A. Course Description

Credits: 4

Prerequisites: ICS 141 Programming with Objects OR equivalent knowledge of Java. AND MATH 215 Discrete Mathematics

Corequisites: None

Lab Hours/ Weeks: None

Lecture Hours/ Week :

MnTC Goals: None

Introduces machine language, digital logic and circuit design, data representation, conventional von Neumann architecture, instruction sets and formats, addressing, the fetch/execute cycle, memory architectures, I/O architectures, as well as hardware components, such as gates and integrated chips.

B. Course Effective Dates: 08/17/2014 - Present

C. Outline of Major Content Areas:

See Course Description for major content areas.

D. Learning Outcomes (General)

1. Analyze error correction algorithms (such as Hamming code) in the design of computer components.
2. Apply Boolean logic and minimizing techniques to design logic circuits.
3. Apply computer architecture concepts to the design of parts of computer systems.
4. Apply knowledge of memory model, instruction sets, addressing modes, and input/output features to develop assembly language programs.
5. Know computer history, types and generations of computers and their application areas, major categories of instruction sets, and the difference between computer organization and computer architecture.
6. Know multiprocessing and alternative architectures.
7. Understand the von Neumann model and explain the communication pathways in a computer system, including data flow through the CPU (interfacing to I/O, bus control logic, and internal communications).
8. Utilize electronic equipment and components to implement and test logic circuits.

E. Learning Outcomes (MN Transfer Curriculum)

This contains no goal areas.

G. Special Information

Note: Students are responsible to both be aware of and abide by prerequisites for ICS courses for which they enroll, and will be administratively dropped from a course if they have not met prerequisites.