Catalog Description: Presents the relationship between computing hardware and software with a focus on the concepts for current computers. CPU design topics are covered including various techniques for microprocessor design and performance evaluation. Corequisite: Lab component.

Prerequisite: CSCE 2114 with a grade of C or better.


Goals: A basic understanding of computer organization. The ability to analyze and design an ISA and pipelined microprocessor. The ability to analyze a memory hierarchy.

Topics Covered:
• Computer Abstractions and Technology
• Arithmetic and ALU Design
• ISA Design and Encodings
• Logical/Control Flow and Addressing Modes
• Stacks, Calling Conventions, Arrays & Pointers
• Data Path Design
• Pipelining and Hazards
• Introduction to Memory Hierarchies and Caches
• Virtual Memory

Class/Laboratory Schedule:
• 3 lectures per week from 9:40am to 10:30am in JBHT 144
• 6 lab sessions

Instructor: Dr. Jia Di (jdi@uark.edu)
Office: JBHT 523
Office Hour: 10:30am to 11:30am MWF
Course Website: http://comp.uark.edu/~jdi/CSCE2214.htm

TA: Franck Yonga (yfrancku@email.uark.edu), Nicolas Edwards (nedwards@email.uark.edu)
  TA Office: JBHT 434
  TA Office Hours:
    Franck Yonga (Monday Tuesday Wednesday 10:00am – 11:30am)
    Nicolas Edwards (Monday 11:00am – 12:30pm, Tuesday 2:15pm – 3:45pm)

Grading: Midterm Exam (2): 15% each; 30% in total
          Final Exam: 25%
          Homework: 15%
          Lab Projects: 30%
Relationship of course to Computer Engineering Program Student Outcomes:

- (a) An ability to apply knowledge of mathematics, science, and engineering.
- (b) An ability to design and conduct experiments, as well as to analyze and interpret data.
- (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.
- (i) A recognition of the need for, and an ability to engage in life-long learning.
- (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Relationship of course to Computer Science Program Student Outcomes:

- (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.
- (h) Recognition of the need for and an ability to engage in continuing professional development.
- (i) An ability to use current techniques, skills, and tools necessary for computing practices.
- (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.