

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
COLLEGE OF COMPUTER SCIENCES & ENGINEERING

COMPUTER ENGINEERING DEPARTMENT

**COE 205 Computer Organization & Assembly Language
Syllabus - Term 993**

Catalog Description

Introduction to computer organization. Octal and Hexadecimal number systems, ASCII codes. Assembly language programming, instruction format and types, memory and I/O instructions, arithmetic instructions, addressing modes, stack operations, and interrupts. ALU and control unit design. RTL, microprogramming, and hardwired control. Practice of assembly language programming.

Prerequisite: COE 200 and ICS 201

Instructor Dr. Aiman H. El-Maleh. Room: 22/332 Phone: 2811 Email: aimane

Office Hours Sat-Sun-Mon-Tues-Wed 11:30-12:00, 2:00-3:00

Text Book: *Assembly Language Programming and Computer Architecture*, Joe Carthy, Thomson Computer Press, 1996.

Course Policies

- Grades: Laboratory 25%
 Homework 7%
 Quizzes 8%
 Exam I 15% (tentative date: July 1)
 Exam II 20% (tentative date: July 17)
 Final 25%
- Late assignments will NOT be accepted.

Course Topics

1. ***Introduction and Information Representation.*** (Appendix B, Notes) **4**
lectures
Introduction. Octal and Hexadecimal number system. ASCII code. Computer components.
2. ***Assembly Language Concepts.*** (2.1, 2.3, 2.5, 2.6, 3.3) **5**
lectures
Assembly language format. Directives vs. instructions. Constants and variables. I/O. INT 21H. Addressing modes.
3. ***8086 Assembly Language Prog.*** (3.1, 3.2, 3.4, 3.5, 4.1, 4.3, 4.4, Notes) **12 lectures**
Register set. Memory segmentation. MOV instructions. Arithmetic instructions and flags (ADD, ADC, SUB, SBB, INC, DEC, MUL, IMUL, DIV, IDIV). Compare, Jump and loop (CMP, JMP, Cond. jumps, LOOP). Logic, shift and rotate . Stack operations. Subprograms. I/O (IN, OUT). String instructions.
4. ***Computer Organization.*** (5.1, Notes) **5**
lectures
Main memory, SRAM, DRAM. External memory, magnetic and optical disks. Bus system. I/O devices. Interrupts and interrupt processing, INT and IRET.

5. ***Control Unit Design.***

(Handout)

12 lectures

1-bus, 2-bus and 3-bus CPU organization. Fetch and execute phases of instruction processing. Machine code. Control steps. Hardwired control. Microprogramming.