reviewed this course book, and it's perfect and fit for this subject at the level of institute student, so I have no suggestion.

Zanyar Shwan Ahmed
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