

	Organization: HiLCoE School of Computer Science & Technology	Ref. No: Doc No. CD/HiL/001 Version: 001
Title: Course Outline	Page 1 of 2	

Course Code	CS302
Course Title	Computer Organization and Assembly Language Programming
Program	B. Sc
Course Description	This course provides an overview of the architecture and organization of a computer, such as the CPU, memory, I/O organization, and peripherals. From this course, students will learn the basics of computer architecture and low level (assembly) programming for the Intel 8086 Microprocessor.
Prerequisite	CS301
Objectives	Basic understanding of computer organization: roles of processors, main memory, and input/output devices; understanding the concept of programs as sequences of machine instructions; understanding the relationship between assembly language and machine language; development of skill in assembly language programming; understanding the relationship between high-level compiled languages and assembly language; understanding simple data path and control designs for processors; understanding memory organization, including cache structures and virtual memory schemes. The course focuses on the basic machine architecture and design of the Intel 8086 Microprocessor discussing representation of instructions and data, addressing techniques, memory organization, and execution of instructions at machine level. The Assembly programming environment will be running on Windows/DOS system, only <i>simulating</i> the Assembly programming for the Intel 8086.
Text Book	• M.Morris Manno, "Computer System Architecture", prentice Hall, 2003 (for Computer Organization) • Richard Tropper, "Programming in Assembly Language", McGraw Hill, 1994. (for Assembly Programmig)
Reference Materials	• Geogrg Dreiver, "Introduction to Programming in Assembly Language", McGraw Hill, 1995. • William Stallings, "Computer Architecture & Organization", Pearson Education, 2003.
Assessment Method	• Mid-Semester Exam: 30% • Final Semester Exam: 40% • Assignments: 10% • Lab: 20%
Year	2019
Term	Winter
Instructor / Email	Ashenafi Kassahun – ashukass@gmail.com or ashenafi.kassahun@aau.edu.et
Additional Notes	• Lab attendance is mandatory. A separate course outline (supplementing this one) will be provided by the Lab Instructor.

COURSE CONTENT

1. Introduction

- Revision of Logic Design
- Architecture and Organizations

	Organization: HiLCoE School of Computer Science & Technology	Ref. No: Doc No. CD/HiL/001 Version: 001
Title: Course Outline	Page 2 of 2	

- Definition, Evolution and Types of Microprocessors and Computers
- Computer Programming and Software
- Assembly Language Programming
- 2. Microprocessor Organization**
 - General Register Organization
 - Instruction Formats
 - Addressing Modes
 - Data Transfer and Manipulation
 - Program Control
 - RISC and CISC technologies
- 3. The Intel 8086 Micro Processor Architecture**
 - Basic Computer Organization and Design
 - The Intel 8086 Architecture
 - Intel 8086 CPU Registers
 - Intel 8086 Memory address space
 - Memory Segments
 - Addressing Mode of the Intel 8086
- 4. Editing, Assembling and Linking an Assembly Program**
 - Introduction to common instructions of the Intel 8086
 - Instruction statements
 - Editing a Source Program
 - Keywords, Identifiers and Directives
 - Assembling the Source file
 - Linking object files
- 5. Programming the Intel 8086 with ELASS Assembler**
 - Data allocation statements
 - Control Transfer
 - Interrupts
 - Input/Output
 - Disk I/O
- 6. Memory Organization**
 - Memory Hierarchy
 - Main Memory
 - Cache Memory
 - Virtual Memory
 - Memory Management
- 7. Input-Output Organization**
 - Peripheral Devices
 - Input-Output Interface
 - Modes of Data Transfer
 - Priority Interrupt
 - Direct Memory Access