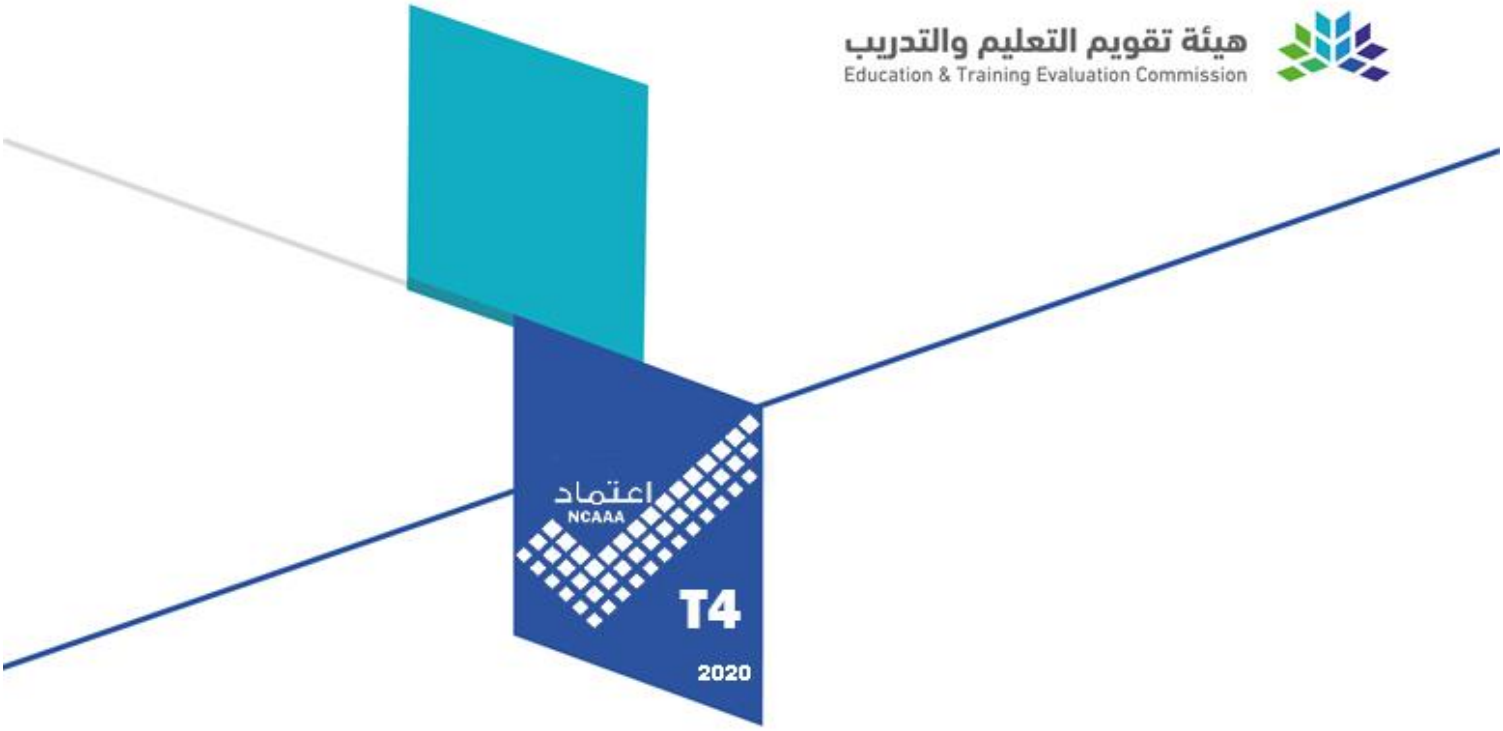
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	**Microprocessors & Assembly Language Programming**
Course Code:	**501326-3**
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:3
2. Course type **a.** University ☐ College ☐ Department ☒ Others ☐ **b.** Required ☒ Elective ☐
3. Level/year at which this course is offered: 7th/3rd
4. Pre-requisites for this course (if any)**: 503221-4 Digital Logic Design**
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	Learning Hours
1	**Lecture**	30
2	**Laboratory/Studio**	20
3	**Tutorial**	
4	**Others** (specify)	
	Total	50

B. Course Objectives and Learning Outcomes

1. Course Description

Microprocessor architecture and systems. Assembly language programming of microprocessors, data representation, addressing and instruction sets, I/O programming, interrupts, assembly process, cross assemblers and debugging.

2. Course Main Objective

- To introduce the basic concepts of microprocessor architecture.
- To learn assembly language programming skills.
- 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 current 16bit microprocessor with hands on experience.	K1
1.2	Describe Memory Addressing Segment and Offset Addressing Data Addressing Modes Program Memory Addressing Modes and Stack Memory Addressing Modes.	K1
1.3	Explain the correspondence between instruction execution and the timing signals on the microprocessor external buses and pins	K1
2	**Skills :**	
2.1	Use assembly language for programming of the target microprocessor.	S1
2.2	Apply the interrupt structures and microprocessor interfacing to memory and simple I/O subsystems.	S1
3	**Values:**	
3.1		
3.2		
3.3		
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, program memory addressing modes, stack memory addressing modes.	**6**
4	Data movement instructions MOV, PUSH/POP, Load Effective Address. Data movement instructions String Data Transfers, Misc. Data Transfers Instructions, Assembler details	**6**
5	Arithmetic and logic instructions Addition, subtraction and comparison, multiplication and division, BCD and ASCII arithmetic, basic logic instruction, shift and rotate instructions, string comparison.	**3**
6	Program control instructions, the Jump group, controlling the flow of assembly language program, procedures.	**3**
7	Introduction to interrupts, interrupt processing, hardware and software interrupts, programmable interrupt Controller.	**3**
8	Using assembly language with C/C++ for 16bit applications, Separate assembly objects.	**3**
Total		30

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	Describe the basic architecture of a current 16bit microprocessor with hands on experience.	Lectures	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey
1.2	Describe Memory Addressing Segment and Offset Addressing Data Addressing Modes Program Memory Addressing Modes and Stack Memory Addressing Modes.	Lectures Labs	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey
1.3	Explain the correspondence between instruction execution and the timing signals on the microprocessor external buses and pins	Lectures Labs	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey
2.0	**Skills**		
2.1	Use assembly language for programming of the target microprocessor.	Lectures Labs	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey
2.2	Apply the interrupt structures and microprocessor interfacing to memory and simple I/O subsystems.	Lectures Labs	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey
3.0	**Values**		
3.1			
3.2			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Home Works /Student Participation-Attendance	Every Week	10%
2	Quizzes	Week 3 and 8	10%
3	Mid-Term	Week 6	20%
4	Lab Score	Week 10	20%
5	Final Examination	Week 11	40%

***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 Online BlackBoard Learn

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• The Intel Microprocessors • Barry B. Brey • 7th Edition 2006 • Prentice Hall
Essential References Materials	• The 80x86 IBM PC and Compatible Computers. "Assembly Language Design & Interfaces" • Muhammad Ali Mazidi and Janice Gillispie Mazidi • 3rd Edition 2002 • Prentice Hall
Electronic Materials	•
Other Learning Materials	•

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• Classroom with 30 chairs • Computer Lab with Micro-Processor Emulator
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	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	• Review CAF (Course assessment file) • Alumni surveys. 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	CS council
Reference No.	Meeting #12
Date	23-10-1443