

Course Abstract

If you need accommodations due to a disability, contact Disability Services in Edison Hall Room 100, 732.906.2546.

To foster a productive learning environment, the College requires that all students adhere to the Code of Student Conduct which is published in the college catalog and website.

Course ID and Name: CSC263 Computer Organization and Architecture I

Department: Business and Computer Science

Chairperson or Course Coordinator: Dr. Aslihan Cakmak

Office Location: ED123

E-mail Address: ACakmak@middlesexcc.edu

Telephone: 732-906-2526

Prerequisites: CSC161

Co-requisites: None

Course Description:

This course presents the fundamentals of computer architecture, emphasizing RISC architecture and assembly language. Topics include binary arithmetic, Boolean algebra, gates and simple circuits, data representation, RISC architecture, RISC vs. CISC principles, and the development of RISC assembler programs.

General Education Status: N/A

Credits: 3

Lecture Hours: 2

Lab Hours: 2

Learning Outcomes:

Upon successful completion of this course, a student will be able to:

1. Describe the functional components and steps required for executing instructions.
2. Convert numbers between decimal, binary, and hexadecimal, and perform addition and subtraction in each of these bases.
3. Convert character and arithmetic data into internal representation and perform addition and subtraction in this representation.
4. Construct truth tables for and simplify Boolean functions.
5. Implement circuits using AND, OR, and NOT gates for Boolean functions.
6. Write, debug, and execute programs in a RISC assembly language that include I/O, arithmetic, conditional processing, and repetition.

7. Write, debug, and execute programs in a RISC assembly language that include bit manipulation, function calls, and data structures.
8. Translate assembler instructions into machine instructions.

Course Content Areas:

- **Unit 1-** Data representations, Boolean algebra, K-maps, digital logic, combinational and sequential circuits, transistors and integrated circuits
- **Unit 2** – Intro to MIPS; MARS; machine code formats; arithmetic, shift and bitwise instructions
- **Unit 3** - Conditional/unconditional branch instructions, repetition, subroutines, arrays