CSE 469 Computer Architecture I

Credits
5.0 (3 hrs lecture, 2 hours meetings)

Lead Instructor
Scott Hauck

Textbook
Patterson, Hennessy, *Computer Organization and Design: The Hardware/Software Interface*, ARM Edition, Morgan Kaufmann, 2017.

Course Description
Advanced techniques in the design of digital systems. Hardware description languages, combinational and sequential logic synthesis and optimization methods, partitioning, mapping to regular structures. Emphasis on reconfigurable logic as an implementation medium. Memory system design. Digital communication including serial/parallel and synchronous/asynchronous methods.

Prerequisites
CSE 143, CSE 369.

CE Major Status
Selected Elective

Course Objectives
Learning Objectives: At the end of this course students will be able to:
Write simple assembly language programs.
Identify the major components of a microprocessor.
Design a microprocessor that supports a given instruction set.
Analyze microprocessor performance, including cache memory systems.
Demonstrate understanding of modern microprocessor features.

ABET Student Outcome Coverage: This course addresses the following outcomes:
H = high relevance, M = medium relevance, L = low relevance to course.
(1) *An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics* **(H)**
(2) *An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors* **(M)**
(6) *An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions* **(M)**
(7) *An ability to acquire and apply new knowledge as needed, using appropriate learning strategies* **(L)**

Topics:
Introduction to processor architecture. Performance measures.
Assembly language programming.
Computer arithmetic.
Processor datapaths, control.
Pipelining.
Memory hierarchy, caches.
Advanced topics in computer architecture: ILP, VLIW, Superscalar