MODULE DESCRIPTION FORM

Module Information					
Module Title	**MATLAB**			**Module Delivery**	
Module Type	**Supportive**			☒ **Lecture** ☒ **Practical**	
Module Code	**MPH204**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Medical Physics		**College**	College of Science	
Module Leader	Nabil Sadiq Abdul Abbas		**e-mail**	Nabeel.alshreefy@uowa.edu.iq	
Module Leader's Acad. Title	Asst. Lecturer		**Module Leader's Qualification**	MS.c	
Module Tutor	Nabil Sadiq Abdul Abbas		**e-mail**	Nabeel.alshreefy@uowa.edu.iq	
Peer Reviewer Name	Karar Sadiq Mohsen		**e-mail**	karar.sadeq@uowa.edu.iq	
Scientific Committee Approval Date	2024-09-17		**Version Number**	V 1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Department Head Approval

Dean of the College Approval

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	This course aims at: 1- Introducing MATLAB: The lectures aim to familiarize students with the MATLAB software, its interface, basic commands, and programming concepts. 2- Knowing MATLAB Fundamentals: The lectures aim to provide a solid foundation in MATLAB programming, covering topics such as data types, arrays, matrices, operators, functions, and control flow structures. 3- Exploring Data Analysis and Visualization: The lectures aim at enabling students to explore various techniques and tools available in MATLAB for data analysis, manipulation, and visualization. This may include topics such as data importing, filtering, statistics, plotting, and creating graphical representations of data. 4- Enhancing Algorithm Development: The lectures aim to enhance students' skills in algorithm development using MATLAB. This involves understanding and implementing algorithms, problem-solving strategies, and efficient programming techniques. 5- Introducing Numerical Methods: The lectures aim to introduce students to numerical methods and how MATLAB can be used to solve mathematical problems such as solving equations, numerical integration, interpolation, and optimization. 6- Demonstrating Simulations and Modeling: The lectures aim to demonstrate how MATLAB can be used for simulation and modeling purposes. This may include topics like creating mathematical models, simulating physical systems, and analyzing simulation results.
Module Learning Outcomes	The student would be able to: 1- Understand the basics of MATLAB software and its command syntax. 2- Apply MATLAB programming concepts to solve computational problems. 3- Manipulate and analyze data using MATLAB's built-in functions. 4- Develop algorithms and implement numerical methods using MATLAB. 5- Perform basic data visualization using MATLAB's plotting capabilities. 6- Solve mathematical equations and perform mathematical computations using MATLAB. 7- Apply MATLAB for basic simulations and modeling tasks. 8- Apply critical thinking and problem-solving skills to MATLAB projects. 9- Document and present MATLAB projects effectively.
Indicative Contents	Indicative content includes the following: It encompasses topics such as variables and data types, control flow structures, functions and scripts, data import/export, data analysis, plotting and visualization, numerical computations, algorithm development, simulations and modeling, advanced topics (if applicable), problem-solving and application, project work, and documentation/presentation skills. These contents aim to provide students with a comprehensive understanding of MATLAB's capabilities, programming concepts, and practical application in various domains.

Learning and Teaching Strategies

Strategies	**Lectures: Engaging and interactive lectures to introduce new concepts, theories, and problem-solving techniques.** **Hands-on Practice: Active engagement and practical exercises are key to learning computer software effectively.** **Demonstration and Explanation: Instructors demonstrate software features and explain concepts using examples and visuals.** **Step-by-Step Tutorials: Providing clear instructions and visuals helps learners follow along and grasp software functionalities.** **Collaborative Learning: Encouraging collaboration among learners through group projects or peer feedback fosters a supportive learning environment.** **Online Resources and Documentation: Supplementing learning with online resources, official documentation, and forums enhances understanding and troubleshooting.** **Real-World Applications: Relating software learning to real-world scenarios increases student engagement and practical relevance.**

Student Workload (SWL)

Structured SWL (h/sem)	44	**Structured SWL (h/w)**	3.2
Unstructured SWL (h/sem)	78	**Unstructured SWL (h/w)**	5.2
Total SWL (h/sem)	**122 + 3 final = 125**		

Module Evaluation

		Time / Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	15% (5)	4,11	2,6
	Projects	1	5% (5)	13	6,7,9
	Online Assig.	5	15% (3)	3,5,7,9,12	3,4,5,8,9
	Reports	1	5% (5)	6	1,2,4,6
Summative assessment	**Midterm Exam**	1 hr.	10% (10)	7	1 – 7
	Final Exam	3 hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	The MATLAB System, Installation, User Interface.
Week 2	Desktop Tools and Development Environment, Mathematical Function Library, The Language, Graphics, External Interfaces, Lab participation.
Week 3	Expressions, Commands, Formats, Symbolic Computation H.W_1
Week 4	Operator Precedence, MATLAB Fundamentals.
Week 5	Script File, Comments.
Week 6	Lab Participation, Programming.
Week 7	Help Menu, Constructing Symbolic Objects.
Week 8	Mid-Term Exam, Pretty Command,
Week 9	Sin, Cos, Tan, Cot, Sec, Csc Commands.
Week 10	Function M-Files, Data Import-Export, H.W_2, Programming.
Week 11	Vectors Create and Given Size and Plot, Solving Equations.
Week 12	Factorial Command, Sort Command.
Week 13	Matrices, Loops, Matlab Graphics, Solving Equations.
Week 14	Review and Assessment.
Week 15	Final Exam

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	1- Brian D. Hahn and Daniel T. Valentine, Essential MATLAB for Engineers and Scientists, 7th Edition, Elsevier, London 2019.Stormy Attaway, MATLAB, 2016, United States	Yes
Recommended Texts	1- Rudra Pratap, Getting Started with MATLAB, 2010, United States 2- Duane Hanselman and Bruce Littlefield, Mastering MATLAB, 2019, United States	Yes
Websites	https://www.mathworks.com/help/ https://www.mathworks.com/matlabcentral/answers/ https://www.mathworks.com/products/matlab-online.html https://octave-online.net/	

Grading Scheme

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.