North Hennepin Community College

CSCI 2020: Computer Architecture

A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: *.*

Lab Hours/Week: *.*

OJT Hours/Week: *.*

Prerequisites:
This course requires the following prerequisite
    CSCI 2001 - Object Oriented Programming (CS1)

Corequisites: None

MnTC Goals: None

As an introduction to computer organization and structure, this course includes beginning machine and assembly language programming. Topics to be covered include logic gates and Boolean algebra, basic elements of computing devices, basic components of a computer, data representation and number systems, micro operations, microprogramming, and input-output programming.

B. COURSE EFFECTIVE DATES: 07/02/2018 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Computer arithmetic, data representation and number systems, addition, subtraction, 1s complement, 2s complement, BCD representation, sequential logic, digital components, beginning assembly language programming, aspects of computer architecture and compilers, memory technology, memory hierarch, caches, disk, locality, high-level and low-level I/O

D. LEARNING OUTCOMES (General)

1. Design and implement simple combinational and sequential logic circuits. (ELO# 1,2)
2. Represent numeric and text data in current standard formats and convert between numeric formats. (ELO# 1,2)
3. Describe instruction execution cycle and how the processor and memory work. (ELO# 1,2)
4. Describe machine instruction formats and discuss features and differences of instruction set formats and architectures. (ELO# 1,2)
5. Write assembly language programs that incorporate standard programming structures, subroutines, I/O and macros. (ELO# 1,2)
6. Describe the memory hierarchy including different levels and optimization strategies such as cache and virtual memory. (ELO# 1,2)
7. Discuss different I/O and storage devices and mechanisms including bus protocols, interrupts, and interfaces. (ELO# 1,2)
8. Discuss concurrency techniques to bypass performance bottleneck including pipelining, superscalar, multi-core, and multi-threading. (ELO# 1,2)
9. List and compare the different architecture categories and describe emerging technologies. (ELO# 1,2)

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

Knowledge of Human Cultures and the Physical and Natural World¿Through study in the sciences, mathematics, social sciences, humanities, histories, languages, the arts, technology and professions.

Intellectual and Practical Skills¿Including: Inquiry and analysis; Critical and creative thinking; Written and oral communication; Quantitative literacy; Information literacy; Teamwork and problem solving.