	Ministry of Higher Education and Scientific Research - Iraq **Al-Naji University** **College of Engineering** **AI Engineering Department**	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer II**			**Module Delivery**	
Module Type	B			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	AIA2302				
ECTS Credits	**3**				
SWL (hr/sem)	75				
Module Level	2		**Semester of Delivery**	3	
Administering Department	AI Engineering		**College**	College of Engineering	
Module Leader	Rusul Tariq Khudhair		**e-mail**	rusul.tareq@alnaji-uni.edu.iq	
Module Leader's Acad. Title	Assit. Lect.		**Module Leader's Qualification**	M.Sc.	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	XX,XX,XXXX		**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. Introduce fundamental concepts of computer networks, security, and troubleshooting. 2. Provide a solid understanding of Artificial Intelligence (AI) principles, history, and applications. 3. Explore the ethical, social, and future implications of AI in various domains. 4. Develop programming proficiency in Python, covering syntax, data structures, and control flow. 5. Foster problem-solving skills using object-oriented programming, libraries, and database integration. 6. Equip students with practical skills to apply AI and Python tools in real-world problem contexts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of this module, students should be able to: 1. Define and explain the types of computer networks and basic security threats. 2. Apply troubleshooting techniques to solve common hardware and software issues. 3. Describe the foundations, benefits, and challenges of Artificial Intelligence. 4. Evaluate the ethical and social impacts of AI in industry and society. 5. Write and execute Python programs using correct syntax and data structures. 6. Implement control structures (loops and conditionals) in Python effectively. 7. Develop modular programs with functions, packages, and file handling. 8. Apply object-oriented principles such as inheritance, encapsulation, and polymorphism. 9. Utilize Python libraries (NumPy, Pandas, Matplotlib) for data analysis and visualization. 10. Integrate Python with databases to perform CRUD operations and connect applications.
Indicative Contents المحتويات الإرشادية	* Networking & Security: Basic network concepts, security principles, threats, troubleshooting techniques. * Artificial Intelligence: History, definitions, applications across industries, AI-driven mobile technologies, ethics, and future trends. * Python Programming: Introduction, control structures, data structures, functions, modules, file handling, exception handling, OOP. * Advanced Python Features: List comprehensions, lambda functions, iterators, generators, decorators. * Libraries & Databases: NumPy, Pandas, Matplotlib, and database connectivity with SQLite. * Assessments: Mid-term and final exams to evaluate theoretical and practical knowledge.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module employs a blended approach combining lectures, discussions, and hands-on programming exercises. Students will engage with theoretical foundations of networks and AI while applying concepts through practical labs in Python. Case studies and examples from industry will be integrated to highlight real-world applications, with particular attention to ethical considerations. Assessments, including exams and programming tasks, will reinforce learning and ensure the development of both conceptual understanding and applied problem-solving skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	12	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**75**		

Module Evaluation تقيم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	10% (10)	3 , 6 and 8	LO #3, #6 and # 8
	Lab	14	10% (10)	Continuous	All
	Projects	1	10% (10)	Continuous	All
	Home Work	4	10% (10)	Continuous	
Summative assessment	**Midterm Exam**	1hr	10% (10)	7	
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Security, Networks, and Computer Troubleshooting:** What is a network? Types of networks. Basic network components. Basic network security. Understanding network threats. Identify and solving common hardware and software problems that computer uses encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.
Week 2	**Introduction to Artificial Intelligence (AI) and the role of AI in modern smartphones:** Definition of AI. History of AI. AI techniques and approaches. Key characteristics of AI. Benefits of AI. Challenges and ethical considerations. AI-driven mobile technologies, virtual assistants (Siri, Google Assistant, Alexa). Adaptive learning, Real-time translation services.
Week 3	**Applications and tools of AI- AI and society- ethical challenges in AI and the future of AI:** Overview of AI applications in various industries: education, healthcare, transportation, marketing, advertising, finance, robotics and automation technologies. How AI affects social. AI and international relations. AI and the future of humanity. AI ethics, privacy and surveillance, the impact of AI on the job market. Future trends in AI, recent research and emerging technologies.
Week 4	**Introduction to Python:** * History, features, applications of Python. * Python installation (Anaconda/VS Code/Jupyter). * Running scripts & interactive mode. * Basic syntax, variables, data types.
Week 5	**Control Structures:** * Conditional statements (if, elif, else). * Loops (for, while). * Loop control (break, continue, pass).
Week 6	**Data Structures I:** * Strings & string methods. * Lists: creation, indexing, slicing, methods.
Week 7	**Mid-term exam**
Week 8	**Data Structures II:** * Tuples, Sets, Dictionaries. * Iteration over data structures.
Week 9	**Functions:** * Defining functions, arguments, return values. * Default arguments, keyword arguments. * Scope and lifetime of variables.
Week 10	**Modules & Packages:** * Importing modules. * Standard library overview (math, random, datetime, os). * Creating and using custom modules.
Week 11	**File Handling:** * Reading and writing text files. * CSV basics. * Exception handling (try, except, finally).
Week 12	**Object-Oriented Programming:** * Classes and objects. * Attributes and methods. * Constructor (__init__). * Inheritance. * Method overriding. * Encapsulation.
Week 13	**Advanced Python Features:** * List comprehensions, lambda functions. * Iterators and generators. * Decorators (basic intro).
Week 14	**Working with Libraries:** * NumPy basics (arrays, operations). Pandas basics (Series, DataFrame). * Matplotlib basics (simple plots).
Week 15	**Python and Databases:** * SQLite with Python. * CRUD operations. * Connecting Python apps to databases.
Week 16	**Final exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Basic network components.
Week 2	AI techniques and approaches.
Week 3	Applications and tools of AI
Week 4	Setup environment, "Hello World", simple expressions.
Week 5	Simple calculators, number guessing game.
Week 6	String formatting, list operations (matrix as list of lists).
Week 7	Mid-term exam
Week 8	Student database using dictionaries.
Week 9	Mini project – math utilities (factorial, prime check, Fibonacci).
Week 10	Build custom math module.
Week 11	Process student grade data from file.
Week 12	Class for student info management. Banking system simulation with base/derived classes.
Week 13	Build custom iterator & use lambda for sorting.
Week 14	Load dataset (CSV), analyze with Pandas, plot with Matplotlib.
Week 15	Simple student database application

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Graham Brown, David Watson, “Cambridge IGCSE Information and Communication Technology”, Third Edition (2020).	
Recommended Texts	Ahmed Banafa, “Introduction to Artificial Intelligence (AI)”, 1st Edition (2024).	
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

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.