هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Computer Organization**
Course Code:	**CS 322**
Program:	**Computer Science/Information Technology**
Department:	**Computer Science**
College:	**College of Computer and Information Science**
Institution:	**Majmaah University**

Table of Contents

A. Course Identification **3**

6. Mode of Instruction (mark all that apply) 3

B. Course Objectives and Learning Outcomes **3**

1. Course Description 3

2. Course Main Objective 3

3. Course Learning Outcomes 4

C. Course Content **4**

D. Teaching and Assessment **4**

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 4

2. Assessment Tasks for Students 5

E. Student Academic Counseling and Support **5**

F. Learning Resources and Facilities **5**

1.Learning Resources 5

2. Facilities Required 6

G. Course Quality Evaluation **6**

H. Specification Approval Data **6**

A. Course Identification

1. Credit hours: 3(3,0,1)
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 8
4. Pre-requisites for this course (if any)**: MH 121**
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**	44	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces students with the fundamentals of computer organizations and architectures. Topics included are: Organization and Architecture, Computer Components, Computer Function, Interconnection Structures, Bus Interconnection, Binary Numbers, The Decimal System. The Binary System, Converting between Binary and Decimal, Hexadecimal Notation, Binary Multiplication, Floating Point Numbers Boolean functions and logic gate, Design of combinational Circuits Instruction Set Architecture, Assemblers, Assembly Language Programming, External Memory, Cache Memory, Paging & Segmentation, Design of Data Path, Design of Control Unit, Instruction Execution Characteristics, Reduced Instruction Set Architecture, The RISC versus CISC Controversy.

2. Course Main Objective

The course aims to enables the students to learn the internal working of a computer. The students study the basics of memory organization, number systems and their conversions, design of logic circuits and functioning of CPU.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Identify the basic components and interconnections of computer system.	K1
1.2	Understand the details of numbering systems conversion and representation.	K1
1.3		
1.4		
2	**Skills :**	
2.1	Design logic circuits by applying the concepts of Boolean Algebra and K-Maps	S1
2.2	Apply assembly language programming to solve problems.	S1
2.3	Describe the impact of memory caching and hierarchy options on the design of computer systems.	S1
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Computer Components, Computer Function, Interconnection Structures, Bus Interconnection	4
2	Numbering systems, converting between Binary and Decimal, Hexadecimal systems	4
3	Computer Arithmetic (addition, subtraction and multiplication)	4
4	Boolean Function simplification	4
5	Karnaugh maps and Logic Gates	4
6	Design of combinational Circuits	4
7	MARIE Instruction Set Architecture	4
8	Assembly Language Programming	4
9	Cache memory organization	4
10	Virtual memory organization	4
11	Reduced Instruction Set Architecture	4
Total		44

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	Identify the basic components and interconnections of computer system.	Classroom Lectures, Group Discussions, Lab demonstrations, Home assignments, Tutorial classes	Written Tests, Quizzes, Homework, Final Exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.2	Understand the details of numbering systems conversion and representation.	Classroom Lectures, Group Discussions, Home assignments, Tutorial classes	Written Tests, Quizzes, Homework, Final Exam
1.3			
1.4			
2.0	**Skills**		
2.1	Design logic circuits by applying the concepts of Boolean Algebra and K-Maps	Classroom Lectures, Group Discussions, Lab demonstrations, Home assignments, Tutorial classes	Written Tests, Quizzes, Homework, Final Exam, lab assignments, mini-project
2.2	Apply assembly language programming to solve problems.	Classroom Lectures, Group Discussions, Lab demonstrations, Home assignments, Tutorial classes	Written Tests, Quizzes, Homework, Final Exam
2.3	Describe the impact of memory caching and hierarchy options on the design of computer systems.	Classroom Lectures, Group Discussions, Home assignments, Tutorial classes	Written Tests, Quizzes, Homework, Final Exam
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Home Assignments/class discussions	Week 13	10%
2	Class Test 1	Week 4	10%
3	Mid-Exam	Week 8	20%
4	Class Test2	Week 12	10%
5	Lab assignments/mini project	Week 14	10%
6	Final Exam	Week 16	40%
7			
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 :
Every faculty will be assigned a number of students in the corresponding department for academic advising. Students can meet the faculty during advising hours or whenever the faculty is in the office during the specified office hours.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	1. The Essentials of Computer Organization and Architecture, Linda Null and Julia Lobor, Jones and Bartlett 2018. ISBN-13: 978-1284123036

Essential References Materials	2. Computer Organization and Architecture: Designing for performance by William Stallings, Pearson, Global Edition, 2016, ISBN-13: 978-9332570405 3. Logic & Computer Design Fundamentals (5th Edition) by by M. Morris R. Mano , Charles R. Kime, Tom Martin, Pearson, 2015. ISBN-13: 978-0133760637
Electronic Materials	https://marie.js.org/
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom, laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, smart board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Digital training board

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Test/Quiz/Mid Term/ Final Exam assessment (Extent of achievement of course learning outcomes)	Instructure	Direct
Course Survey in the middle of the semester and at the end of the semester (Effectiveness of teaching and assessment)	Students	Indirect
Final Exam Answer Scripts Verification	Peer faculty members	Review (Direct)

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	