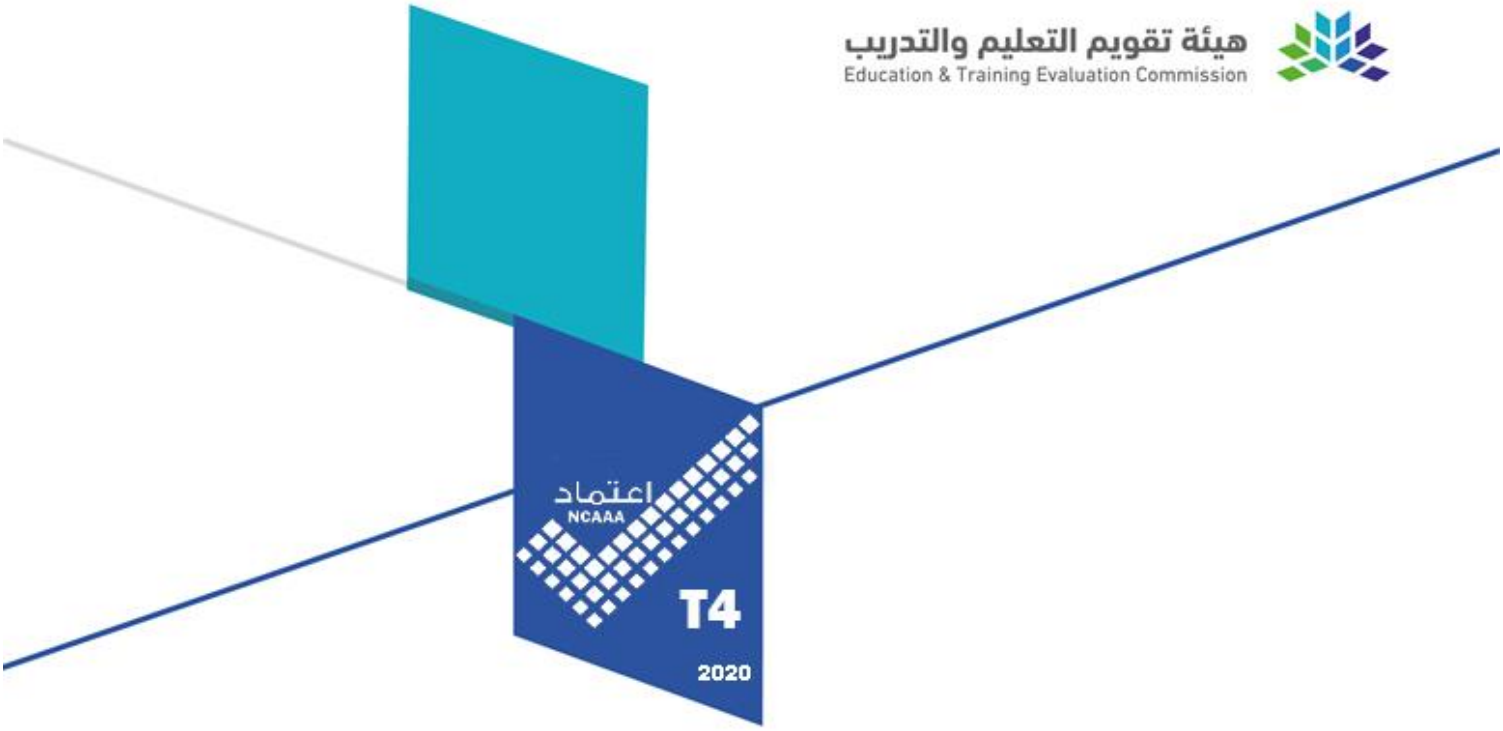
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Microprocessors
Course Code:	503431-3
Program:	Bachelor in Computer Engineering
Department:	Department of Computer Engineering
College:	The College of Computers and Information Technology
Institution:	Taif University

Table of Contents

A. Course Identification

1. Credit hours: 3 hours
2. Course type **a.** University ☐ College ☐ Department ■ Others ☐ **b.** Required ■ Elective ☐
3. Level/year at which this course is offered: 7/4
4. Pre-requisites for this course (if any)**:** Computer Architecture (503323-3)
5. Co-requisites for this course (if any)**: None**

6. Mode of Instruction (mark all that apply)

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

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	45
2	**Laboratory/Studio**	30
3	**Tutorial**	
4	**Others** (specify)	
	Total	75

B. Course Objectives and Learning Outcomes

1. Course Description

This course covers the microprocessor and microcomputer systems architectures. The architecture of a specific 16-bit Microprocessor, assembly language programming, data representation, addressing modes, instruction sets, I/O programming, interrupts, assembly process, cross assemblers and debugging. Bus systems, Memory subsystems, Interfacing and peripherals.

2. Course Main Objective

1. To introduce the basic concepts of microprocessor architecture.
2. To learn assembly language programming skills.
3. To provide extensive knowledge of microprocessor based systems and interfacing.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Describe the basic architecture of a 16 bit microprocessor.	K1
1.2	Write the assembly language program for the target microprocessor.	K1
1.3	Describe addressing modes.	K1
1.4	Define the assembly language instructions of the target microprocessor.	K1
2	**Skills :**	
2.1	Apply the interrupt structures and microprocessor interfacing to memory and simple I/O subsystems	S3
3	**Values:**	
3.1		
3.2		
3.3		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to the microprocessors and microcomputer-based systems; families, types, and characteristics.	3
2	The microprocessor and its architecture Internal Architecture, Real mode memory addressing	3
3	Addressing modes Data addressing modes	4
4	Addressing modes Program memory addressing modes, Stack memory addressing modes	5
5	Data movement instructions MOV, PUSH/POP, Load Effective Address, Data movement instructions String Data Transfers, Misc. Data Transfers Instructions, Assembler details	5
6	Arithmetic and logic instructions Addition, subtraction and comparison, Multiplication and division, BCD and ASCII arithmetic, Basic logic instruction, Shift and rotate, String comparison	5
7	Program control instructions The Jump group, Controlling the flow of assembly language program, Procedures	5
8	Program control instructions Introduction to Interrupts, Machine control and miscellaneous instructions	5
9	Basic I/O Interface I/O port address decoding, The Programmable Peripheral Interface (8255), 8254 Programmable Interval Timer	5
10	Interrupts Basic Interrupt Processing, Hardware and software interrupts, 8259A Programmable Interrupt Controller, using assembly language with C/C++ for 16bit applications, Separate assembly objects	5
11	Lab	30
Total		75

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**		
1.1	Describe the basic architecture of a 16bit microprocessor.	Lecture Discussion Problem Solving Laboratory	Written Exams Quizzes Assignments
	Write the assembly language program for the target microprocessor.	Lecture Discussion Problem Solving Laboratory	Written Exams Quizzes Assignments
	Describe addressing modes.	Lecture Discussion Problem Solving Laboratory	Written Exams Quizzes Assignments
1.2	Define the assembly language instructions of the target microprocessor.	Lecture Discussion Problem Solving Laboratory	Written Exams Quizzes Assignments
2.0	Skills		
2.1	Apply the interrupt structures and microprocessor interfacing to memory and simple I/O subsystems.	Lecture Discussion Problem Solving Laboratory	Written Exams Quizzes Assignments Oral Test Practical Test
3.0	**Competence**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Lab Exam	15	%20
2	Midterm Exam	7	%20
3	Assignments and Quizzes	10	%10
4	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 :

Teaching staff provide at least 6 office hours for students to help them in the course as well as in any other academic issues.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Barry B. Brey, The Intel Microprocessors, 8th edition, Prentice Hall, 2009
Essential References Materials	Muhammad Ali Mazidi and Janice Gillispie Mazidi, The 80x86 IBM PC and Compatible Computers. "Assembly Language Design & Interfaces", 3rd edition, Prentice Hall, 2002
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Traditional Classrooms, Laboratories
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show
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
Extent of achievement of course learning outcomes	Students	Indirect (Survey)
Effectiveness of Teaching and assessment	Students	Indirect (Survey)
Extent of achievement of course learning outcomes	Faculty	Course Report

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