



Course Specifications

Course Title:	Computer Architecture
Course Code:	503323-3
Program:	Bachelor in Computer Science
Department:	Department of Computer Engineering
College:	College of Computers and Information Technology
Institution:	Taif 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		3
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		4
E. Student Academic Counseling and Support	5	
F. Learning Resources and Facilities	5	
1. Learning Resources		5
2. Facilities Required		5
G. Course Quality Evaluation	5	
H. Specification Approval Data	6	



A. Course Identification

1. Credit hours: 3
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 9/3
4. Pre-requisites for this course (if any): Digital Logic Design (503221-4)
5. Co-requisites for this course (if any): None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	5	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	50
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	50

B. Course Objectives and Learning Outcomes

1. Course 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. Reduced Instruction Set Computers (RISC) and Complex Instruction Set Computers (CISC) are introduced as well. Parallel architecture and inter-connection networks.

2. Course Main Objective

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

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Define the basic concepts and goals of Computer Architecture	K1
1.2	Understand Logical organization of computer systems	K1
1.3	Understand major architectural features of modern computer systems RISC and CISC	K1
1.4	Explain the fundamental concepts of parallel architecture and interconnection networks	K1
2	Skills :	
2.1	Design and implement subsystems including arithmetic and logical units control units memory and I/O devices	S1
2.2		
2.3		
2...		
3	Values:	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Computer Architecture	5
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	5
8	Central Processing Unit CPU Design	5
9	Pipeline and Vector Processing	5
10	Multiprocessor Design	5
Total		50

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	Define the basic concepts and goals of Computer Architecture	Lecture Discussion	Written Exams Quizzes



		Problem Solving	Assignments
1.2	Understand Logical organization of computer systems	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
1.3	Understand major architectural features of modern computer systems RISC and CISC	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
1.4	Explain the fundamental concepts of parallel architecture and interconnection networks	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	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
2.2			
...			
3.0	Values		
3.1			
3.2			
...			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments	2, 4, 7,9	20%
2	Midterm Exam	6	30%
3	Final Exam	12	50%
4			
5			
6			
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 :

Teaching staff provide at least 6 office hours for students to help them in the course as well as in any other academic issues.

F. Learning Resources and Facilities



1. Learning Resources

Required Textbooks	William Stallings, Computer Organization and Architecture, 9 th edition 2013.
Essential References Materials	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. Facilities Required

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

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	Students	Students surveys and Students course evaluation
Improvement of Teaching	Course Coordinator	deficiencies based on the student Evaluation, faculty input, course file, and program assessment
Verifying Standards of Student Achievement	Curriculum Committee	<ul style="list-style-type: none"> Review CAF (Course assessment file) Alumni surveys. Periodic exchange and remarking of tests or a sample of assignments with staff at another

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	CS council
Reference No.	Meeting #12
Date	23-10-1443

