



T-104  
2022

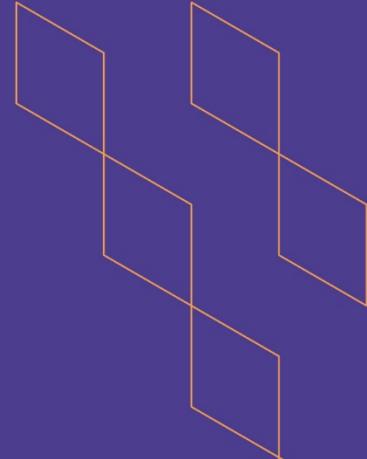
# Course Specification





T-104  
2022

## Course Specification



Course Title:	<b>Mathematical Software</b>
Course Code:	<b>314Math-3</b>
Program:	<b>B.Sc. of Mathematics</b>
Department:	<b>Mathematics</b>
College:	<b>Art and Science</b>
Institution:	<b>Najran University</b>
Version:	<b>2022</b>
Last Revision Date:	<b>12-09-2023</b>



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## A. General information about the course:

Course Identification	
1. Credit hours:	3
2. Course type	
a. University <input type="checkbox"/>	College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Track <input type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>
3. Level/year at which this course is offered:	6/3
4. Course general Description	
<p>This course introduces mathematical software (one of these Maple, Mathematica or Matlab) and its applications to the solutions of mathematical problems in Calculus, Algebra and differential equations. Solution of some numerical problems is also covered as an introduction for numerical analysis courses.</p>	
5. Pre-requirements for this course (if any):	
None	
6. Co- requirements for this course (if any):	
None	
7. Course Main Objective(s)	
<p>The main objective of this course is to solve problems in different subjects of mathematics using mathematical software</p>	

### 1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	2	
2.	E-learning		
3.	Hybrid <ul style="list-style-type: none"> <li>• Traditional classroom</li> <li>• E-learning</li> </ul>		
4.	Distance learning		
5.	Other (Lab)	2	

### 2. 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	Define the fundamental notations of mathematical software	K1	Lectures discussions	Theoretical exam Assignments
2.0	Skills			
2.1	Design the algorithms and its flowchart to solve several mathematical problems.	S5	Lectures Discussions  Solve problem  Practical Lectures	Practical exam Theoretical exam Assignments
2.2	Write simple codes using conditional statements (if, then, else), for/do loops and while constructions.			
2.3	Use built-in commands and functions in Mathematical software to solve several types of problems in Calculus, linear algebra and differential.			
3.0	Values, autonomy, and responsibility			
3.1	Work within groups and independently.	V1	Assignments	Observation card Oral test

### C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Mathematical software (MAPLE, MATHEMATICA or MATLAB)	8
2.	Introduction of Algorithms and the flowchart	10
3.	Introduction to programming: Variables, Operators, expressions, and output.,	10
4.	Conditional statements (IF-Then and ELSE-IF). Repetition statements (for/do loops and while constructions), subroutine function (procedure).	8
5.	Write several programs by the coding in the mathematical Software.	12
6.	Solving problems in different subjects of Mathematics using	12



Mathematical Software.	
<b>Total</b>	<b>60</b>

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam(Theoretical)	10	15
2.	Midterm Exam(Practical)	10	15
3.	Assignments & Quizzes	During classes	10
4.	Final Exam (Practical)	15	20
5.	Final Exam (Theoretical)	16 - 18	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	<ol style="list-style-type: none"> <li>1. Meade et al., Getting started with Maple, Wiley; 3rd edition. 2009.</li> <li>2. Hahn, B.D. and Valentine, D.T.; Essential Matlab for Engineers and Scientists. Elsevier Ltd,2007.</li> <li>3. Martha L. Abell and James P. Braselton .Mathematica by Example.; 3rd edition. 2009</li> </ol>
Supportive References	<ol style="list-style-type: none"> <li>1. B. W. Char. Maple learning gide.Maplesoft, a division of Waterloo Maple Inc. 2003.</li> <li>2. Stormy Attaway.Matlab: A Practical Introduction to Programming and Problem Solving.2009.</li> <li>3. Paul R.Wellin, Richard J. Gaylord, Samuel N. Kamin. An Introduction to ProgrammingwithMathematica,</li> </ol>
Electronic Materials	<ol style="list-style-type: none"> <li>1- <a href="https://www.maplesoft.com/">https://www.maplesoft.com/</a></li> <li>2- <a href="https://mustafasadiq0.com/2014/10/12/-كل-شيء-عن-البرمجة-matlab-program/-">https://mustafasadiq0.com/2014/10/12/-كل-شيء-عن-البرمجة-matlab-program/-</a></li> <li>3- <a href="http://www.wolfram.com/mathematica/">http://www.wolfram.com/mathematica/</a></li> </ol>

### 2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lab include 20 computers.



Items	Resources
Technology equipment (projector, smart board, software)	Data show - Smart Board Maple software - Matlab software Mathematica software Printer Wi-Fi
Other equipment (depending on the nature of the specialty)	None

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Student Questionnaire (Indirect)
Effectiveness of students assessment	Peer Reviewer	Rubrics (Indirect)
Quality of learning resources		
The extent to which CLOs have been achieved	Faculty	Direct
Other		

**Assessor** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods**(Direct, Indirect)

## G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

