BLG222E – Computer Organization

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Course Objectives

- The course objective is to provide knowledge to design and build a digital computing machine with the background of digital circuits and logic.
- The students will get the understanding of computer operation, design principles, and how physical definition and software are interrelated in computer system.

Syllabus

Textbook: Computer System Architecture, Morris Mano, 3rd edition

Grading:

4 Projects	30 %
2 Midterms	30 %
Final	40 %

In order to take the final exam:

- Number of absence should be less than or equal to 5 lectures.
- At least 3 projects should be submitted. A project is assumed to be submitted if 30 points (out of 100) is given.
- Weighted average of the semester grades should be equal or higher than 30.

(Project grades)*0.3 + (midterm grades)*0.3 >= 30

Tentative course outline

1) Introduction, combinational circuits, decoders, multiplexers **(1.1-2.3)**
2) Registers, ripple counters, memory units **(2.4, 2.5, 2.6, 2.7)**
3) Register transfer language (TRL), Bus, memory transfers **(4.1, 4.2, 4.3)**
4) Arithmetic operations, logical operations, shift operations, ALU **(4.4, 4.5, 4.6, 4.7)**
5) Instruction codes, timing and control, instruction cycles **(5.1-5.5)**
6) Memory-reference instructions, IO instructions **(5.6, 5.7)**
7) Design of a complete computer **(5.8, 5.9, 5.10)**
8) Midterm 1
9) Project presentations
10) Micro-programmed control, address sequencing **(7.1, 7.2)**
11) Design of control unit **(7.3,7.4)**
12) Stack organization, reverse polish notation **(8.3)**, **Project presentations**
13) Midterm 2
14) RISC/CISC processors