TAFTCOLLEGE

Computer Science (COSC) 2000 Computer Architecture and Organization (3 Units) CSU

Prerequisite: none

Prerequisite knowledge/skills: None

Hours and Unit Calculations:
48 hours lecture. 96 Outside of class hours. (144 Total Student Learning Hours) 3 Units

Catalog 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.

Type of Class/Course: Transfer Degree Credit

Text: Patterson, David and Hennessy. *Computer Organization and Design MIPS Edition: The Hardware/Software Interface*. 6th Ed. Morgan Kaufman 2020.

Course Objectives:

By the end of the course a successful student will be able to:

1. Write simple assembly language program segments;
2. Demonstrate how fundamental high-level programming constructs are implemented at the machine-language level.

Course Scope and Content:

Unit I   Numeric Representation
                A. Bits, bytes, and words
                B. Numerical data representation and number bases
                C. Fixed and floating-point systems
                D. Signed and twos-complement representations

Unit II   Non-numeric Representation
                A. Character codes
                B. Graphical data

Unit III   Data Structure Representation
                A. Records

B. Arrays

Unit IV   Computer Hardware and Firmware Representation
        A. Basics organization of the von Neumann machine
        B. Control unit; instruction fetch, decode, and execution
        C. Instruction sets and types (data manipulation, control, I/O)
        D. Stacks and priority calls

Unit V   Programming
        A. Assembly/machine language programs
        B. Development environment
        C. Instruction formats
        D. Addressing modes
        E. Subroutine call and return mechanism

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 6 hours per week outside of the regular classtime doing the following:

1. Studying assigned text, handout materials and class notes
2. Reviewing and preparing for quizzes, midterm and final exams
3. Completing individual homework assignments and projects following coding guidelines and proper documentation.

Methods of Instruction:

1. Lecture, demonstrations and discussions
2. Individual homework and project assignments

Methods of Evaluation:

1. Quizzes
2. Exams
3. Participation
4. Assignments
5. Programming Projects (individual and group)
6. Class Presentations (individual and group)

Supplemental Data:

TOP Code:	070600: Computer Science
SAM Priority Code:	E: Non-Occupational
Distance Education:	Not Applicable

Funding Agency:	Y: Not Applicable (funds not used)
Program Status:	1: Program Applicable
Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not applicable
Cooperative Work Experience:	N: Is not part of a cooperative work experience education program
Eligible for Credit by Exam:	E: Credit By Exam
Eligible for Pass/No Pass:	NO
Taft College General Education:	NONE
Discipline	Computer Science OR Engineering