Compute Science CSC 320  
Computer Architecture and Organization

Credits and Contact Hours: 3 Credits, Contact Hours: 42 (1 contact hour = 50 minutes)

Instructor: Dr. Brian Krupp


Course Description
a. Catalog description: This course covers computing history, computer technology and terminology, basic logic design, computer architecture, CPU architecture, memory systems and assembly language.
b. Prerequisites: CSC 245 – Data Structures  
c. Required/Elective:  
   a. Computer Science – Required  
   b. Software Engineering – Not Required

Specific Goals of Course
a. Specific outcomes of instruction
   a. This course will provide students a fundamental understanding of how computers work at a lower level.
   b. They will understand the five main components of computer architecture input, output, memory, datapath, and control.
   c. They will learn how to program in assembly language.
   d. They will learn how to write more efficient software, engineer computer systems, and understand computational performance.
   e. They will learn how to design a computer that actually does computation.
   f. They will understand the importance and impact of parallelism and how its incorporated into computer systems.
b. CAC Criterion 3 outcomes addressed by the course:
   a. An ability to apply knowledge of computing and mathematics appropriate to the discipline.
   b. An ability to analyze a problem and identify and define the computing requirements appropriate to its solution
   c. An ability to design, implement, and evaluate a computer-based system, process, component or program to meet desired needs.
   j. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices
   c. EAC Criterion 3 outcomes addressed by the course:
   c. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
e. An ability to identify, formulate, and solve engineering problems.
j. A knowledge of contemporary issues.

Brief List of Topics to Be Covered
a. Computing History
b. Computer Architecture and Organization
c. Digital Logic and Circuits
d. Data Representation
e. Computer Arithmetic
f. Hardware (Memory, CPU Chips, Interfaces)
g. Datapath and Control
h. Pipelining
i. Data and Branch Hazards, Stalls
j. Memory Hierarchy
k. Assembly Language