MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Artificial Intelligence**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**IT3102**			☒ **Practical**	
ECTS Credits	**5**			☒ **Lecture**	
SWL (hr/sem)	**150**			☒ **Lab**	
				☒ **Seminar**	
Module Level	UGIII		**Semester of Delivery**	1	
Administering Department	Information Technology		**College**	College of Computer Science and Information Technology	
Module Leader	Ali Mahmoud Ali		**e-mail**	ali.abdulhussein19@uowa.edu.iq	
Module Leader's Acad. Title	Asst. Lecture		**Module Leader's Qualification**	**MSc**	
Module Tutor	Ali Mahmoud Ali		**e-mail**	ali.abdulhussein19@uowa.edu.iq	
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Scientific Committee Approval Date	01/09/2026		**Version Number**	V1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	-	**Semester**	-
Co-requisites module	-	**Semester**	-

Department Head Approval **Dean of the College Approval**

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	1. Provide students with a solid and comprehensive understanding of the fundamentals, theories, and techniques of Artificial Intelligence (AI). 2. Develop practical skills that enable students to apply AI methodologies to solve real-world problems effectively. 3. Enhance students' programming abilities and strengthen their familiarity with AI-related programming languages. 4. Foster critical thinking and analytical skills in evaluating AI algorithms, methods, and models. 5. Promote teamwork, communication, and collaboration through group-based AI projects. 6. Encourage continuous learning and staying updated with current advancements and emerging trends in the field of AI.
Module Learning Outcomes	Upon successful completion of this module, students will be able to: 1. Identify and describe different types of intelligent agents and their characteristics. 2. Recognize and evaluate the characteristics, strengths, and effectiveness of various AI algorithms. 3. Apply and compare multiple knowledge representation techniques across different scenarios. 4. Formulate real-world problems creatively and translate them into AI-based problem representations.
Indicative Contents	1. Artificial Intelligence and Intelligent Agents: Overview of AI, the Turing Test, types of agents, agent environments, and agent architectures. 2. Problem Solving by Searching: State-space representation, uninformed search strategies, heuristic search, A* algorithm, local search, and search with partial observations. 3. Adversarial Search Algorithms: Optimal decision-making in competitive environments, Alpha-Beta pruning, stochastic games, and partially observable game strategies. 4. Constraint Satisfaction Problems (CSPs): Definitions of CSPs, constraint propagation, arc consistency, and local search for CSPs. 5. Knowledge Representation and Reasoning: Propositional logic, theorem proving, logic-based agents, first-order logic, forward and backward chaining, expert systems, and probabilistic reasoning.

Learning and Teaching Strategies	
Strategies	A variety of teaching and learning activities will be used, including: • **Lectures** to introduce theoretical concepts related to intelligent agents, AI algorithms, knowledge representation, and computational intelligence. • **Laboratory sessions** to practice implementing AI algorithms and developing intelligent software using programming tools. • **Group projects** where students analyze real-world problems and formulate them as AI problems. • **Presentations and discussions** to enhance communication, collaboration, and analytical thinking skills.

Student Workload (SWL)

Structured SWL (h/sem)	65	**Structured SWL (h/w)**	5
Unstructured SWL (h/sem)	85	**Unstructured SWL (h/w)**	**6**
Total SWL (h/sem)	147 + 3 final = 150		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	5	2 (10%)	2,4,6,8,10	1,2,3,4
	Homework assignment	5	2 (10%)	2,5,8,9,12	All
	Projects	1	5 (5%)	12	All
	Lab	5	3 (15%)	3,5,7,9,12	All
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	**Introduction to Artificial Intelligence**
Week 2	**Fundamentals of Artificial Intelligence**
Week 3	**Problem Solving by Searching**
Week 4	**Search Algorithms**
Week 5	**Heuristic Search Techniques**
Week 6	**Adversarial Search Algorithms**
Week 7	**Breadth-First Search**
Week 8	**Depth-First Search**
Week 9	**Midterm Examination**
Week 10	**Constraint Satisfaction Problems**
Week 11	**Forward Checking and Constraint Propagation**
Week 12	**Arc Consistency and Constrained Optimization**
Week 13	**Knowledge Representation and Reasoning**
Week 14	**Logic-Based Knowledge Representation**
Week 15	**Reasoning Methods and Inference Engines**
Week 16	**Preparatory Week before the Final Exam**

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Introduction to Python Programming (Data Types) – Tic Tac Toe implementation
Week 2	Implementing examples of AI and various environments
Week 3	Building a simple Agent-Based Model in Python
Week 4	Graph representation and visualization in Python
Week 5	Search Algorithms – Uninformed search
Week 6	Search Algorithms – Informed search
Week 7	Solving the Eight-Puzzle problem in Python
Week 8	Practical Discussion I – Small project
Week 9	Constraint Satisfaction Problems (CSP)
Week 10	Knowledge Representation in Python
Week 11	Map Coloring Problem
Week 12	N-Queen and Sudoku Problems
Week 13	Knowledge Representation using Propositional Logic in Python
Week 14	Knowledge Representation using First-Order Logic in Python
Week 15	Practical Discussion II – Small project

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Russell, Stuart J., and Norvig, Peter. Artificial Intelligence : A Modern Approach. 4th Edition. Prentice Hall Series in Artificial Intelligence. Upper Saddle River, N.J.: Prentice Hall, 2021. 1. Padhy, N. P. (2005). Artificial Intelligence and Intelligent Systems. New Delhi: Oxford University Press. 2. D. L. Poole and A. K. Mackworth, "Artificial Intelligence: Foundations of Computational Agents." Cambridge University Press, 2017. 3. G. F. Luger, "Artificial Intelligence: Structures and Strategies for Complex Problem Solving." Pearson, 2019. 4. M. Negnevitsky, "Artificial Intelligence: A Systems Approach." Pearson, 2019.	Yes
Recommended Texts	1. Padhy, N. P. (2005). Artificial Intelligence and Intelligent Systems. New Delhi: Oxford University Press. 2. D. L. Poole and A. K. Mackworth, "Artificial Intelligence: Foundations of Computational Agents." Cambridge University Press, 2017. 3. G. F. Luger, "Artificial Intelligence: Structures and Strategies for Complex Problem Solving." Pearson, 2019. 4. M. Negnevitsky, "Artificial Intelligence: A Systems Approach." Pearson, 2019. http://www.sqlcourse.com https://www.tutorialspoint.com/human_computer_interface/index.htm https:/www.hci-book.com	

Grading Scheme				
Group	**Grade**	Mark	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	Excellent	90 - 100	Outstanding Performance
	B - Very Good	Very Good	80 - 89	Above average with some errors
	C - Good	Good	70 - 79	Sound work with notable errors
	D - Satisfactory	Fair / Average	60 - 69	Fair but with major shortcomings
	E - Sufficient	Pass / Acceptable	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	Fail (Pending)	(45-49)	More work required but credit awarded
	F – Fail	Fail	(0-44)	Considerable amount of work required

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.