

<b>CT-404</b>	<b>:</b>	<b>Computer Architecture II</b>	<b>First Semester</b>
<b>Text Book</b>	<b>:</b>	Computer Architecture and Organization (3 <sup>rd</sup> Edition) by John P. Hayes	
<b>Period</b>	<b>:</b>	<b>45</b> periods for 15 weeks (3 periods/week) (Lecture + Lab)	

### Course Description

Basic hardware and software concepts in the analysis and design of embedded systems. This course discuss the basic structure of a digital computer and used for understanding the organization of various units such as Control unit, Arithmetic and Logical unit, Memory unit and I/O unit in a digital computer.

### Course Objectives

- To have a thorough understanding of the basic structure and operation of a digital computer.
- To understand the operation of the arithmetic unit including the algorithms & Implementation of Fixed-point and floating-point arithmetic operations.
- To learn the Concepts behind advanced pipelining, vector processing techniques and control unit designs.
- To understand the current state of art in memory system design.
- To study the different ways of communicating with I/O devices and standard I/O interfaces.

### References

1. Computer Architecture and Organization (3<sup>rd</sup> Edition) by John P. Hayes McGraw Hill International Book Company
2. Computer Organization and Architecture; Designing for Performance (8<sup>th</sup> Edition), 2010 by W. Stallings Prentice Hall
3. Computer Organization (5<sup>th</sup> Edition) by C. Hammacher, Z. Vranesic, S. Zaky McGraw Hill
4. Computer Architecture (5<sup>th</sup> Edition) by BehroozParhami, Oxford Press
5. Computer Organization by Tannenbaum

## Assessment Plan for the Course

Paper Exam:	60%
Attendance:	10%
Test/ Quiz:	10%
Lab:	10%
Lab Assessment:	10%

## Tentative Lecture Plan

No.	Chapter		Page	Period	Examples and Problems
	<b>Chapter 4</b>	<b>Datapath Design</b>	223-301	<b>30</b>	
1.	4.1 4.1.1	Fixed Point Architecture Addition and Subtraction	223-238	5	Eg. 4.1 Prob. 4.2, 3, 5, 6, 8
2.	4.1.2	Multiplication	238-244	5	Eg. 4.2, 4.3 Prob. 4.11, 12, 14
3.	4.1.3	Division	244-251	4	Prob. 4.19, 20
4.	4.2 4.2.1	Arithmetic-Logic Units Combinational ALUs	252-256	2	Eg. 4.4
5.	4.2.2	Sequential ALUs	256-265	5	E.g. 4.5 Prob. 4.23, 24, 25, 26, 27
6.	4.3 4.3.1	Advanced Topics Floating-Point Arithmetic	266-275	4	Eg. 4.6 Prob. 4.29, 30
7.	4.3.2	Pipeline Processing	275-292	5	Eg. 4.8, 9 Prob. 4. 32
	<b>Chapter 5</b>	<b>Control Design</b>	303-331	<b>13</b>	
8.	5.1 5.1.1	Basic Concepts Introduction	303-308	4	
9.	5.1.2	Hardware Control	308-319	5	Eg. 5.1
10.	5.1.3	Design Examples	319-331	4	Eg. 5.2, 5.3 Prob. 5.1, 2
11.		Revision		<b>2</b>	

