



CISC 3310 – Principles of Computer Architecture



Course content:

This is a two part class – approximately 70% of the class will focus on computer architecture; the remainder on assembler language programming.

Textbooks – Not Required:

The Essentials of Computer Organization and Architecture, 2nd edition.

Authors: Null and Lobur. Publisher: Jones & Bartlett, 2006, ISBN 0-7637-3769-0.

There are numerous errors in the book. Download the errata from:

<http://computerscience.jbpub.com/ecoa/2e/>. There are also student resources at this site.

Essentials of 80x86 Assembly Language 2nd Edition

Author: Richard C. Detmer. Publisher: Jones & Bartlett, 2012, ISBN 978-1-4496-4092-7

Website:

Print course outline and the class notes from the following web site:

<http://academic.brooklyn.cuny.edu/cis/sfleisher/>

Exams, assignments:

Three/four exams and a final. The value of these exams will be discussed in class.

Three/four assembler language programming assignments.

Material:

Chapter 1: Main components of a computer; historical development; computer level hierarchy, Von Neumann model.

Chapter 2: Data representation- positional numbering systems; number conversions; signed integer & floating-point representations; character codes; error detection and correction.

Chapter 3: Boolean algebra and digital logic – logic gates; digital components; combinational & sequential circuits

Chapter 3A: Karnaugh Maps

Chapter 4: MARIE: an introduction to a simple computer. CPU basics and organization; the Bus; clocks; input/output subsystem; memory organization and addressing; interrupts; MARIE; instruction processing; assemblers; hardwired & microprogrammed control; real-world computer architectures.

Chapter 5: Instruction set architectures – instruction formats/types; addressing; pipelining; real world ISA's.

Chapter 6: Memory – types of memory; memory hierarchy; cache memory; virtual memory.

Chapter 7: Input/Output and storage systems – I/O and performance; I/O architecture; data transmission modes; magnetic disk technology; optical disks; magnetic tape.

Assembler Language:

- What is assembler language all about?
- Running your assembler language program
- The assembly/link process
- Binary and hexadecimal representation
- The relationship between binary, hexadecimal, and decimal
- Binary and hexadecimal arithmetic
- Negative numbers



- Machine instructions/assembler directives – the nature of each
- The assembler listing
- Data representation
- Equates
- Machine instructions – let's learn to code in assembler
- Turbo debugger
- Addressing - logical/physical addresses, memory segmentation
- Subroutines, procedure
- Macros
- Structures
- Conditional assembly

