

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	AI with Python Programming		Module Delivery	
Module Type	Support or related learning activity		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☐ Seminar	
Module Code	PYAI11			
ECTS Credits	6.00			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery	1	
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader			e-mail	120108@uotechnology.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	None	e-mail	None	
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	1 / 4 /2026	Version Number	1.0	
Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	None		Semester	
Co-requisites module	None		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To familiarize students with Python syntax and its libraries relevant to AI. 2. To introduce key concepts in AI, such as search algorithms, basic neural networks, and decision-making systems. 3. To develop students' skills in designing and implementing AI models for practical problems. 4. To prepare students for more advanced AI topics and applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- To familiarize students with Python syntax and its libraries relevant to AI. 2- To introduce key concepts in AI, such as search algorithms, basic neural networks, and decision-making systems. 3- To develop students' skills in designing and implementing AI models for practical problems. 4- To prepare students for more advanced AI topics and applications.
Indicative Contents المحتويات الإرشادية	<u>Introduction to Python:</u> • Python basics, data types, control structures, and functions. • Overview of Python libraries for AI: NumPy, Pandas, Matplotlib, and Scikit-learn. [30 hrs] <u>Introduction to AI:</u> • Overview of AI and its applications. • Problem-solving using search algorithms: BFS, DFS, and heuristic search. [12 hrs] <u>Data Preprocessing and Analysis:</u> • Data cleaning, visualization, and exploration techniques. [6 hrs] <u>Machine Learning Basics:</u> • Supervised learning: Linear regression, logistic regression, decision trees. • Unsupervised learning: Clustering (e.g., K-Means). • Introduction to neural networks. [30 hrs] <u>Project Work:</u>

	Building a simple AI system, such as a basic recommender system or a classification model. [12 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lectures: Instructors will deliver in-class lectures to introduce and explain key concepts of AI, and python programming. These presentations will cover theoretical foundations and practical applications. Interactive Discussions: Students will be encouraged to participate in discussions that foster critical thinking and problem-solving skills. These discussions will revolve around case studies, hypothetical scenarios, and current events in AI. Hands-on Laboratory Work: Practical lab sessions will allow students to apply theoretical knowledge by supervised programming sessions where students implement concepts discussed in lectures. Group Projects: Students will collaborate on projects that involve designing and implementing practical AI models. Use of Visuals and Multimedia: Integration of visual aids such as diagrams, flowcharts, and multimedia content to enhance understanding of complex AI models. Assessment and Feedback: Regular assessments through quizzes, tests, and exams to gauge students' understanding and mastery of course content. Feedback will be provided systematically to guide students' learning processes and adjustments. Practice and Revision Sessions: Dedicated sessions for practice and revision will be available to reinforce learning, address students' questions, and prepare them adequately for assessments.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعاً

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	180		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1- #5 and #6 - #11
	Assignments	2	10% (10)	3 and 12	LO #2 and #5, #7, #11
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5 - #12
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO #1 - #10
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Python and AI
Week 2	Python Basics: Data types and Control Flow
Week 3	Functions, Modules, and File Handling
Week 4	Libraries for AI: NumPy

Week 5	Libraries for AI: Pandas
Week 6	Datasets and Information Processing
Week 7	Data Visualization with Matplotlib
Week 8	Introduction to AI Concepts
Week 9	Midterm exam
Week 10	Problem-solving with Search Algorithms
Week 11	Supervised Learning: Linear Regression
Week 12	Supervised Learning: Logistic Regression
Week 13	Neural Network Basics
Week 14	Ethical and Social Implications of AI
Week 15	Project Presentations and Review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Setting up Python Environment (Anaconda, Jupyter) (2 Experiments)
Week 2	Lab 2: Writing Basic Python Scripts (2 Experiments)
Week 3	Lab 3: Implementing Control Flow and Functions (2 Experiments)
Week 4	Lab 4: Working with NumPy Arrays (2 Experiments)
Week 5	Lab 5: Working with Pandas DataFrames (2 Experiments)
Week 6	Lab 6: Reading and processing datasets (2 Experiments)
Week 7	Lab 7: Data Visualization with Matplotlib and Seaborn (2 Experiments)
Week 8	Lab 8: Implementing Simple Search Algorithms in Python (2 Experiments)

Week 9	Lab 9: Applying BFS and DFS to Solve Problems (2 Experiments)
Week 10	Lab 10: Building a Linear Regression Model (2 Experiments)
Week 11	Lab 11: Implementing Logistic Regression (2 Experiments)
Week 12	Lab 12: Creating and Training a Simple Neural Network (2 Experiments)
Week 13	Lab 13 Working on Capstone Project (1 Experiment)
Week 14	Lab 14: Capstone Project Development (1 Experiment)
Week 15	Lab 15: Capstone Project Presentation (1 Experiment)

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1- Alpaydin, E. Introduction to Machine Learning (4th ed.). MIT Press, 2020 2- Russell, S., & Norvig, P. Artificial Intelligence: A Modern Approach (4th ed.), Pearson ,2021	
Recommended Texts	1- Raschka, S., & Mirjalili, V. "Python Machine Learning" (3rd ed.). Packt Publishing, 2019.	Yes
Websites	GeeksforGeeks - Python & AI/ML Tutorials https://www.geeksforgeeks.org/python-programming-language/	

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
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.				