



Ministry of Higher Education and
Scientific Research - Iraq
University of Diyala
College of Artificial Intelligence
Engineering Technology
Department of Artificial Intelligence
Engineering



الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Fundamentals of Artificial Intelligence Algorithms		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	AIE 106		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	AI. Eng.	College	College of Artificial Intelligence Engineering Technology
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	10/11/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	



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Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	The main aims and objectives are: <ol style="list-style-type: none">1. To appreciate and understand the principles of AI and the ethical issues concern with it.2. To have basic proficiency in a traditional AI language, including writing3. simply to intermediate programs and understanding code are written in that4. language.5. To understand the fundamental issues of knowledge representation and blind and heuristic search.6. To have a basic understanding of some of the more advanced topics of AI such as fuzzy systems, natural language processing, agents and robotics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this course the student will be able to: <ul style="list-style-type: none">• 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
Indicative Contents المحتويات الإرشادية	Daily exams with practical and scientific questions. * Participation marks for difficult competition questions among students. * Setting grades for homework assignments and reports assigned to them. Quarterly exams for the curriculum, in addition to the mid-year exam and final exam.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<ol style="list-style-type: none">1. Introducing the students to practical exams, team works, prepare students for Higher education.2. Teach students how to be creative and to work in teams for innovations.3. Prepare students to be ready to be involved in national and international
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5)	7 and 14	LO #2 and #5
	Assignments	2	10% (5)	11 and 13	LO #4 and #5
	Projects / Lab.	1	10% (10)	Continuous	All
	Participation & Attendance	1	10% (10)	Continuous	All
Summative assessment	Midterm Exam	2 hr	10% (10)	9	LO #1 - #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered



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Week 1	Introduction to Artificial Intelligence, foundations of AI, the historical evolution of AI, and AI classification
Week 2	Intelligent Agents; types of agents, intelligent agents, and agent environment
Week 3	Problem-solving using search algorithms
Week 4	Problem-solving using Uninformed (Blind) search including; Breadth-first Search and Depth-first Search
Week 5	Problem-solving using Uninformed (Blind) search including; Depth-limited Search
Week 6	Quiz1
Week 7	Problem-solving using Informed search (Heuristic search) using; Best first search, A* search, and Greedy search
Week 8	Problem-solving using Informed search (Heuristic search) using; Graph Search
Week 9	Machine Learning: Supervised machine learning including; Decision tree and KNN
Week 10	Unsupervised machine learning, including; K-means clustering
Week 11	Classification clustering
Week 12	Regression and decomposition
Week 13	Advanced AI; Fuzzy systems, Natural language processing, Artificial vision, and Robotics
Week 14	Quiz2
Week 15	Mid Exam
Week 16	AI and Societal/ethical concerns

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		
Recommended Texts	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:	



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	<p>Structures and Strategies for Complex Problem Solving", Chapter, AddisonWesley,</p> <ul style="list-style-type: none"> • 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. 	
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
<p>Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p>				