ROCHESTER COMMUNITY AND TECHNICAL COLLEGE

COMMON COURSE OUTLINE

Course discipline/number/title: COMP 2275: Computer Architecture

A. CATALOG DESCRIPTION

1. **Credits: 4**
2. **Hours/Week: 4**
3. **Prerequisites (Course discipline/number):** COMP 1150, COMP 2243
4. **MnTC Goals (if any):** NA

This course covers the principles of the hardware and computer systems. Topics include combinational and sequential logic circuit, data representation, computer organization and architecture, instruction execution cycle, processor, memory, machine instruction formats, assembly language, I/O and storage devices and mechanisms, concurrency techniques, comparison of different architecture categories, and emerging technologies. College level reading is required.

B. DATE LAST REVISED (Month, year): December, 2017

C. OUTLINE OF MAJOR CONTENT AREAS:

1. Simple combinational and sequential logic circuits
2. Data representation
3. Computer organization and architecture
4. Instruction format and instruction execution cycle
5. Assembly language
6. Memory hierarch
7. I/O and storage devices and mechanisms
8. Concurrency techniques
9. Different architecture categories and emerging technologies

D. LEARNING OUTCOMES (GENERAL): The student will be able to:

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

E. LEARNING OUTCOMES (MNTC): NA

F. METHODS FOR EVALUATION OF STUDENT LEARNING:

Methods may include but are not limited to:

1. Tests
2. Lab exercises
3. Programming assignments
4. Comprehensive final exam

G. RCTC CORE OUTCOME(S) ADDRESSED:

Critical Thinking. Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.

H. SPECIAL INFORMATION (if any): None