هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAAA
2024
TP-153

Course Specification
(Bachelor)

Course Title:	**Math Software**
Course Code:	**MAT 1244**
Program:	**Bachelor of Science in Actuarial and Financial Mathematics**
Department:	**Mathematics and Statistics**
College:	**Science**
Institution:	**Imam Mohammad Ibn Saud Islamic University**
Version:	**2024 - V1**
Last Revision Date:	**None**

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A. General information about the course:

1. Course Identification

1. Credit hours:					
3 (1 Lectures, 2 Lab, 2 Tutorial)					
2. Course type					
A.	☐University	☐ College	☒ Program	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: Level 2 / Year 1					
4. Course general Description:					
This course describes the most important ideas, theoretical results, and examples for an introduction to MATLAB programming. The emphasis is on calculations and programming.					
5. Pre-requirements for this course (if any)**:**					
None					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
• **To provide an introduction and use some of the high-level mathematical programming languages such MATLAB, Maple and Mathematica, as a practical aid in doing mathematics.** • **To provide the student with some basic skills in the use of this software without attempting deep coverage.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	**75**	**100%**
2	E-learning	**0**	**0%**
3	Hybrid • Traditional classroom • E-learning	**0**	**0%**
4	Distance learning	**0**	**0%**

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	15
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	30
5.	**Others (specify)**	0
Total		**75**

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	Identify the environment of software "MATLAB".	K2	▪ 1 lecture hours\week ▪ 2 lab hours\week ▪ Self-study	Direct: ▪ Lab Exams ▪ Assignments ▪ Short Quizzes
1.2	Recall a range of syntaxes using MATLAB.	K3		
2.0	**Skills**			
2.1	Create code to provide a solution to a range of Mathematical problems ranging from simple to complex.	S1	▪ Self-study ▪ Real-life problems	Direct: Participations, Short Quizzes
2.2	Produce and implement, clearly and precisely, simple programs.	S3		
2.3	Develop MATLAB code into a given to online solver.	S1		
2.4	Analyze algorithms, M-file script and calculus operation design to solve mathematical problems via MATLAB.	S3	▪ Self-study ▪ Real-life problems	Direct: Participations, Short Quizzes
3.0	**Values, autonomy, and responsibility**			
3.1	Generate initiatives with independence and in groups.	V1	Personal questions	Direct: Participation
3.2	Show attitude of support the use of mathematical software in solving real life problems.	V1	Teamwork	Direct: Homework and Mini projects

C. Course Content

No	List of Topics	Contact Hours
1	Starting with MATLAB: Introduction to the software and computer, MATLAB windows, help and look for commands, arithmetic operations, Display Formats, Built-in functions, Variables assignment, Elementary built-in functions, Command line editing.	5
2	Arrays: Creating arrays (vectors, matrices), Lin space command, some major matrices, operators, Matrix operations in MATLAB, Array addressing, Adding and deleting elements, Strings.	10

3	Other Operators: Operator Precedence, Relational operations, Logical operations, all and any commands, find command, sort command, max and min command.	10
4	2D and 3D graphs: Plot and ezplot command, fplot command, multigraphs plots, others plot commands, axis and graphic handling, layout a figure, 3D line plot, Mesh and Surface plots, view command.	10
5	Script files: Creating and saving a file, disp and fprintf commands, loading a file, search path, defining functions, structure of a function file, inline function, feval command, local and global variables, …	10
6	Starting with MATLAB: Introduction to the software, Command window, help and look for commands, arithmetic operations, Display Formats, Built-in functions, Variables assignment, Command line editing.	10
7	Programming: If-else structure, for and while loops, Break and continue commands, Switch-case statement.	10
8	Symbolic toolbox: Symbolic object and expressions, algebraic expression manipulation, factorization, simplification, solving equations.	10
Total		75

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	HomeWorks, Quizzes, Mini projects	During the term	10%
2.	First Midterm	Week 5-6	25%
3.	Second Midterm	Week 10-11	25%
4.	Final Exam	Week 16	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	▪ ***Introduction to MATLAB***, Delores Etter, Pearson Education Inc, 4th Edition, 2018. **ISBN: 978-0-13-461528-8 (Main Reference)**
Supportive References	▪ ***MATLAB: An Introduction with Applications,*** 3rd Edition; Amos Gilat, The Ohio State Univ. 2008. ▪ ***MATLAB Primer,*** 7th Edition, K. Sigmon and T. Davis, Chapman & Hall/CRC, 2005.
Electronic Materials	MATLAB online documentation (http://www.mathworks.com)
Other Learning Materials	**None**

2. Required Facilities and equipment

Items	Resources
facilities	▪ Each classroom should be equipped with a whiteboard and a projector.

Items	Resources
(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	▪ Laboratories should be equipped with computers and an internet connection.
Technology equipment (projector, smart board, software)	▪ The rooms should be equipped with data show and Smart Board.
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**During the semester and at the end of the course each student will complete two evaluation forms.**
Effectiveness of Students' assessment	**Instructor**	**At the end of each semester the course instructor should complete the course report, including a summary of student questionnaire responses appraising progress and identifying changes that need to be made if necessary.**
Quality of learning resources	**Students**	**During the semester and at the end of the course each student will complete two evaluation forms.**
The extent to which CLOs have been achieved	**Instructor**	**At the end of each semester the course instructor should complete the course report, including a summary of student questionnaire responses appraising progress and identifying changes that need to be made if necessary.**
Other	**None**	

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**MATHEMATICS AND STATISTICS DEPARTMENT COUNCIL**
REFERENCE NO.	**8/1446**
DATE	**05/04/1446 (08/10/2024)**