MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Science II**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**GE 212**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	Third	
Administering Department	Petroleum Engineering		**College**	College of Engineering	
Module Leader	**Saad Kadhem Majeed**		**e-mail**	saadkm@alnaji-uni.edu.iq	
Module Leader's Acad. Title	**Assist. Prof.**		**Module Leader's Qualification**	PHD	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Computer Science I, GE112	**Semester**	First
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	MATLAB: Starting with MATLAB, Variables, Input and Output, 2-dimensional plot, Matrices, Functions, Polynomials, Polynomial derivative, Curve fitting, Interpolation, Numerical integration, IF statement, Loops.
Module Learning Outcomes	The Computer Science module is designed to equip petroleum engineering students with the essential programming skills and knowledge required to leverage computational

مخرجات التعلم للمادة الدراسية	tools and software for various tasks in the industry. It enables them to develop software solutions, analyze large datasets, and automate repetitive tasks, enhancing their efficiency and productivity in their future careers. Additionally, programming skills are becoming increasingly valuable in the petroleum industry as technology and digitalization play a more significant role in optimizing operations and decision-making processes.
Indicative Contents المحتويات الإرشادية	**Lecture titles** • Understand the reason behind studying Matlab programing language. • Introduction to Matlab • A minimum MATLAB session • Getting started • Mathematical functions • Matrix generation • Basic plotting

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students. * Lectures are conducted by face-to-face education in the classroom, two hours per week, and students' technical reports. * Conducting dialogues and discussions with the request **Methods of assessment for students.** * Quarterly exams. * Discussions and assignments. *The overall assessment for this course is as follows: Annual pursuit of 50 points from the total mark, which includes assignments and oral examinations and quarterly in addition to presentations. *50 marks for the final exam

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	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

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, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	2	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1-3	• Introduction to MATLAB • Basic features • A minimum MATLAB session • Starting MATLAB • Using MATLAB as a calculator • Creating MATLAB variables • Overwriting variable . • Error messages • Making corrections • Mathematical functions • Examples
Week 4,5	• Arrays • Array Terminology • Declarations • Array Conformance • Array Element Ordering • Array Syntax • Whole Array Expressions • Visualizing Array Sections • Array Sections • Printing Arrays • Input of Arrays • Array I/O Example • Array Inquiry Intrinsic • Array Constructors • The RESHAPE Intrinsic Function • Array Constructors in Initialization Statements • Allocatable Arrays • Deallocating Arrays

Week 6-8	• Matrix generation • Entering a vector • Entering a matrix • Matrix indexing • Colon operator • Linear spacing • Colon operator in a matrix • Creating a sub-matrix • Deleting row or column • Dimension • Continuation • Transposing a matrix • Concatenating matrices • Matrix generators • Special matrices • Matrix arithmetic operations • Array arithmetic operations • Solving linear equations • Matrix inverse • Matrix functions
Week 9,11	• Control flow and operators • Introduction • Control flow • The `if...end" structure • Relational and logical operators • The ``for...end" loop • The ``while...end" loop • Other flow structures • Operator precedence • Saving output to a file • Exercises
Week 12,13	• M-File Scripts • Examples • Script side-effects • M-File functions • Anatomy of a M-File function • Input and output arguments • Input to a script file • Output commands

	• Exercises
Week 14,15	• **Basic plotting** • **overview** • **Creating simple plots** • **Adding titles, axis labels, and annotations** • **Multiple data sets in one plot** • **Specifying line styles and colors** • **Exercises**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Curriculum and textbook	Yes
Recommended Texts	[1] D. Houcque, "Introduction To Matlab for Engineering Students," *School of Engineering & Applied Science*, no. August. pp. 1–74, 2005.	No
Websites	https://www.mathworks.com (for learning matlab)	

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.