Course Syllabus

CS 286 Computer Architecture I

Credits: 3

Contact hours: 3

Instructor’s or course coordinator’s name: Cui Yu

**Suggested textbook:** Linda Null and Julia Lobur, The Essentials of Computer Organization and Architecture, Jones and Bartlett. 2011.

**Catalogue Description:**Data representation and operations. Digital logic design. Processor data path. Memory hierarchy. Instruction set architecture. Assembly language programming.

**Prerequisites:** CS 176, passed with a grade of C or higher

Required or selected elective: Required  
  
Specific outcomes of instruction:

By the end of the course, the students will

* Be familiar with the basics of computer system organization and its relationship to fundamental logic components.
* Be able to perform basic arithmetic operations with signed integers represented in binary.
* Be able to analyze and design combinational systems using standard gates, minimization methods (such as Kmaps), and combinational modules (such as multiplexers and decoders).
* Be able to analyze and design simple sequential systems.
* Be able to explain hierarchical memory organization and how each level of memory contributes to system performance.
* Be able to write assembly language program.

Relationship of course to student outcomes listed in outcome criterion:

* Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

**Topics Covered**

* Introduction
* Data Representation
* Boolean Algebra
* Digital Logic (Combinational), K-Map
* Digital Logic (Sequential)
* Basic Computer Organization & Design (MARIE)
* Instruction Set Architecture (MARIE)
* Assembly Programming
* Memory Organization
* More on Instruction Set Architecture