

**NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY  
CSC 205 - COMPUTER ORGANIZATION (3 CR.)**

**Course Description**

Examines the hierarchical structure of computer architecture. Focuses on multi-level machine organization using a simple assembly language. Includes processors, instruction execution, addressing techniques, data representation, and digital logic. Lecture 3 hours per week.

**Course Prerequisites/Co-requisites**

Prerequisite is CSC 202, Computer Science II.

**General Course Purpose**

The course should stress the hierarchical structure of a computer. It should incorporate a simple assembly language to serve as an example of how the various components interact. The logic design part of the outline is specific and essential to this course. The functional logic design level is emphasized rather than circuit details, which will be covered in engineering courses. The functional level provides the student with an understanding of the mechanics of information transfer and control within the computer system.

**Major Topics to be Included**

- I. Introduction/review
  - A. Number representation and arithmetic
    1. Binary, octal, and hexadecimal numbers
    2. One's and two's complements and other representations
    3. Addition and subtraction
  - B. Boolean algebra and truth tables
  
- II. Multi-level machine organization
  - A. Structural overview
  - B. Digital logic and integrated circuits
    1. Boolean functions
      - a. Gates
      - b. Functions
      - c. Simplification
    2. Integrated circuits
      - a. Combinational circuits (including adders, shifters, decoders, multiplexers, ROM's)
      - b. Flip-flops
      - c. Sequential circuits (including registers, counters, RAM)
  - C. Micro-programming
  - D. Machine language level
  - E. Overview of assembly language
  - F. Memory management
    1. Virtual memory
    2. Paging
    3. Segmentation
  
- III. Other topics or enhance the above (optional)

### Suggested time allocation per topic

In order to standardize the core topics of CSC 205 so that a course taught at one campus resembles the same course taught at another campus, the following student-contact-hour minima per topic are recommended. Of course, the topics cannot be followed sequentially. Many topics are taught best as an integrated whole, often revisiting the topic several times, each time at a higher level. There are normally 48 student-contact-hours per semester for a three-unit course. The last category, *Other Optional Topics or enhance the above*, leaves ample time for an instructor to tailor the course to special needs or resources.

Ref	Topic	Hours	Percent
I	Introduction / review	--	--
A	Number representation and arithmetic	3	6
B	Boolean algebra and truth tables	5	10
II	Multi-level machine organization	--	--
A	Structural overview	6	13
B	Digital logic and integrated circuits	--	--
1	Boolean functions	3	6
2	Integrated circuits	3	6
C	Micro-programming	6	13
D	Machine language level	3	6
E	Overview of assembly language	3	6
F	Memory management	3	6
III	Other optional content or enhance the above	9	19
	Exams and quizzes	4	8
	Total	48	100