Course Specifications

Course Title:	Computer Organization and Architecture
Course Code:	ICS 222
Program:	Information and Computer Sciences
Department:	Computer Science and Information
College:	College of Science at Az Zulfi
Institution:	Majmaah University

Table of Contents

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:	**4th Level – 2nd year**
4. Pre-requisites for this course (if any)**:**	**Logic Design - ICS 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**	48	80%
2	**Blended**	6	10%
3	**E-learning**	0	0%
4	**Correspondence**	0	0%
5	**Other**	6	10%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	45
2	**Laboratory/Studio**	15
3	**Tutorial**	15
4	**Others** (specify)	-
	Total	75
Other Learning Hours*		
1	**Study**	15
2	**Assignments**	15
3	**Library**	15
4	**Projects/Research Essays/Theses**	15
5	**Others** (video lectures)	15
	Total	75

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course provides the study of the structure, characteristics and operation of modern computer systems. It will focus on basic processor organization, Instruction Set Representation, ALU Design and Implementation, Processor Design Implementation, Memory Design and Organization, Input–Output Design and Organization, and Introduction to Multiprocessors.

2. Course Main Objective

- To understand the fundamentals concepts of computer organization and architecture.
- To provides the basic structure , characteristics and operations of modern computer systems.
- To understand the basic processor organization, data and control paths, instruction-level parallelism, pipelining, and multiple issue.
- To understand memory design and implementation of modern computer system, storage and input-output devices and their interfacing to the processor and memory.
- To understand the basics of storage and input-output devices and their interfacing to the processor and memory.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	Students will learn about the concepts of computer organization and architecture.	k1
1.2	Students will be able to define the behavior and basic structure, characteristics and operations of modern computer systems.	k2
2	**Skills :**	
2.1	Student will develop and apply knowledge of computer organization and architecture to design the current and modern world computers.	s1
2.2	Student will gain experience in the design, development, and performance analysis of modern world computers.	s2
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.	s2
3	**Competence:**	
3.1	Communicate with teacher, ask questions, solve problems, and use computers.	c1
3.2	Use Information technology and computer skills to gather information about a selected topic.	c2
3.3	Operate questions during the lecture, work in groups, and communicate with each other and with me electronically, and periodically visit the sites I recommended.	c3

C. Course Content

No	List of Topics	Contact Hours
1	Introduction, Computer Organization and Architecture.	5
2	Basic Concepts of structure, characteristics and operations of modern computer systems.	10
3	Basics of Process organization.	10
4	Instruction Set Representation.	5
5	ALU design and implementation.	10
6	Processor design and implementation.	10
7	Memory design and organization	5
8	Input output design and organization	5
9	Introduction to Microprocessors	10
Total		70

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	Students will learn about the concepts of computer organization and architecture.	Lectures Lab demonstrations Case studies Individual presentations	Written Exam Homework assignments Class & Lab Activities Quizzes
1.2	Students will be able to define the behavior and basic structure, characteristics and operations of modern computer systems.		
2.0	**Skills**		
2.1	Student will develop and apply knowledge of computer organization and architecture to design the current and modern world computers.	Lectures Lab demonstrations Case studies Individual presentations Brainstorming	Written Exam assignments Lab Activities Quizzes
2.2	Student will gain experience in the design, development, and performance analysis of modern world computers.		
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		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	for modern world computers.		
3.0	**Competence**		
3.1	Communicate with teacher, ask questions, solve problems, and use computers.	Small group discussion Whole group discussion Brainstorming Presentation	Homework assignments Lab assignments Class Activities Quizzes
3.2	Use Information technology and computer skills to gather information about a selected topic.		
3.3	Operate questions during the lecture, work in groups, and communicate with each other and with me electronically, and periodically visit the sites I recommended.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	First written mid-term exam	6	20%
2	Second written mid-term exam	12	20%
3	Class activities, group discussions, Presentation	Every 2 weeks	5%
4	Homework + Assignments	After Every chapter	5%
5	Electronic exam	14	5%
6	Lab activities	15	5%
7	Final written exam	16	40%
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 :

Office hours - Office call – Email - Mobile

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	William Stallings, Computer Organization and Architecture 11th Edition, Pearson, 2018

Essential References Materials	Linda Null, Essentials of Computer Organization and Architecture 5th Edition, Jones & Bartlett Learning, 2018
Electronic Materials	https://www.coursera.org/
Other Learning Materials	Videos and presentations will be available on Blackboard

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. 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

Evaluation Areas/Issues	Evaluators	Evaluation Methods
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.
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	