CDA5155/CDA4150 Computer Architecture
General Information
Spring 2026

Instructor: David Whalley
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Office Hours: 1:00pm-2:30pm Tuesday and Thursday

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Office Hours: 3:00pm-4:30pm Tuesday

Prerequisites: CDA3100 (Computer Organization), COP4530 (Data Structures) recommended

Text: J. Hennessy and D. Patterson. *Computer Architecture A Quantitative Approach. Sixth Edition.*

Zoom Meetings: I will hold meetings with students (either within or outside of office hours) either in person or remotely over zoom at https://fsu.zoom.us/j/91417108443. I will open a zoom session if you contact me through e-mail or call me on my office phone. I will use the same URL to provide a zoom lecture when students provide a legitimate reason for being unable to attend class.

Class Homepage: The class home page is at http://www.cs.fsu.edu/~whalley/cda5155.html. The page will contain a variety of information, which will include the syllabus, schedule, slides, and assignments.

Course Objectives: A student who has completed this course with a passing grade should be able to:

(1) Calculate architecture performance measures.

(2) Determine the hits and misses in various memory hierarchy levels for a sequence of address references given a specified configuration.

(3) For various memory hierarchy optimizations, list the likely impact on miss rate, miss penalty, and hit time.

(4) Detect pipeline dependences and hazards for a sequence of assembly instructions.

(5) Apply basic assembly code transformations by hand to increase instruction-level parallelism.

(6) Determine for a sequence of instructions the cycle when each instruction will go through each stage of an out-of-order pipeline.

(7) Determine for a sequence of instruction address references whether or not each instruction will hit in a branch target buffer and the prediction that will be made in a branch prediction buffer for specified configurations.

(8) Transform an assembly loop to exploit SIMD instructions.

(9) Identify the advantages and disadvantages of architectures that support data and thread-level parallelism.

(10) Describe the benefits and challenges of warehouse-scale computing.

(11) Describe guidelines that can make domain-specific architectures (DSAs) cost effective.

(12) Write a short paper on a topic in computer architecture.

Slides: There is a lot of material to cover in this class. Lecturing from slides will allow me to cover the material at a more rapid pace. I will be presenting slides that I have developed and slides of figures and tables from the text. These slides will be made available from the class homepage prior to their presentation.

Assignments: You will be assigned three programming projects, some other exercises, and a paper to write. The

programming projects together required about 1250 lines of code for my solutions. The paper you will write will be on some computer architecture survey topic. There may also be papers on computer architecture that you will be assigned to read. All assignments are to be individually accomplished by each student.

Grading: There will be three exams (60% of total) and various projects (40% of total). Keep all graded material to provide evidence of grades. A final comprehensive exam may be given in place of the third exam.

Attendance and Punctuality: You are responsible for all material presented in class. Exams and due dates will be scheduled in advance. A grade of zero will be recorded for missed exams and late assignments unless prior arrangements are made or the absence is excused. Assignments turned in after the due date, but by the beginning of the next scheduled class will be penalized 10%. Assignments will not be accepted that are more than one class period late.

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Cheating: Students are allowed to discuss assignments in general and to help one another find bugs in existing programs. Copying some other person's code or writing code for someone else is cheating. Working together on any assignment is not allowed. Keep listings to provide evidence of creative development.

Class Behavior: Students are expected to refrain from carrying on side conversations or other distracting behavior in class. Violations of this policy will result in expulsion from the classroom.

Academic Honor Policy: The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "... be honest and truthful and ... [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at http://fda.fsu.edu/academic-resources/academic-integrity-and-grievances/academic-honor-policy.)

Americans with Disabilities Act: Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Student Disability Resource Center; and (2) bring a letter to the instructor indicating the need for accommodation and what type. Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from the Student Disability Resource Center has been provided. This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center
97 Woodward Avenue, South
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
sdrc@admin.fsu.edu
http://www.disabilitycenter.fsu.edu/

Syllabus Change Policy: Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.