MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Computer			**Module Delivery**	
Module Type	Basic			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NTU 202				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	RETE		**College**	College of Oil and Gas Techniques Engineering – Kirkuk (COGTEK)	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Computer	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	MATLAB is a widely used programming language and computational tool for numerical analysis, data visualization, and scientific computing. In undergraduate curricula, MATLAB teaching goals include developing students' skills in programming, data analysis, and problem solving, as well as providing them with a practical understanding of mathematical concepts and the analysis of complex computations and algorithms. The most crucial goals for teaching MATLAB include learning outcomes, which include: 1- Introduction to Programming: MATLAB is frequently used in academic curriculum as an introductory programming language. The main goal is to familiarize students with fundamental ideas in programming, including variables, data types, control structures, functions, and algorithms. 2- Numerical Computation: MATLAB is frequently used for numerical computation, and one of the primary objectives of the MATLAB study program is to teach students how to conduct mathematical calculations, work with matrices, solve challenging equations, and put algorithms into practice for scientific, engineering, and mathematical applications. 3- Data Analysis and Visualization: MATLAB offers strong tools for data analysis and visualization. The built-in functions, toolboxes, and simulations of MATLAB are used by students to construct plots and graphs, show data in various forms, and do statistical analysis. 4- Simulation and Modeling: Many simulation and modeling jobs are performed using MATLAB. Students will learn how to create mathematical models, simulate systems, and analyze their behavior by utilizing MATLAB's simulation features. 5- Development of applications: MATLAB enables the creation of standalone programs and GUI-based user interfaces. For their projects and scientific research, students can learn how to write interactive programs, publish MATLAB code as standalone applications, and develop user-friendly interfaces. 6- Development of applications: MATLAB enables the creation of standalone programs and GUI-based user interfaces. For their projects and scientific research, students can learn how to write interactive programs, publish MATLAB code as standalone applications, and develop user-friendly interfaces. 7- Problem-solving abilities are a common topic of MATLAB study programs. Students are encouraged to use their MATLAB and programming expertise to address real-world issues, developing their analytical and critical thinking skills.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	MATLAB is a popular programming language and tool. It has many uses, including biology, engineering, economics, mathematics, data analysis, and complex mathematical equations. As a result, MATLAB learning objectives in undergraduate curricula can change based on the course and level of the student. In academic programs, MATLAB often produces the following learning outcomes: 1- Understanding and Application of Programming Concepts: Students learn the basic structure of the MATLAB programming language, including variables, loops, functions, and conditional statements. They also learn how to write efficient and effective code using best programming practices. 2- Data analysis and visualization using equation solving, engineering diagrams, and visualization are all possible with MATLAB. Students gain knowledge of how to use MATLAB functions to import, modify, and analyze data. In order to visualize outcomes, they also learn how to make plots, charts, and graphs. 3- Modeling and Simulation: MATLAB is often used to model and simulate complex systems in engineering, physics, applied science, and other scientific fields. Students learn how to create mathematical models and simulations using MATLAB functions and tools. 4- Solve complex problems: MATLAB is a useful tool for solving complex problems in many fields. Students learn how to use MATLAB to solve problems related to optimization, numerical analysis, and differential and integral equations in advanced mathematics. 5- Interdisciplinary: MATLAB has applications in a wide range of disciplines, including engineering, physics, biology, economics, and mathematics. Students gain knowledge of how to use MATLAB to tackle issues in their particular fields of study. 6- Programming for scientific computing: MATLAB is often used in scientific computing, where efficient and accurate numerical calculations are required. Students learn how to code scientific computing applications using MATLAB's built-in functions and tools to analyze their data. 7- Algorithm development: MATLAB is a useful tool for developing and testing algorithms. Students learn how to develop and test algorithms for various applications using MATLAB. 8- Digital Image and Signal Processing: MATLAB contains built-in functions for processing digital images and signals, which makes it a popular tool in these fields. Students learn how to use MATLAB to analyze and process images and digital signal processors. 9- Machine Learning and Data Science: MATLAB has a variety of tools for machine learning and data science applications, including neural networks, classification algorithms, and data visualization tools. Students learn how to use these tools to solve problems and analyze data in machine learning.

	10- Communication and Collaboration: MATLAB is frequently used in joint research projects where a large number of researchers contribute to the same code base. The built-in version control and code sharing facilities in MATLAB help students learn how to cooperate productively. Additionally, they gain communication skills by using MATLAB's visualization and simulation tools to present their findings. 11- Control Systems Design: When it comes to planning and assessing control systems, MATLAB is employed in control systems engineering. Students gain knowledge of how to utilize MATLAB to simulate closed-loop systems, create controllers, and assess system stability. 12- Computational finance: MATLAB has built-in functions for financial modeling and analysis, making it a popular tool in computational finance. Students learn how to use MATLAB to model financial markets, analyze financial data, and develop trading strategies. 13- Numerical methods: MATLAB is a powerful tool for numerical methods, such as solving differential equations, performing numerical integration, and solving optimization problems. Students learn how to use MATLAB to apply numerical methods to solve problems in their respective fields of study.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **Part A -** Introduction to MATLAB environment & MATLAB windows, MATLAB commands & elementary mathematical functions **[12 hrs]** Vectors and Matrices **[14 hrs]** Solving basic algebraic equations & quadratic equations **[14 hrs]** Create function in files – MATLAB Introduction to Plotting, Plotting multiple plots & Plotting 3D **[14 hrs]** **Part B-** **For-end** loops, **While- end** loops & **If** statement **[14hrs]** Integration, differentiation and Fourier transform **[12 hrs]** Introduction to Simulink and Modeling equations in Simulink **[14 hrs]** Modeling electrical cct. in Simulink, Modeling electronic and communication cct. in Simulink **[14 hrs]**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Learning and teaching strategies are methods used to help learners acquire knowledge and skills, and for teachers to effectively deliver instruction. There are various types of learning and teaching strategies, including: 1- Active learning entails involving students in tasks that demand their participation, critical thinking, and application of what they have learned. Group discussions, practical exercises, and problem-based learning are a few examples. 2- Collaborative learning: This involves group work and collaboration among learners to achieve a common goal. Examples include group projects and peer learning. 3- Inquiry-based learning: This involves encouraging learners to ask questions, explore topics, and find answers through research and experimentation. Examples and reports include scientific investigations and case studies. 4- Direct instruction: This involves the teacher providing information to learners in a structured and organized manner. Examples include lectures, demonstrations, and tutorials. 5- Differentiated instruction: This involves tailoring instruction to meet the needs of individual learners, based on their learning style, abilities, and interests. 6- Technology-based instruction: This involves using technology tools and resources to enhance instruction and engage learners. Examples include online courses, interactive whiteboards, and educational apps. 7- Effective teaching and learning strategies often involve a combination of these approaches, tailored to the needs of the learners and the content being taught.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**75**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #2, and 11
	Assignments	2	10% (10)	2, 12	LO # 4, and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 8
Summative assessment	**Midterm Exam**	1 hr	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	Introduction to MATLAB environment & MATLAB windows
Week 2	MATLAB commands & elementary mathematical functions
Week 3	Vectors and Matrices
Week 4	Matrices
Week 5	Solving basic algebraic equations & quadratic equations
Week 6	Create function in files - MATLAB
Week 7	Introduction to Plotting, Plotting multiple plots & Plotting 3D
Week 8	Operational & logical Statements
Week 9	**For-end** loops & **While- end** loops
Week 10	**If** statement
Week 11	Integration & differentiation
Week 12	Fourier transform
Week 13	Introduction to Simulink
Week 14	Modeling equations in Simulink
Week 15	Modeling electrical cct. in Simulink
Week 16	Modeling electronic cct. in Simulink

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to MATLAB environment
Week 2	MATLAB windows
Week 3	MATLAB commands & elementary mathematical functions
Week 4	Vectors
Week 5	Matrices
Week 6	Solving basic algebraic equations & quadratic equations
Week 7	Create function in files - MATLAB
Week 8	Introduction to Plotting, Plotting multiple plots & Plotting 3D
Week 9	Operational & logical Statements
Week 10	**For-end** loops & **While- end** loops
Week 11	**If** statement
Week 12	Integration & differentiation
Week 13	Fourier transform
Week 14	Introduction to Simulink and Modeling equations in Simulink
Week 15	Modeling electrical cct. in Simulink
Week 16	Modeling electronic cct in Simulink

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	MATLAB An Introduction with Applications.	
Recommended Texts	An Introduction to Programming and Numerical Methods in MATLAB	
Websites	https://www.mathworks.com	

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.