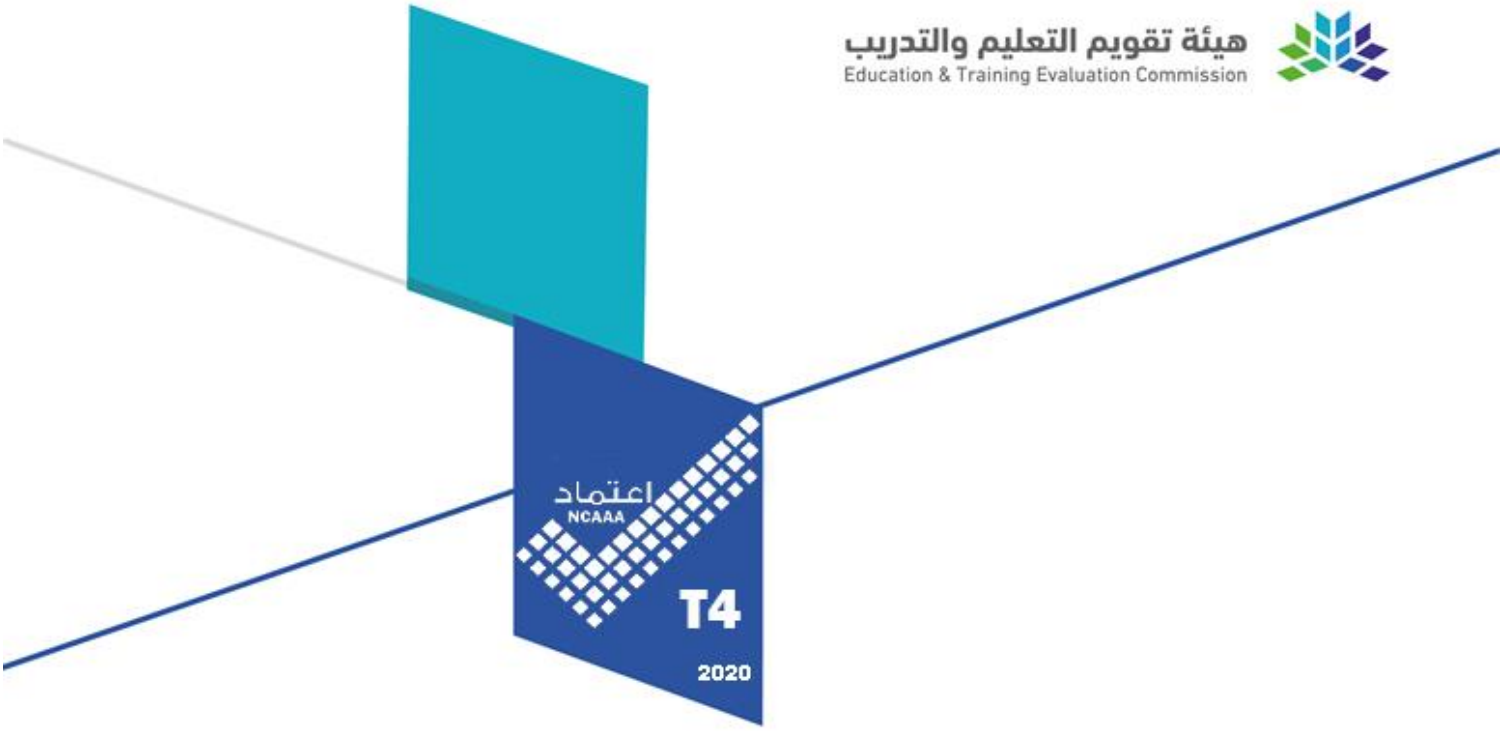
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Computer Organization and Assembly Language
Course Code:	CSI 313
Program:	Computer Science and Information
Department:	Computer Science and Information
College:	College of Science at Az Zulfi
Institution:	Majmaah University

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A. Course Identification

1. Credit hours: (3) (2 Lec + 2 lab)
2. Course type **a.** University ☐ College ☐ Department ■ Others ☐ **b.** Required ■ Elective ☐
3. Level/year at which this course is offered: 5th Level – 3rd year
4. Pre-requisites for this course (if any)**: Logic Design – CS1 223**
5. Co-requisites for this course (if any)**: N/A**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	48	80%
2	**Blended**	6	10%
3	**E-learning**	0	0%
4	**Distance learning**	0	0%
5	**Other**	6	10%

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	15
3	**Tutorial**	15
4	**Others** (specify)	-
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description

The goal of this course is to introduce topics related to the organization and operation of computers. Topics include the main components of computers (central processing unit, primary and secondary memory, common peripheral devices, and computer communications hardware), data representation in computer systems, simple computer design, cache memory, programming in assembly language, and input/output and storage systems. Also featured is an overview of parallel architectures.

2. Course Main Objective

The main objective of this course is to develop a basic understanding of computer system organization, learn to program computer systems at the machine and assembly levels, understand what roles are carried out by the microarchitecture, data flow and control flow portions of computers, understand how a high level language is translated from text, to assembly, to machine language, and learn how I/O devices are controlled by microprocessors

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Understand the major blocks of a computing system and how they interact to perform a specific task.	k2
1.2	Express an understanding of the development and evolution of computers over time.	k2
1.3	Understand how information is represented and stored in a computer and how it is processed.	
1...		
2	**Skills :**	
2.1	Show an understanding of how different functions of a computer are performed using different sub-components	s1
2.2	Writing assembly programs for different application	s3
2.3		
2...		
3	**Values:**	
3.1	Apply derived knowledge to understand and develop assembly language programs and Memory Structure.	c3
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Computer Systems Organization: The Main Components of a Computer, Standards Organizations, Evolution of Computers, The von Neumann Model, Non-von Neumann Models. Lab Work: Introduction to Assembly Language and Simulator	8
2	Data Representation in Computer Systems: Positional Numbering Systems, Decimal to Binary Conversions, Signed Integer Representation, Floating-Point Representation, Character and Transmission, Error Data Recording for Codes,Codes Detection and Correction. Lab Work: Variable storage in registers and memory using various representations. Performing Simple Arithmetic and Logic Operations.	8
3	An Introduction to a Simple Computer: CPU Basics and Organization, The Bus, Clocks, The Input/Output Subsystem, Memory Organization and Addressing, Interrupts, Registers and Buses, The Instruction Set Architecture, Register Transfer Notation, Instruction Processing, A Simple Program, Real-World Examples of Computer Architectures. Lab Work: Implementing Loops and Introduction to Hardware and Software Interrupts. String and Stack Operations..	16
4	Cache and Main Memory: Types of Memory, The Memory Hierarchy, Cache Memory, Virtual Memory, A Real-World Example of Memory Management. Lab Work: Moving data from Main Memory to Cache and Registers and vice versa. Using Procedures and Parameter Passing.	12

5	Input/ Output and Storage Systems: Amdahl's Law, I/O Architectures (I/O Control Methods, I/O Bus Operation, Interrupt-Driven I/O), Magnetic Disk Technology, Optical Disks, Magnetic Tape, RAID, Data Compression. Lab Work: Input/ Output using Assembly and Performing more Arithmetic and Logic Operations.	16
6		
...		
Total		56

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 the major blocks of a computing system and how they interact to perform a specific task.	Lectures Lab demonstrations Case studies Individual presentations	Written Exam Homework assignments Class & Lab Activities Quizzes
1.2	Express an understanding of the development and evolution of computers over time.		
1.3	Understand how information is represented and stored in a computer and how it is processed.		
2.0	**Skills**		
2.1	Show an understanding of how different functions of a computer are performed using different subcomponents	Lectures Lab demonstrations Case studies Individual presentations Brainstorming	Written Exam assignments Lab Activities Quizzes
2.2	Writing assembly programs for different application		
2.3	Student will gain experience in the application of fundamental Computer Science methods and algorithms in the development of modern memory organization, storage devices and microprocessor for modern world computers.		
3.0	**Values**		
3.1	Apply derived knowledge to understand and develop assembly language programs and Memory Structure.	Small group discussion Whole group discussion Brainstorming Presentation	Written Exam Homework assignments Lab assignments Class Activities Quizzes
3.2	Learn how to search for information through library and internet.		
3.3	Communicate with teacher, ask questions, solve problems, and use computers.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	First written mid-term exam	6	15%
2	Second written mid-term exam	12	15%
3	Class activities, group discussions, Presentation	Every 2 weeks	10%
4	Homework + Assignments	After Every chapter	10%
5	Electronic exam	14	10%
6	Lab activities	15	40%
7	Final written exam	16	15%
8			

***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 :
Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- 6-office hours per week in the lecturer schedule.
- The contact with students by e-mail, mobile, office telephone, website and BlackBoard.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	The essentials of computer organization and architecture by Linda Null, Julia Lobur, Jones and Bartlett Publishers
Essential References Materials	• William Stallings, Computer Organization and Architecture: Designing for Performance, 9th Edition, Prentice Hall, 2012. Kip Irvine, Assembly Language for x86 Processors, 7th Edition, Prentice Hall, March 2014.
Electronic Materials	https://www.coursera.org/
Other Learning Materials	Videos and presentations made available on BlackBoard e-Learning platform.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms with required digital aids and to support traditional method of teaching using blackboard.

Item	Resources
	Classrooms with proper lighting and air conditioning system integrated with the sound System /audio system. Classroom with smart board interface, display screen and a computer to aid the sessions
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board with supporting software / computers with updated versions of software as required to understand the subject concepts.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	**N/A**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Strategies for Obtaining Student Feedback on Effectiveness of Teaching	Instructor	Analysis of students' results. Observation during class work. Students' evaluations. Colleagues' evaluations. Evaluation questionnaire filled by the students. Interview a sample of students enrolled in the course to solicit their opinions
Other Strategies for Evaluation of Teaching	the Department	Self-assessment. External evaluation. Periodic review of course (the Commission of study plans).
Processes for Improvement of Teaching	the Department	Taking into account the recommendations yielded from the internal review of the course. Guidelines about teaching the course provided by the study plans commission. Department guidelines pertaining the faculty member's performance acquired using direct observation. Training and development. Workshops to improve the educational process
Processes for Verifying Standards of Student Achievement	Instructor	check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution. Instructors of the course working together with Head of Department to adopt a unique process of the evaluation.

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.	Instructor	Comparison of the course to its counterparts offered in similar departments. Periodic revision of course description by faculty member. Periodic revision of course description by the study plans and schedules Commission. Update learning resources related to the course to ensure that the course is up-to-date with the developments in the field. Make use of statistical analysis of course evaluation carried out by the students to improve and develop the course. Provide an opportunity to the students to express their opinions about what is taught and receive suggestions and evaluate their effectiveness.

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	