CIS*2030: Structure and Application of Microcomputers
Computer Science
Fall 2016

Contact Information

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General Description

This course is intended to provide an introduction to the topic of *Computer Architecture*. Computer architecture refers to those attributes of a system that are visible to a programmer, or put another way, those attributes that have a direct impact on the logical execution of a program. As a result of this course, students will gain insight into the operation of the major components of a computer system, assembly-language programming, and computer interfacing. The Motorola 68000 has been selected as the example architecture to study, due to the simplicity and clarity of its architecture.

Course Outline

Each bullet corresponds to *roughly* 1-3 weeks of the semester.

- Binary encoding and data representation: number systems, binary arithmetic, complement arithmetic, ranges, arithmetic overflow, and other code systems
- Basic hardware components, overall architecture and data flow of a typical computer, Instruction-Set Architecture for M68000
- An assembler language view of the M68000
- Hardware support for high-level language (C) concepts: data structures, loops, conditional statements, hardware stack, functions/procedures, parameter passing, return values, stack frames, local variables, recursion and re-entrant code
- Hardware support for Operating Systems: privileged states; exception processing
- Interaction among components: device operation, device control, bus signals, input/output protocols: polling, interrupts, direct-memory access
- Caching, Virtual memory (if time permits)

Textbook

- MacKenzie S., (1995). *The 68000 Microprocessor*, Prentice-Hall. (Required)
- 68KMB Lab Exercises (Provided)

Lectures

There will be *three* lectures per week: MWF, 1:30pm to 2:20pm, ALEX 200. Course notes, reading assignments, etc. will be provided at the beginning of class. Electronic versions of the notes are not available at this time.

Course Evaluation

Your final grade will be determined as follows:

Weighting	Description	Notes
20%	Bi-Weekly Homework Assignments	**Due at beginning of class** – Late assignments will not be accepted for any reason; however, the lowest weight assignment will be dropped when calculating your final grade.
35%	Weekly Laboratory Assignments (10)	Labs are not optional. You must **complete all labs** to receive a grade in this course.
20%	Midterm Exam	**Date:** October 28, 1:30pm to 2:20pm, in class
25%	Final Exam	**Date:** December 14, 2:30pm to 4:30pm, TBA

You must score at least 50% in the **written exams** (that is, a weighted average of 22.5 out of 45) and at least 50% on **each lab exercise** to pass the course; otherwise your mark will be recorded as 45.

Teaching Assistants

Graduate Teaching Assistants allocated to this course:

- TBA

All requests for re-grades must be made by email to the marker within one week of an assignment/exam being returned.

Advising hours

- GTA advising hours: TBA
- Gary: Open-door policy; otherwise, email me to request a specific time. Please do not send questions by email.

A Word of Caution

Needless to say, plagiarism in any form must be dealt with severely. Discussion with fellow students about problems is healthy. However, when answering questions do it yourself. Be original. All cases of academic misconduct are handled by the Dean, in conjunction with the Department Chair. Successive infractions of misconduct affirmed by this process could have consequences as serious as expulsion from the University. *(It is your responsibility to acquaint yourself with the*

definitions and ramifications of academic misconduct as described in the university's undergraduate Calendar.) The risks are sufficiently great that they are not worth taking. If you are having trouble, please see the teaching assistant or the instructor for help.

Lab Schedule for Fall 2016

	MON	TUE	WED	THR	FRI
SEPT					9 **first class**
	12	13	14	15	16
	19 LAB 1	20 LAB 1	21 LAB 1	22 LAB 1	23 LAB 1
	26 LAB 2	27 LAB 2	28 LAB 2	29 LAB 2	30 LAB 2
OCT	3 LAB 3	4 LAB 3	5 LAB 3	6 LAB 3	7 LAB 3
	10 **Holiday** ☺	11 **Holiday** ☺	12 LAB 4	13 LAB 4	14 LAB 4
	17 LAB 4	18 LAB 4	19 LAB 5	20 LAB 5	21 LAB 5
	24 LAB 5	25 LAB 5	26 LAB 6	27 LAB 6	28 LAB 6
	31 LAB 6	1 LAB 6	2 LAB 7	3 LAB 7	4 LAB 7
NOV	7 LAB 7	8 LAB 7	9 LAB 8	10 LAB 8	11 LAB 8
	14 LAB 8	15 LAB 8	16 LAB 9	17 LAB 9	18 LAB 9
	21 LAB 9	22 LAB 9	23 LAB 10	24 LAB 10	25 LAB 10
DEC	28	29	30	1 October 11 labs LAB 10	2 October 10 labs LAB 10

Monday Lab:	8:30am to 11:20am	THRN, Room 2420
Monday Lab:	2:30pm to 5:20pm	THRN, Room 2420
Tuesday Lab:	8:30am to 11:20am	THRN, Room 2420
Tuesday Lab:	5:30pm to 8:20pm	THRN, Room 2420
Wednesday Lab:	5:30pm to 8:20pm	THRN, Room 2420
Thursday Lab:	8:30am to 11:20am	THRN, Room 2420
Thursday Lab:	5:30pm to 8:20pm	THRN, Room 2420
Friday Lab:	2:30pm to 5:20pm	THRN, Room 2420