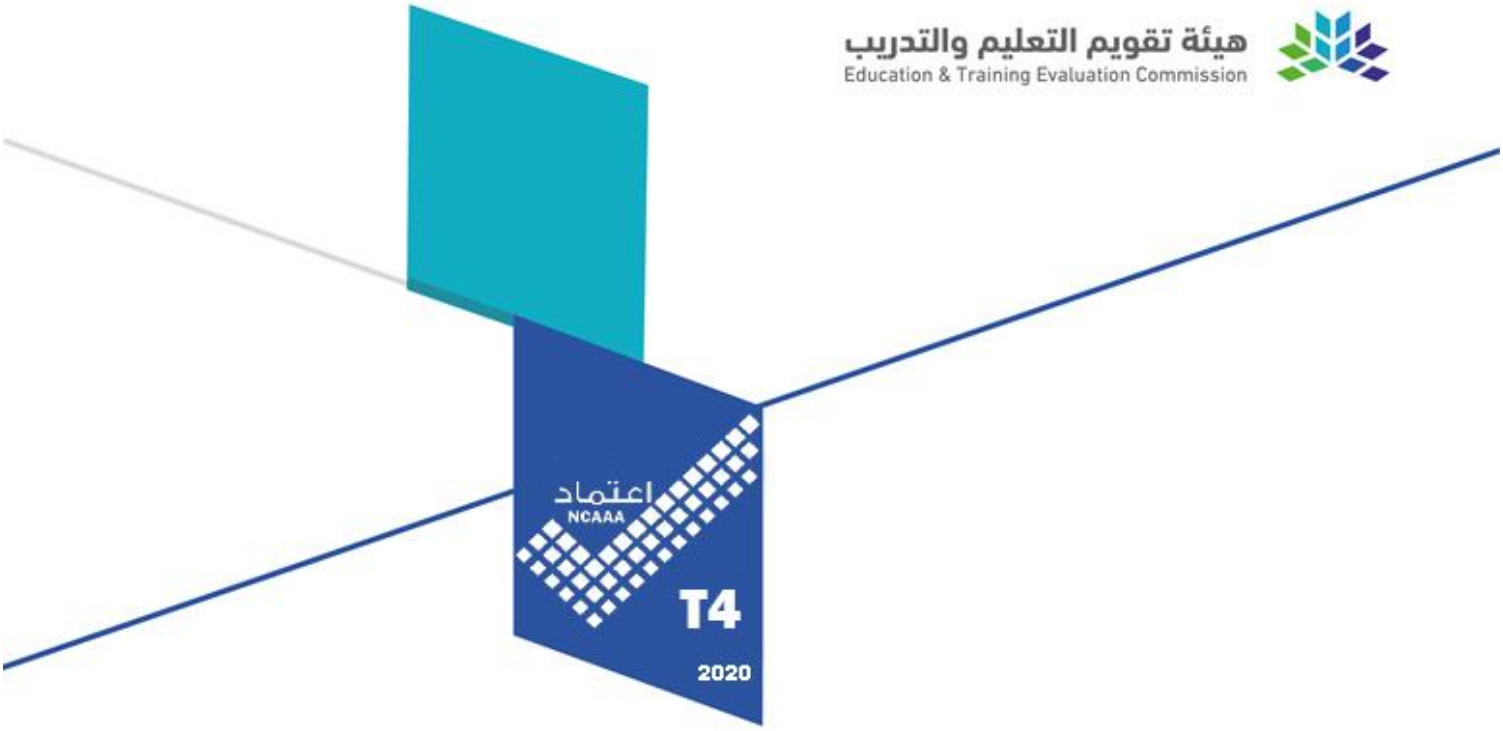
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Scientific Computing
Course Code:	**501125-2**
Program:	**Bachelor in Computer Science**
Department:	**Department of Computer Science**
College:	**College of Computers and Information Technology**
Institution:	**Taif University**

Table of Contents

A. Course Identification

1. Credit hours:
2. Course type **a.** University ☐ College ☒ Department ☐ Others ☐ **b.** Required ☒ Elective ☐
3. Level/year at which this course is offered: Level 2nd/1st year
4. Pre-requisites for this course (if any)**:**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**		
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other (Laboratory/Studio)**	6	100%

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	30
3	**Tutorial**	0
4	**Others** (specify)	0
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description The course introduces the practical aspects of scientific computing where students will be exposed to fundamental coding elements and concepts to solve a wide range of computing and engineering problems.
2. Course Main Objective This course introduces the student to the science of computations. Topics cover algorithms for standard problems in computational science, as well as the basics of scientific programming, to facilitate the student's implementation of algorithms.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Understand scientific programming environment and solve simple mathematical problems using a computer program.	K1
2	**Skills :**	
2.1	Use common built-in mathematical functions in a computer program.	S1
2.2	Create two/three- dimensional plots.	S1
2.3	Create user-defined functions with user-controlled input and output.	S1
2.4	Apply selection and repetition structures to solve real problem.	S1
2.5	Apply the basic operations of matrix to solve a set of equations in linear algebra on a computer.	S1
3	**Values:**	

C. Course Content

No	List of Topics	Contact Hours
1	About MATLAB	5
2	MATLAB Environment	5
3	Built-in MATLAB Functions	5
4	Manipulating MATLAB Matrices	5
5	Plotting	5
6	User-defined Functions	10
7	User-controlled Input and Output	5
8	Logical Functions and Selection Structure	5
9	Repetition Structures	10
10	Matrix Algebra	5
Total		60

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	Understand scientific programming environment and solve simple mathematical problems using a computer program.	Lectures Labs	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey
2.0	**Skills**		
2.1	Use common built-in mathematical functions in a computer program.	Lectures Labs	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.2	Create two/three- dimensional plots	Lectures Labs	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey
2.3	Create user-defined functions with user-controlled input and output	Lectures Labs	**Direct Assessment Tool** Lab Exams **Indirect Assessment Tool** Course Exit Survey
2.4	Apply selection and repetition structures to solve real problem	Lectures Labs	**Direct Assessment Tool** Lab Exams **Indirect Assessment Tool** Course Exit Survey
2.5	Apply the basic operations of matrix to solve a set of equations in linear algebra on a computer.	Lectures Labs	**Direct Assessment Tool** Lab Exams **Indirect Assessment Tool** Course Exit Survey
3.0	**Values**		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	HomeWorks /Student Participation-Attendance	Every Week	10%
2	Quizzes	Week 3 and 7	10%
3	Mid-Term	Week 5	20%
4	Final Labs Exam	Week 8	15%
5	Final Examination	Week 12	45%

***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:

- 6 hours per week in pre-determined office hours
- Consultation by appointment (as needed)
- Through emails
- Through Blackboard Learn

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	MATLAB for Engineers (5th Edition), Holly Moore, ISBN-13: 978-0134589640
Essential References Materials	Getting Started with MATLAB: A Quick Introduction for Scientists and Engineers, Rudra Pratap, ISBN-13: 978-0190602062.
Electronic Materials	Learn with MATLAB. https://www.mathworks.com/support/learn-with-matlab-tutorials.html. Online edition.
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• Classroom with 30 chairs • Lab with 15 PCs and required software tools installed (Ubuntu or Red Hat Linux)
Technology Resources (AV, data show, Smart Board, software, etc.)	• Video projector / data show • White board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching	• Students • Faculty members • Coordinator • Council • Curriculum Committees	• Course exit survey • Feedback from Faculty members • Feedback from Course Coordinator • Feedback from council • Feedback from Curriculum Committees
Effectiveness of assessment	• Students • Faculty members • Coordinator • Council • Curriculum Committees	• Course exit survey • Feedback from Faculty members • Feedback from Course Coordinator • Feedback from council • Feedback from Curriculum Committees
Extent of course achievement	• Students • Faculty members • Coordinator • Council • Curriculum Committees	• Course exit survey • Feedback from Faculty members • Feedback from Course Coordinator • Feedback from council • Feedback from Curriculum Committees
Extent of course learning outcomes	• Students • Faculty members • Coordinator • Council • Curriculum Committees	• Course exit survey • Feedback from Faculty members • Feedback from Course Coordinator • Feedback from council • Feedback from Curriculum Committees

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Quality of learning resources	• Students • Faculty members • Coordinator • Council • Curriculum Committees	• Course exit survey • Feedback from Faculty members • Feedback from Course Coordinator • Feedback from council • Feedback from Curriculum Committees

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	CS Council
Reference No.	Meeting #12
Date	23-10-1443