هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title:	**Computer Organization and Architecture**
Course Code:	**IT10702**
Program:	**Information Technology**
Department:	**Information Technology**
College:	**Computer Science and information technology**
Institution:	Albaha University
Version:	*Course Specification Version Number*
Last Revision Date:	April 2023.

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3				
2. Course type					
a.	University ☐	College ☐	Department ☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered: Level 7 / 3rd Year					
4. Course general Description This course provides a comprehensive understanding of computer organization and architecture. In this course, students will acquire a fundamental understanding of the following topics: Computer design fundamentals, Performance evaluation, Principles of instruction sets, Processor organization and design, Pipelining techniques, Instruction and arithmetic pipelines, Dynamic and speculative execution, Precise exception handling, CISC, RISC, and VLIW processors, Memory hierarchy, Virtual memory, Multilevel caches, Storage and I/O systems, Introduction to multi-core, multiprocessors, and clusters, Emerging trends in computer architecture.					
5. Pre-requirements for this course (if any): None					
6. Co- requirements for this course (if any): None					
7. Course Main Objective(s) The primary objective of this course is to educate students on the following topics: • Outlining the progression of computer architecture • Identifying various computer components and understanding how they are interconnected. • Memorizing the logic and number systems that form the foundation of the computer revolution, including instruction sets and their relevance to computing. • Evaluating a broad range of architectural and technological concepts related to computer operation. • Developing skills for working independently as well as collaboratively • Effectively communicating ideas and techniques through oral presentations.					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	33	100%
2.	E-learning		
3.	Hybrid ● Traditional classroom ● E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	33
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	33

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Describe the evolution of computer architecture	K1	- Lectures - presentation - Discussions	- Home work (rubric) - Quizzes - Midterm exam - Final Exam
1.2	Identify computer components and their interconnections	K2	- Lectures - presentation - Discussions	- Home work (rubric) - Quizzes - Midterm exam - Final Exam
2.0				

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Analyze a range of architectural and technological concepts for computer operation.	S1	- Demonstrations - Group Discussion - Group Projects - Case Studies	- Home work (rubric) - Quizzes - Final Exam - Project evaluation form (rubric)
2.2	Practice the logic and the number system behind the computer revolution as well as the instruction sets and their relevance to computing	S2	- Lectures - Discussions - Presentations - Demonstrations - Practice Exercises - Tutorials - Seminars	- Home work (rubric) - Midterm exam - Final Exam
2.3	Communicate concepts and techniques in oral presentations	S5	- Slide Presentations - Presentations - Discussions - Group Projects	- Viva-voce (Rubric) - Presentation Assessment (Rubric)
3.0				
3.1	Work both independently and collaboratively	V1	- Presentation - Discussions - Group Projects - Case Studies - Seminars	- Rubrics - Note Cards

C. Course Content

No	List of Topics	Contact Hours
1.	Basic Concepts and Computer Evolution	3
2.	Performance Concepts	3
3	A Top-Level View of Computer Function and Interconnection	3
4	The Memory Hierarchy: Locality and Performance	3
5	Cache Memory, Internal memory, external memory	6
6	Input/Output	3
7	Number Systems, Computer arithmetic, digital logic	6
8	Central processing unit	3

9	Parallel Processing, multicore computers	3
Total		33

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Home work	Every two weeks	10%
2.	Mid-term exam	6	20%
.3	Quiz	10	10%
4	Project evaluation form (rubric)	12	10%
5	Final Exam	13	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	- William Stallings, Computer Organization and Architecture: Designing for Performance, 11th Edition, Prentice Hall, 2022.
Supportive References	- Linda Null, Essentials of Computer Organization and Architecture, 6th Edition, Jones & Bartlett Learning, 2023 - Carl Hamacher, et al. Computer Organization and Embedded Systems, 6th Edition, McGraw-Hill Companies, Inc. 2012
Electronic Materials	- ACM (Association for Computer Machinery) web site - http://www.acm.org/ - ACM SIGARCH (Special Interest Group on Computer Architecture) -http://www.sigarch.org/ - IEEE Computer Society web site - http://www.computer.org/portal/web/guest/home - Open access course material online
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	An instructor computer station with: – High speed Internet connection – A desktop computer with a programming development tool – Power outlets for instructor's laptop plug-in – Lecture rooms provide enough space for the students.
Technology Resources (AV, data show, Smart Board, software, etc.)	– A digital image projection system with connection to desktop computer and laptop computer. – High speed Internet connection. – An instructor computer station
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	– None
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Teaching	• Students • Faculty • Peer Reviewers • Program Leader • Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Course evaluation by Peer Reviewers (indirect). • Class visit by Program Leader • Comprehensive Course report (where we can find information about teaching difficulties and action plan, …)
Effectiveness of Assessment	• Students • Faculty • Peer Reviewers • Course Coordinator • Exam Evaluation Committee • Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Assessment results (direct) • Course evaluation by Peer Reviewers (indirect).

Assessment Areas/Issues	Assessor	Assessment Methods
		• Comprehensive Course report (where we can find information about assessment difficulties and action plan, …) • Exam evaluation by the Exam Evaluation Committee (indirect)
Extent of achievement of course learning outcomes	• Faculty • Program Leader • Course Coordinator	• Student Results (direct) • Comprehensive Course report (where we can find the CLO assessment results)
Quality of learning resources	• Students • Faculty • Peer Reviewers • Course Coordinator	• Surveys (indirect) • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about difficulties and challenges about learning resources as well as consequences and action plan, …)

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	