هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

(Bachelor)

Course Title:	Computer Architecture
Course Code:	503323-3
Program:	Bachelor in Computer Science
Department:	Department of Computer Science
College:	College of Computers and Information Technology
Institution:	Taif University
Version:	V1.2024
Last Revision Date:	01/02/2024

Table of Contents

A. General information about the course:

1. 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: (5/3)					
4. Course general Description:					
This course will provide the student with an in-depth study of the organization of the central processing unit, arithmetic logic unit, control unit, instruction set design, and addressing modes of digital computers. Register Transfer model of processors and data paths are considered. Extensive emphasis is placed on the translation of assembly language instructions into their micro sequence operations within the control unit. Both hardwire and microprogramming techniques will be covered. Modern architectures and its features (Von-Neumann vs Harvard Architecture). Parallel architecture and inter-connection networks.					
5. Pre-requirements for this course (if any)**:**					
503221-4					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
1. Analyze and Design digital hardware modules used in digital computers **2. Organize and design a basic digital computer according to a given set of specifications (including ALU, Instruction Formats, Addressing modes, and Data Transfer.** **3. Program the Basic Computer using Machine language, Assembly language, and 2-pass Assembler.** **4. Analyze the different organizations of the central processing unit.** 5. Be acquainted with pipelining and vector processing as well as multiprocessing					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3	100%

No	Mode of Instruction	Contact Hours	Percentage
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Define the basic concepts and goals of Computer Architecture	K1	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
1.2	Understand Logical organization of computer systems	K1	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
1.3	Understand modern architectures and its features (Von-Neumann vs Harvard Architecture)	K1	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.4	Explain the fundamental concepts of parallel architecture and interconnection networks	K1	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
...				
2.0	**Skills**			
2.1	Design and implement subsystems including arithmetic and logical units control units memory and I/O devices	S1	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
2.2				
2.3				
2.4				
...				
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
3.3				
3.4				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Computer Architecture	3
2.	Digital Logic Circuits and Components	5
3.	Number Systems, Arithmetic operations	5
4.	Register Transfer Language and MicroOps	5
5.	Basic Computer Organization and Design	5
6.	Computer Arithmetic Unit Design	5
7.	Programming the Basic Computer	4
8.	Central Processing Unit CPU Design	5
9.	Pipeline and Vector Processing	5

10.	Multiprocessor Design	3

Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	Continues	10%
2.	Midterm Exam	7	25%
3.	Project	12	15%
4.	Quizzes	Continues	10%
5.	Final Exam	16	40%
6.			
...			

*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, 9th edition 2013.
Supportive References	John L. Hennessey and David L. Patterson, Computer Organization and Design: The Hardware/Software Interface, Morgan Kaufmann Publishers, 4th Ed, 2009
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Traditional Classrooms
Technology equipment (projector, smart board, software)	White Board. Datashow.
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect (Surveys)
Effectiveness of Students assessment	Students	Indirect (Surveys)
Quality of learning resources	Students	Indirect (Surveys)
The extent to which CLOs have been achieved	Faculty	Direct (Course Report)
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**CS COUNCIL**
REFERENCE NO.	**MEETING #11**
DATE	**07/03/2024**