



Course Specification

— (Bachelor)

Course Title:	Computer Applications in Medical Physics
Course Code:	MPHY26444
Program:	Medical Physics
Department:	Physics
College:	Sciences
Institution:	University of Bisha
Version:	1
Last Revision Date:	5 September 2023



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A. General information about the course:

1. Course Identification

1. Credit hours: 3 (2 Lectures + 1 Laboratory)

2. Course type

A. University College Department Track Others

B. Required Elective

3. Level/year at which this course is offered: 3th Level / 2nd year

4. Course general Description

This course acquisition of basic knowledge in programming numerical methods by using MATLAB.

5. Pre-requirements for this course (if any):

NA

6. Co- requirements for this course (if any):

NA

7. Course Main Objective(s)

Recognize the solutions of physics problems using MATLAB.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	4	100%
2.	E-learning		
3.	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4.	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	





4.	Tutorial	
5.	Others (specify)	
	Total	60





B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Recognizing Fundamentals of programming.	K.2	Lecturing	Quizzes Homework Midterm exam Final exam
1.2	Recognizing the numerical solutions of physics problems Using MATLAB.	K.2	Lecturing	
2.0	Skills			
2.1	Write programs for numerical methods by MATLAB	S.4	Practices lab	Quizzes Homework Midterm exam Final exam
2.2	Plot 2D and 3D data by using MATLAB.	S.4	Practices lab	
2.3	Communicate positively with others.	S.3	Presentation Work group	Reports Presentation
3.0	Values, autonomy, and responsibility			
3.2	Participate in the development of team performance.	V.3	Work group	Reports Presentation

C. Course Content

No	List of Topics	Contact Hours
1.	Fundamentals of Programming 1. Algorithms	٦
2.	Fundamentals of Programming 2. Flowcharts Examples	٦
3.	An Introduction to MATLAB 1. Basic Commands in MATLAB 2. Vectors and Matrices operations	٦
4.	An Introduction to MATLAB 3. MATLAB Graphics	٦



	Loops	
5.	Solutions of linear and nonlinear equations Using MATLAB 1. Elementary Row Operations 2. Gaussian Elimination Method 3. Iterative Methods	٦
6.	Solutions of linear and nonlinear equations Using MATLAB 4. Newton's Method 5. Broyden's Method for Solving Nonlinear Equations	٦
7.	Differentiation and Integration 1. Numerical Differentiation and Integration	٦
8.	Differentiation and Integration 2. Simpson's Rule 3. Newton–Cotes Formulae	٦
9.	Solution of physics problems 1. Simulink 2. Electronic Circuits	٦
10.	Solution of physics problems 3. Radioactivity 4. Kirchhoff's Rules	٦
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework, quizzes, reports, and presentation.	1: 10	5 %
2.	Achievement file (Practical experience reports).	1: 10	5 %
3.	First term exam	7: 8	10 %
4.	Second term exam	12:13	10 %
5.	Practical exam	15	20 %
6.	Final exam	End of Semester	50 %

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	G.R. Lindfield and J.E.T. Penny, Numerical Methods Using MATLAB, Elsevier, 2012.
Supportive References	MATLAB toolbox, https://www.mathworks.com/
Electronic Materials	- Blackboard. - PowerPoint presentations.



	- Digital library of University of Bisha https://ub.deepknowledge.io/Bisha
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	NA
Technology equipment (projector, smart board, software)	Projector or smart board
Other equipment (depending on the nature of the specialty)	NA

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Extent of achievement of course learning outcomes.	Teachers, students.	Direct (Final exams), Indirect (Questionnaire).
Effectiveness of teaching.	Teachers, students.	Indirect (Questionnaire)
Effectiveness of assessment.	Teachers, students.	Indirect (Questionnaire)
Quality of learning resources	Teachers, students.	Indirect (Questionnaire)
Quality of facilities available	Teachers, students.	Indirect (Questionnaire)
Fairness of evaluation	Peer reviewer.	Direct (Final exams reevaluation).

G. Specification Approval Data

COUNCIL /COMMITTEE	College of Science Council
REFERENCE NO.	1
DATE	5 September 2023

