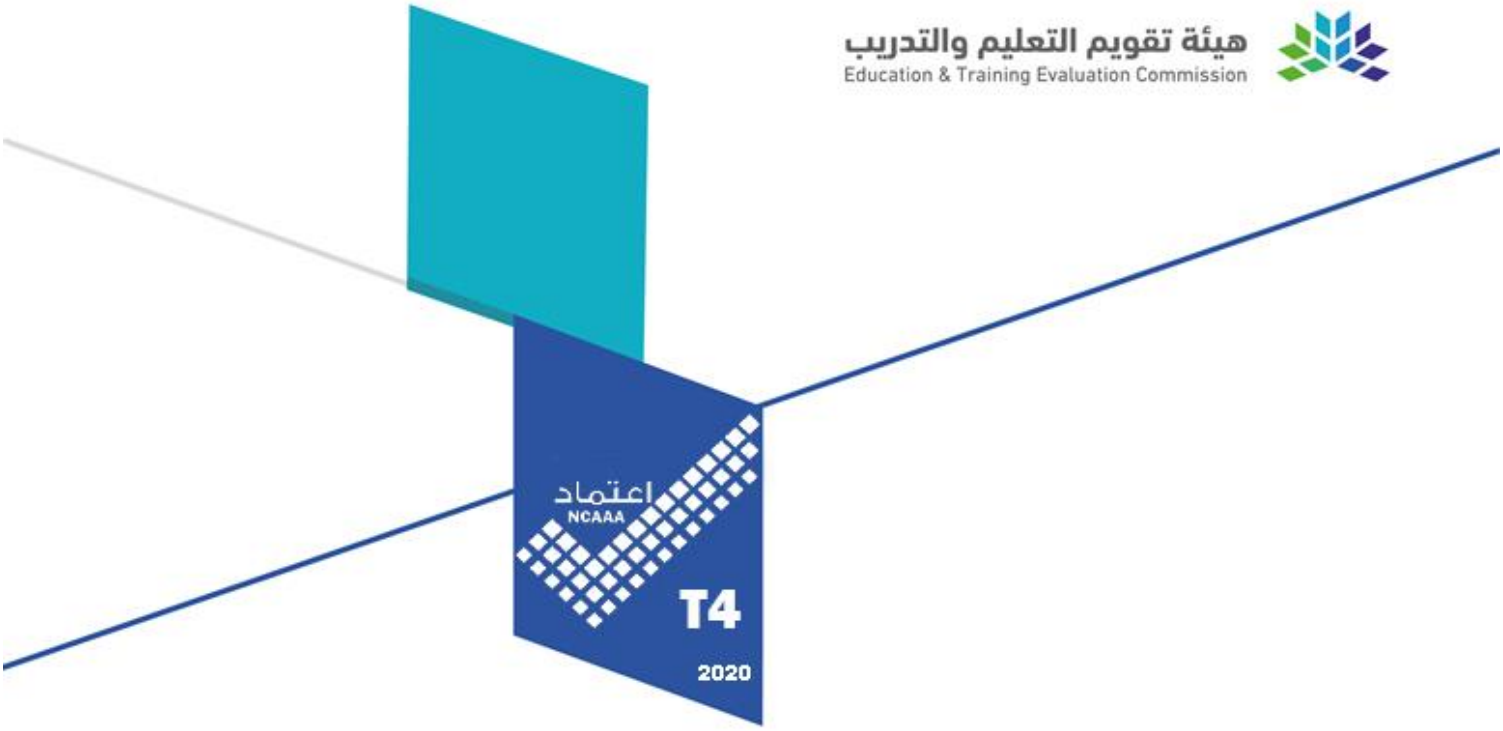
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Mathematical Applications in Computer
Course Code:	MTH 353
Program:	B.Sc in Mathematics
Department:	Mathematics Department
College:	College of Science
Institution:	Majmaah University

Table of Contents

A. Course Identification

1. Credit hours: **3 (2 + 1)**
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: 5th level / third year
4. Pre-requisites for this course (if any)**:** MTH 203 + MTH 251
5. Co-requisites for this course (if any)**:** N/A

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	16	36 %
2	**Blended**	22	49 %
3	**E-learning**	7	15 %
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	16
2	**Laboratory/Studio**	18
3	**Tutorial**	8
4	**Others** (specify)	3
	Total	45

B. Course Objectives and Learning Outcomes

1. Course Description

This course covers the skills of doing mathematical operations such as arithmetic, geometry, statistics, calculus and graphing techniques by computer software.
We use MATHEMATICA, MATLAB and MAPLE as mathematical engines, and using SCEINTIFIC WORKPALCE as editing and scientific designing software.

2. Course Main Objective

This course aims to Study of the basic skills of systems of doing mathematics by computer and basic skills of scientific presentation as follows:
The principles of the use of mathematical programs MATLAB and MATHEMATICA for mathematical calculations and programming for calculus and linear algebra.
The use of the Internet for scientific research and the basics of writing reports and scientific research using scientific workplace, and presentation skills.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2	The students should be able to Use mathematical software (MATHEMATICA – MATLAB – MAPLE) in doing mathematical operations such as arithmetic, geometry, statistics, calculus and graphing techniques.	K2
1.3		
1...		
2	**Skills :**	
2.1		
2.2		
2.3	The students should be able to manipulate mathematical problems practically by learning how to use the computer and the installed package of mathematical software.	S3
2...		
3	**Values:**	
3.1		
3.2		
3.3	The students should be able to Critically interpret numerical and graphical data, which he shall plot by the package of mathematical software. And write treatise or thesis by Scientific workplace.	C3
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to MATHEMATICA with mathematical applications	9
2	Using MATHEMATICA engine in calculus operations (Limits – differentiation – integration – solving ODEs).	9
3	Using MATLAB in graphing applications (plotting functions in 2 and 3D- plotting functions with contour graphs- plotting parametric curves of functions).	9
4	Using MATLAB for linear algebra (matrices and its operations – determinants – systems of equations – eigenvalues and eigenfunctions).	9
5	Editing scientific researches using scientific workplace and learning the presentation skills.	9
...		
Total		45

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1			
1.2	The students should be able to use mathematical software: (MATHEMATICA – MATLAB – MAPLE) in doing mathematical operations such as arithmetic, geometry, statistics, calculus and graphing techniques.	**Direct teaching**: Inquiry-based instruction PowerPoints Discussions **Aimed teaching**: Discovery Oral questions **Indirect teaching**: Peer Learning	Homework Quiz Midterms Final Exams E-exam Oral Exam
…			
2.0	**Skills**		
2.1			
2.2			
2.3	The students should be able to manipulate mathematical problems practically by learning how to use the computer and the installed package of mathematical software.	**Direct teaching**: Lectures **Aimed teaching**: Discovery Oral questions **Indirect teaching**: Peer Learning	Homework Quiz Midterms Final Exams E-exam Oral Exam
…			
3.0	**Values**		
3.1			
3.2			
3.3	The students should be able to critically interpret numerical and graphical data, which he shall plot by the package of mathematical software and write treatise or thesis by SCIENTIFIC WORKPLACE.	**Direct teaching**: Lectures **Aimed teaching**: Discovery Oral questions **Indirect teaching**: Cooperative Learning	Homework Quiz Midterms Final Exams
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm 1	7th week	20 %
2	Midterm 2	12th week	20 %
3	HomeWorks	Through of semester	10 %
4	Quizzes	Through of semester	5%
5	Electronic Exam	13th week	5 %
6	Final exam	End of semester	40 %
7			
8			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

1- 4-office hours per week in the lecturer schedule:

Sunday 12-2 & Tuesday 12-2.

2- The contact with students by e-mail and website.

3- Activation of the virtual classrooms and academic guidance via Black Board **LMS**.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	MATLAB an introduction with applications (by Amos Gilat).
	The MATHEMATICA book (By Stephen Wolfram**).**
Essential References Materials	Numerical Computing with MATLAB (by Cleve Moler's).
Electronic Materials	http://www.wolfram.com/ http://www.mathworks.com/ http://www.mackichan.com/
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom with capacity of 30-students. Computer Lab of Mathematics Department.
Technology Resources (AV, data show, Smart Board, software, etc.)	Mathematical software packages like: 1- MATHEMATICA. 2- MATLAB. 3- MAPLE. SCIENTIFIC WORKPLACE.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	http://mathworld.wolfram.com/classroom/

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students/ internal committee	Direct (Students evaluation electronically organized by Deanship of registration and admission)/ Verification of students' papers
Extent of achievement of course learning outcomes	Staff members (Peer Reviewer)	Indirect (Frequent meetings consultation among the teaching staffs)
Quality of learning resources.	Staff members (course coordinators)	Direct (Meeting between course coordinators and the tutors)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Mathematics Department
Reference No.	27
Date	8/8/1442 H-21/3/2021 G

Head of Department

Dr. Muqrin Almuqrin