

Computer Organization and Architecture I

CS 2290

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Course Content

This course is intended to serve as an introduction to computer organization in general as well as assembly programming on IBM PC compatible architecture. The hardware and software of the *Intel 80X86* series of processors will be covered in some detail.

Lecture Topics:

Introduction to Computer Architecture:

- Microprocessor and computer architecture
- Operations and operands of computer hardware
- Representing instructions

Number systems and Arithmetic

- Signed and Unsigned Numbers
- Addition and Subtraction
- Logical Operations
- Constructing an Arithmetic Logic Unit
- Multiplication and Division
- Floating Point numbers

80x86 Assembly

- Overview of 80x86 assembler (segments, registers and organization)
- Program structure
- I/O operations
- Data movement instructions
- Conditionals and Branching instructions
- Arrays
- Macros and Procedures
- Interrupts
- String processing
- Video operations (text and graphics)
- Parameter passing and stack operations

The Processor and Datapath

- Registers, ALU, and multiplexer
- PC and memory
- Simple datapath
- Control unit

Exceptions and Interrupts

- Exceptions and Exception handling
- Interrupts and Interrupt handling

Interfacing Processors and Peripherals

- I/O interfacing
- Polled I/O
- Interrupt-driven I/O (enabling, disabling, priority)

Laboratories

Scheduled Lab facilities, the J wing computer labs (J101).

Text **Assembly Language For Intel-Based Machine 5th Edition**
By Kip R. Irvine

Marking Lab Assignments,
Homework Assignments : 30%
Midterm Exam : 25%
Class Quizzes : 10%
Final Exam : 35%

Special Notes

You will be eligible for a passing grade in this course, **only if** you obtain a minimum of 35 out of 70 marks in the **Theory/Concepts** portion of the course (exams and quizzes).