

## COURSE DESCRIPTION

**Department and Course Number:** CSCI 223

**Course Title:** Computer Organization and Assembly Language

**Current Catalog Description:** Introduction to the architecture of computer systems. The topics include processor and external device structures and operation, machine operations and instructions, assembly language concepts, and assembly language programming.

**Total Credits:** 3 hours.

**Coordinator:** P. Tobin Maginnis, Associate Professor of Computer and Information Science. Described version was developed by Daniel Dooly, Visiting Assistant Professor of Computer and Information Science.

**Textbook:** Andrew S. Tanenbaum. *Structured Computer Organization*, Fourth Ed. Prentice-Hall, 1999. Jeff Duntemann. *Assembly Language Step-by-Step*, Second Ed. Wiley, 2000.

**Other required materials:** None

**References:** <http://www.cs.olemiss.edu/~drd/csci223/spring02>

**Course Goals:** To provide students with knowledge of system and processor architectures; assembly language; input/output and storage devices and control techniques.

**Prerequisites by Topic:**

1. Knowledge of a high level programming language (CSCI 112)
2. Basic data structures (CSCI 112)

**Major Topics Covered in the Course:**

1. Architecture, implementation, and realization (1 hour)
2. CPU organization and machine execution (4 hours)
3. Intel 8086 and Pentium architecture (3 hours)
4. RAM and binary numbers (2 hours)
5. Disks and caches (3 hours)
6. I/O (3 hours)
7. Digital logic (5 hours)
8. Example buses (3 hours)
9. Instruction decoding (5 hours)
10. Microprogramming (2 hours)
11. Addressing and symmetry (3 hours)
12. Program logic and control (3 hours)
13. Memory management (2 hours)
14. Mixed language programming (1 hour)
15. RISC design issues (2 hours)

**Laboratory projects:**

1. Arithmetic on von Neumann machine simulator (2 weeks)
2. "Hello, world" program in assembler (2 weeks)
3. Comparison of strings in assembler (4 weeks)
4. String lookup assembly language program (4 weeks)

**Estimate of ABET/CAC Category Content:**

	CORE	ADVANCED		CORE	ADVANCED
Data Structures	_____	_____	Computer Organization and Architecture	<u>2</u>	_____
Algorithms	_____	_____	Concepts of Programming Languages	<u>1</u>	_____
Software Design	_____	_____		_____	_____

**Oral and Written Communications**

Not a significant focus of the course.

**Social and Ethical Issues**

Not a significant focus of the course.

**Theoretical Content (Foundations)**

Not a significant focus of the course.

**Problem Analysis**

Laboratory projects 3 and 4 require analysis of the problem in order to design a solution.

**Solution Design**

Laboratory projects 3 and 4 require design of a solution in a high-level language before implementation in assembly language.