Introduction to Computer Organization
CDA 3101
Class Periods: MWF Period 9
Location: TUR 7
Academic Term: Fall 2025

Instructor:
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Course Description
This course focuses on the organization of computing systems. In this course, you will learn about:
- Organization of computing systems.
- Logical basis of computer structure.
- Machine representation of instructions and data, flow of control, and basic machine instructions.
- Assembly language programming.

Course Pre-Requisites / Co-Requisites
To take this course, you must have completed the following courses:
- COP 3504 or COP 3503
- MAC 2233, MAC 2311 or MAC 3472
- COT 3100

Course Student Learning Outcomes
By the end of this course, you will be able to:
1. Calculate computer performance.
2. Represent simple high level language programs in RISC-V.
3. Represent RISC-V assembly language instructions in binary machine instructions.
4. Describe and demonstrate the use of stack frames for saving local variables.
5. Represent integers and floating-point numbers in binary.
6. Trace the execution of RISC-V instructions through simple single cycle and pipelined datapaths.
7. Distinguish between direct mapped, set associative, and fully associative cache designs.

Materials and Supply Fees
None

Required Textbooks and Software

Computer Organization and Design RISC-V Edition: The Hardware Software Interface (The Morgan Kaufmann Series in Computer Architecture and Design) 1st Edition
Patterson and Hennessy

- qemu
- iClicker
- GradeScope

Required Computer

Recommended Computer Specifications: https://it.ufl.edu/get-help/student-computer-recommendations/

HWCOE Computer Requirements: https://www.eng.ufl.edu/students/advising/fall-semester-checklist/computer-requirements/

Recommended Materials

Zybooks
1. Sign in or create an account at learn.zybooks.com
2. Enter zyBook code: UFLCDA3101ReschFall2025
3. Subscribe

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
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	Low
3. An ability to communicate effectively with a range of audiences	
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	High

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	High

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Course Schedule

Week / Dates	Topic	iClickers (33)	Reading	Zybooks Assignments (27)	Assignment Due
1-2 8/22, 25, 27, 29	Introduction, ISAs, Performance Equation, Benchmarking	2	1.1-1.6	3	
3 - 9/3, 5	Signed Integers, Instruction basics	2	2.4	1	
4 – 9/8, 10, 12	arithmetic instructions, data transfer instructions, decisions and loops	3	2.1-2.3, 2.6, 2.7	4	Programming Assignment 1A – Sept 11
5 – Sept 15, 17, 19	Arrays, strings, memory model, exam 1 review	3	2.9, 2.14	1	Programming Assignment 1B – Sept 18
6 – Sept 24, 26	Procedures	2	2.8	1	Exam 1 – Sept 22 Programming Assignment 1C – Sept 25
7 – Sept 29, Oct 1, 3	Recursion, Buffer overflow	3			Programming Assignment 2A
8 Oct 6, 8, 10	Floating Point, Multiplication, Digital Logic	2	3.1, 3.2, 3.3, 3.5	3	Buffer Overflow Assignment
9 Oct 13, 15	Circuit Basics Constructing an ALU	2	8.1, 8.2, 8.3, 8.5, 8.7, 8.8	1	Programming Assignment 2B
10 Oct 20, 24	Exam review, Machine code, Building a data path	2	2.5 4.1, 4.2	2	Exam 2 Oct 21 (Tues)
11 Oct 27, 29, 31	Single cycle, pipelining	3	4.3-4.9	4	
12 Nov 3, 5, 7	Cache	2	5.1-5.4	3	
13 Nov 10, 12, 14	Cache coherence, virtual memory	3	5.7, 5.10	2	Cache analysis project
14 Nov 17, 21	Exam review, parallel processing	2		1	Exam 3 Nov 19

15 Dec 1,3	Final exam review	2			Final exam Dec 10 5:30-7:30

Attendance Policy, Class Expectations, and Make-Up Policy

Exams and Final Exam

Exams are taken in the assigned classroom. Students may use one printed or hand written reference sheet.
Exams are taken on paper and uploaded to GradeScope.
Students with accommodations allowing them extra time should schedule their exam in the DRC.
Make up exams are offered for those with university-approved excused absences.

Participation Grade

There are 33 iClicker activities and 27 Zybooks activities, for a total of 60 participation activities. 30 of the 60 will count in your participation grade. Zybooks activities may not be turned in late, and iClicker activities will not be excused.

Late Policy

Programming Assignments, Cache Analysis Assignment, and Buffer Overflow Assignment may be turned in up to four days late with a late penalty of 10 points per day.

Honesty Policy

Your code for your Programming Assignments and the Analysis Assignments must be your own. You may discuss assignments with others, but **copy/pasting code from other students or online resources is strictly prohibited**. We will be using TurnItIn to check for plagiarism.
Your writing and graphs for the Cache Analysis Assignment must be your own. **Copy/pasting writing and/or graphs from other students is strictly prohibited.**
You may discuss and draw out algorithms for the assignments with other students. You may not copy code from another student. You may not copy AI generated output. You may not copy code from the internet.
A sanction of an E in the course will be imposed if a student is found to have violated the honesty policy.

Discussion of Grades

Grades on any assignment may be discussed with me via email or in office hours up to **seven days after the grade was released**.

Etiquette Expectations

Please communicate in a professional manner in email, on Discord, and in Canvas Discussions.

Evaluation of Grades

We will make every effort to have each assignment graded and posted within one week of the due date.

Course Grading Policy

Assignment	**Points**
Exams (3)	30%
Final Exam	10%
Programming Assignments	30%
Buffer Overflow Assignment	10%

Assignment	Points
Cache Analysis Assignment	10%
Participation Activities (40 with 13 drops)	10%
Total	**100%**

Grading Scale

Percent	Grade	Grade Points
93 - 100	A	4.00
90.0 - 92.99	A-	3.7
87 - 89.99	B+	3.3
83 - 86.99	B	3.00
80.0 - 82.99	B-	2.7
77 - 79.99	C+	2.3
73 - 76.99	C	2.00
70.0 - 72.99	C-	1.7
67 - 69.99	D+	1.3
63 - 66.99	D	1.00
60.0 - 63.99	D-	0.7
0 - 59.99	E	0.00

More information on UF grading policy may be found at:
https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Academic Policies & Resources

To support consistent and accessible communication of university-wide student resources, instructors must include this link to academic policies and campus resources: https://go.ufl.edu/syllabuspolicies. Instructor-specific guidelines for courses must accommodate these policies.

Commitment to a Positive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values.

If you feel like your performance in class is being impacted, please contact your instructor or any of the following:
• Your academic advisor or Undergraduate Coordinator
• HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
• Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu