



## Introduction to Computer Architecture

### SHORT COURSE DESCRIPTION

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Computer organization and architecture including computer arithmetic, digital logic, principles of assembly language, memory system organization, computer interfacing, CISC and RISC architecture. The objective of the course is to provide an introduction to the hardware and software architecture of computer systems.

### READING MATERIALS

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Textbooks:

Computer Organization and Architecture(required)L. Null & J. Lobur, Jones and Bartlett, 2019, 4th/5th, ISBN 978-1-284-04561-1.

### COURSE REQUIREMENTS AND GRADING

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Grading: The course grade will use +/- grading scheme and be determined by assignments (Class Exercises), attendance, participation, quizzes, and two exams(One midterm Exam and one final exam.).

Class Exercise (10 to 12 assignments)	250
Quizzes and Attendance:	150
Midterm Exam :	300
Final Exam:	300
Total	1000

#### Attendance

- Students who are absent from class are responsible for any missed work, assignments or assessments (e.g., quizzes and tests etc.).
- For all class meetings, daily attendance will be taken at the beginning of each meeting. You are permitted one absence without penalty. Use this one absence wisely for any doctor's appointments or sickness.
- Tardiness: Being late at least 5 minutes for class, or leaving it 10 minutes early will affect your attendance record. These are disrespectful to the class as well as to the instructor. Two times of tardiness will be counted as one absence.

Assignments(Class Exercises): You will be expected to complete 10 or more class exercises.

- Start each assignment as soon as it is handed out, so that you have time to ask questions.
- The homework and lab assignments will receive a grade of 0 if not received, or received after the cutoff date and time.
- Class Exercises should be turned in on the date specified the instructor. Assignments will NOT be accepted after this point. You should always plan to turn in something on time for partial credit.
- All assignments are expected to be INDIVIDUAL work. All work handed in must be original. Duplicate or very similar programs receive a negative grade.

### COURSE SCHEDULE

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#### – WEEK I –

Monday (27 June):

Introduction

(Ch. 1)

Tuesday (28 June): Data Representation in Computer Systems (Ch. 2)  
• Positional Numbering System  
• Converting Between Bases

Wednesday (29 June): Data Representation in Computer Systems (Ch. 2)  
• Signed Integer Representation  
• Floating-Point Representation  
• Character Codes

Thursday (30 June): Data Representation in Computer Systems (Ch. 2)  
• Error Detection and Correction

– WEEK II –

Monday (4 July): Boolean Algebra and Digital Logic (Ch. 3)  
• Boolean Algebra  
• Logic Gates  
• Digital Components  
• Combinational Circuits

Tuesday (5 July): Boolean Algebra and Digital Logic (Ch. 3)  
• Karnaugh Maps

Wednesday (6 July): MARIE: An Introduction to a Simple Computer (CH. 4)  
• CPU Basics and Organization  
• The Bus  
• Clocks  
• I/O Subsystem  
• Memory Organization

Thursday (7 July): Midterm Exam

– WEEK III –

Monday (11 July): MARIE: An Introduction to a Simple Computer (CH. 4)  
• MARIE Assembly Language

Tuesday (12 July): MARIE: An Introduction to a Simple Computer (CH. 4)  
• MARIE Assembly Language

Wednesday (13 July) Instruction Set Architecture (Ch. 5)  
• Instruction Formats  
• Instruction Types  
• Addressing Modes

Thursday (14 July): Instruction Set Architecture (Ch. 5)  
• Instruction Pipelining  
• Examples of ISAs

Friday(15 July) Memory (Ch. 6)  
• Types of Memory  
• Cache Memory

– WEEK IV–

Monday (18 July):

Memory

(Ch. 6)

- Virtual Memory

Tuesday (19 July):

Final Exam