

COURSE OUTLINE

Computer Science/Information Systems 166 Advanced Computer Architecture and Assembly Language

I. Catalog Statement

CS/IS 166 covers the extension of basic addressing concepts to more advanced address ability such as base register and self-relative addressing, as well as comparative computer architecture focusing on such organizations as multiple register processors and stack machines. Students study the basics of virtual memory input-output and an introduction to the concept of micro programmable systems. Low-level system translation processes associated with assemblers, system functions such as relocatable loading and memory management, applications of data structures, and hashing techniques are covered.

Total Lecture Units: 3.0

Total Laboratory Units: 0.0

Total Course Units: 3.0

Total Lecture Hours: 48.0

Total Laboratory Hours: 0.0

Total Laboratory Hours To Be Arranged: 0.0

Total Faculty Contact Hours: 48.0

Prerequisite: CS/IS 165 or equivalent

II. Course Entry Expectations

Prior to enrolling in the course, the student should be able to:

- utilize assembly language to do operations such as decimal and string I/O;
- apply the assembly language instructions and pseudo operations to create a program;
- create assembly language programs using stacks, arrays, input and output operations and other instructions.

III. Course Exit Standards

Upon successful completion of the required coursework, the student will be able to:

- create a complex computer program in assembly language;
- recognize and explain I/O codes, error-correcting, compression, and encryption;
- explain advanced computer architecture, machine instructions and addressability.

IV. Course Content

Total Faculty Contact Hours = 48.0

- A. Introduction (**3 hours**)
- B. Computer Systems Organization (**6 hours**)
- C. The Digital Logic Level (**6 hours**)
- D. The Microarchitecture Level (**9 hours**)
- E. The Instruction Set Architecture Level (**6 hours**)
- F. The Operating System Machine Level (**6 hours**)
- G. The Assembly Language Level (**9 hours**)
- H. Parallel Computer Architectures (**3 hours**)

V. Methods of Instruction

The following methods of instruction may be used in the course:

- lectures;
- computer demonstrations.

VI. Out of Class Assignments

The following out of class assignments may be used in the course:

- programming assignments (e.g. write assembly language program);
- homework assignments.

VII. Methods of Evaluation

The following methods of evaluation may be used in the course:

- quizzes;
- midterm examinations;
- final examination.

VIII. Textbook(s)

Tanenbaum, Andrew S. and Todd Austin. *Structured Computer Organization*, 6th ed.
Upper Saddle River: Pearson/Prentice-Hall, 2012. Print.
12th Grade Textbook Reading Level. ISBN. 0-13-291652-5

IX. Student Learning Outcomes

Upon successful completion of the required coursework, the student will be able to:

- describe a computer system;
- implement assembly language code for specific applications;
- describe the design and implementation of micro-architecture systems.