



## Course Specifications

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

## Table of Contents

<b>A. Course Identification</b> .....	<b>3</b>
6. Mode of Instruction (mark all that apply) .....	3
<b>B. Course Objectives and Learning Outcomes</b> .....	<b>3</b>
1. Course Description .....	3
2. Course Main Objective.....	3
3. Course Learning Outcomes .....	3
<b>C. Course Content</b> .....	<b>4</b>
<b>D. Teaching and Assessment</b> .....	<b>4</b>
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods .....	4
2. Assessment Tasks for Students .....	4
<b>E. Student Academic Counseling and Support</b> .....	<b>5</b>
<b>F. Learning Resources and Facilities</b> .....	<b>5</b>
1. Learning Resources .....	5
2. Facilities Required.....	5
<b>G. Course Quality Evaluation</b> .....	<b>6</b>
<b>H. Specification Approval Data</b> .....	<b>6</b>

## A. Course Identification

<b>1. Credit hours:</b> 2
<b>2. Course type</b> a. University <input type="checkbox"/> College <input checked="" type="checkbox"/> Department <input type="checkbox"/> Others <input type="checkbox"/> b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> 1/1
<b>4. Pre-requisites for this course (if any):</b> NON
<b>5. Co-requisites for this course (if any):</b> NON

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	4	100%
2	Blended	0	0
3	E-learning	0	0
4	Distance learning	0	0
5	Other	0	0

### 7. Contact Hours (based on academic semester)

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

## B. Course Objectives and Learning Outcomes

<b>1. Course Description</b> Main concepts and ideas of scientific computing will be presented in this course. The course consists of two parts, a theoretical and a practical one. the theoretical part presents mathematical methods and algorithms concerning elementary problems in numerical analysis. The practical part helps the students to implement mathematical methods and algorithms									
<b>2. Course Main Objective</b> To enhance the students' mathematical knowledge, to learn programming, To solve mathematical problems numerically and to visualize simulation results graphically									
<b>3. Course Learning Outcomes</b>									
<table border="1"><thead><tr><th></th><th>CLOs</th><th>Aligned PLOs</th></tr></thead><tbody><tr><td>1</td><td>Knowledge and Understanding</td><td></td></tr><tr><td>2</td><td>Skills :</td><td></td></tr></tbody></table>		CLOs	Aligned PLOs	1	Knowledge and Understanding		2	Skills :	
	CLOs	Aligned PLOs							
1	Knowledge and Understanding								
2	Skills :								

CLOs		Aligned PLOs
2.1	Use MATLAB as Interactive Calculator	S1
2.2	Write complete M files including functions	S1
2.3	Apply MATLAB commands and scripts to solve mathematical problems	S1
2.4	Use MATLAB commands to represent Functions in 2D plots and 3D-Plots	S1
<b>3</b>	<b>Values:</b>	

## C. Course Content

No	List of Topics	Contact Hours
1	What is MATLAB?	6
2	Matrices and Vectors, Matrix and Array Operations	6
3	Character strings, Command- Line Functions	6
4	Using Built-in Functions and On-line Help, Saving and Loading Data	6
5	Plotting Simple Graphs	6
6	Programming in MATLAB: Scripts and Functions, Script Files	6
7	Advanced Data Objects, Publishing Reports, Curve Fitting and Interpolation Applications	6
8	Mathematical Applications	6
9	Basic 2-D Plots, 3-D Plots	6
10	3-D Surface Graphics, Saving and Printing Graphs	6
<b>Total</b>		<b>60</b>

## D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and Understanding</b>		
<b>2.0</b>	<b>Skills</b>		
2.1	Use MATLAB as Interactive Calculator	Lecture Problem Solving	Written Exams Quizzes
2.2	Write complete M files including functions	Lecture Problem Solving	Written Exams Quizzes
2.3	Apply MATLAB commands and scripts to solve mathematical problems	Lecture Problem Solving	Written Exams Quizzes
2.4	Use MATLAB commands to represent Functions in 2D plots and 3D-Plots	Lecture Problem Solving	Written Exams Quizzes
<b>3.0</b>	<b>Values</b>		

### 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Continues	20%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
2	Midterm Exam	7	30%
3	Final Exam	16	50%

\*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 :

Academic advising and counseling of students is an important component of teaching; student academic advising is a mandatory requirement of College of Computers and Information Technology (CCIT). Appropriate student advising provides support needed for the student during times of difficulty. In addition, it helps the student to build a close relationship with his/her advisor and to provide student motivation and involvement with the institution.

In addition, since faculty are usually the first to recognize that a student is having difficulty, faculty members play a key role in developing solutions for the students or referring them to appropriate services. Faculty members also participate in the formal student-mentoring program.

Additional counseling is provided by course directors, who provide students with academic reinforcement and assistance and refer “at risk” students to the Vice Dean for Academic Affairs and the Vice Dean for female section.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	RUDRA PRATAP, Getting Started with MATLAB, OXFORD UNIVERSITY PRESS, 2010
<b>Essential References Materials</b>	HOLLY MOORE, MATLAB for Engineers, Pearson Education, Inc., 2012.
<b>Electronic Materials</b>	NON
<b>Other Learning Materials</b>	NON

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> <li>A Lecture room appropriate for maximum 25 students with a personal computer, a data show and a smart board.</li> </ul>

Item	Resources
	<ul style="list-style-type: none"> <li>A Lab room appropriate for maximum 15 students with a personal computer, a data show and a smart board.</li> </ul>
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> <li>Lab materials and required software</li> </ul>
<b>Other Resources</b> (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	Students surveys and Students course evaluation
Improvement of Teaching	Course Coordinator	deficiencies based on the student Evaluation, faculty input, course file, and program assessment
Verifying Standards of Student Achievement	Curriculum Committee	<ul style="list-style-type: none"> <li>Review CAF (Course assessment file)</li> <li>Alumni surveys.</li> </ul> Periodic exchange and remarking of tests or a sample of assignments with staff at another

**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	
Reference No.	
Date	