Instructor: Dr. Fengguang Song, Office: SL 275, Phone: 317-274-7265, Email: fgsong@iupui.edu
Office Hours: Tuesday 4:20-6:20 PM, or by appointment.

TAs: Hao Wang (hw52@iu.edu, 317-734-5933, Lead TA); Bo Peng (peng10@iu.edu)
TA Office: SL 228
Office Hours: Monday 4:00-5:00pm and Wednesday 4:00-5:00pm, or by appointment.


Course Website: http://cs.iupui.edu/~fgsong/csci402

Prerequisites: CSCI 340 or Instructor’s permission

Course Description
As a computer science student, you will have to understand the underlying computer architectures in order to write efficient programs and software. Without knowing the hardware and the architecture, the best program you can write is a working “dummy” version.

This course introduces the basics of computer organizations and architectures. It covers a list of essential computer architecture concepts such as computer performance, instruction set, basic logic design, computer arithmetics, floating points operations, pipeline, multicore processors, memory, cache, parallel processing, and GPGPU.

Course Objective
In this course, you will be able to understand the basics of computer architectures. You will learn how to design a computer system, understand how a computer system works and why it works as it does. This course will provide you with critical knowledge and prepare you to become a good software designer no matter whether you are working on domain applications, operating systems, big data, compilers, algorithms, databases, back-end servers, or parallel applications.

Tentative Course Topics
- Computer abstractions, instruction sets .................................................. January
- Basic logic design, arithmetics for computers ........................................... February
- Processors, multicore ................................................................. March
- Memory, cache, parallel processing and GPU ........................................ April
Requirement and Grading
The course grade will be determined as follows:

- Class participation (10%, with up to 3 bonus points for student leads or active students)
- Written homework (one per chapter, 10%)
- Programming homework (one per chapter, 10%)
- Pop quizzes (10%)
- Midterm exam (30%)
- Final exam (30%) (non-cumulative)

Rationale behind the CS402 homework and quizzes:

- The purpose of assigning written homework is to prepare you for the midterm and final exams. If you don’t know how to solve homework questions, it is very likely you will not pass the exams.
- The purpose of assigning programming homework is to give you opportunities to practice what you have learned in class, and enhance your understanding of computer architectures.
- The purpose of the pop quizzes is to let the professor know your progress and engage you to review lecture slides frequently. Also they will help you get familiar with the types of questions in your upcoming exams.

Grading of labs:
8 points for the source code (classified into 4 levels) and 2 points for the 1-page report.

- Level 1: Code has been implemented, but TA cannot compile the code correctly → 3 points
  //based on running your makefile
- Level 2: Can compile, but when running, cannot complete normally (e.g., segmentation faults, exceptions, etc.) → 4 points
- Level 3: Can compile and run with correct results → 6 points
- Level 4: Can compute correct results, and your program performance is reasonable → 8 points
For the 1-page report: show your experimental results in figures; explain the figure and provide insights and/or conclusions.

Due Dates, Times, and Policies
You should SCAN and submit your homework to TA through the Canvas website. The typical due date and time is 11:59:59PM either on Monday or Wednesday. You will have one or two weeks to finish the homework.

Note: No late homework will be accepted and there will be no makeup exam, unless you notify the instructor in advance about your extreme situation.

Academic Misconduct
As an IUPUI student, you have agreed to abide by the Code of Students Rights, Responsibilities, and Conducts. You must uphold and maintain academic and professional honesty and integrity. The following link defines students’ responsibilities: [http://studentcode.iu.edu/responsibilities](http://studentcode.iu.edu/responsibilities)

Cooperation and Cheating
Students can help each other to understand the course materials and understand the homework. However, copying other people’s solution (including quizzes, homework, and exams) is definitely cheating.

Disruptive Student Conduct Procedures
Disruptive conduct is defined as:

a. Posing a significant threat of danger and/or harm to oneself or to other members of the university community.

b. Unreasonably interfering with the rights of other students, staff, and/or faculty of the University, or with the exercise of any activity or function of the University.

For example, “Behavior which is disorderly, lewd or indecent, or a breach of the peace, or the aiding, abetting, or procuring another person to breach the peace on University premises.”

CS Department’s Policy against Academic Cheating
The policy against violations of academic integrity will be enforced at our departmental level across multiple courses: (1) If a student does not abide by this policy then for the first violation, he/she will receive zero point for that component of the course and will be reported to the Department Chair; (2) For the second violation of academic integrity (even in a different course), the student will receive a FAIL grade for the course and, in addition, an official reporting process will be initiated as per IUPUI's Student Conduct Policies that can be found here: [http://www.indiana.edu/~code/code/responsibilities/academic](http://www.indiana.edu/~code/code/responsibilities/academic)

University Attendance Policy: [http://registrar.iupui.edu/withdrawal-policy.html](http://registrar.iupui.edu/withdrawal-policy.html)
A basic requirement of this course is that you will participate in all class meetings and conscientiously complete all required course activities and/or assignments. Keep in touch with me if you are unable to attend, participate, or complete an assignment on time.
If you miss more than four classes in the first four weeks, you may be administratively withdrawn from this course. Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal will take place after the full refund period, and if you are administratively withdrawn from the course you will not be eligible for a tuition refund. If you have questions about the administrative withdrawal policy at any point during the semester, please contact me.

Adaptive Educational Services (AES) Policy (http://aes.iupui.edu): Students needing accommodations because of disability will need to register with Adaptive Educational Services and complete the appropriate forms issued by AES before accommodations will be given. The AES office is located in Taylor Hall, UC 100. You can also reach the office by calling 274-3241.

Important Dates:

- First class .................................................. Jan 07
- Midterm exam ................................. In class on Tuesday, March 05
- Withdraw with automatic W ............................ March 10
- Last class .......................................................... April 25
- Final exam ................................. 3:30pm-4:45pm on Thursday, May 2