

C-ID Descriptor

Computer Architecture and Organization

Descriptor Details

- **Descriptor Title:** Computer Architecture and Organization
- **C-ID Number:** 142
- **Units:** 3.0
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General Description

The organization and behavior of real computer systems at the assembly-language level. The mapping of statements and constructs in a high-level language onto sequences of machine instructions is studied, as well as the internal representation of simple data types and structures. Numerical computation is examined, noting the various data representation errors and potential procedural errors.

Prerequisites

No information provided

Corequisites

No information provided

Advisories

CS 122

Content

1. Bits, bytes, and words
2. Numeric data representation and number bases
3. Fixed- and floating-point systems

4. Signed and twos-complement representations
5. Representation of nonnumeric data (character codes, graphical data)
6. Representation of records and arrays
7. Basic organization of the von Neumann machine
8. Control unit; instruction fetch, decode, and execution
9. Instruction sets and types (data manipulation, control, I/O)
10. Assembly/machine language programming
11. Instruction formats
12. Addressing modes
13. Subroutine call and return mechanisms
14. I/O and interrupts

Lab Activities

No information provided

Objectives

At the conclusion of this course, the student should be able to:

Write simple assembly language program segments;

Demonstrate how fundamental high-level programming constructs are implemented at the machine-language level;

Evaluation Methods

Exams

Quizzes

Programming Projects

Discussions

Class Presentations

Textbooks

Introduction to Computer Organization with x86-64 Assembly Language & GNU/Linux

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