

Introduction to Computer Organization

CDA3101, Section 1678, 6691, 6692, 6703

Class Periods: MWF, 2, 8:30-9:20am

Location: CAR 100

Academic Term: Fall 2018

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Instructor:

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Office Hours: M 3-4pm, W 2-3pm, F 10-11am

TAs:

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TA Office Hours (Location: E309/E312)

Periods	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1 7:25am-8:15am							
2 8:30am-9:20am	Class		Class		Class		
3 9:35am-10:25am	Kazi (E312)						
4 10:40am-11:30am							
5 11:45am-12:35pm		Hugh (E309)	Jason (E114)	Hugh	Daniel		
6 12:50pm-1:40pm			Jason (E309)				
7 1:55pm-2:45pm		Kathleen		Kathleen			
8 3:00pm-3:50pm	Jonathen	Randy (E312)			Jonathen		
9 4:05pm-4:55pm	Yinghan				Yinghan		
10 5:10pm-6:00pm							
11 6:15pm-7:05pm							Kazi (E113)
E1 7:20pm-8:10pm			Kazi (E113)				
E2 8:20pm-9:10pm							

E3	9:20pm-10:10pm							
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Course Description

3 credits, 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. (M)

Course Pre-Requisites / Co-Requisites

COP 3504 or COP 3503; and MAC 2233, MAC 2311 or MAC 3472.

Course Objectives

By the end of the course students will be able to:

- Compare the performance of different computers
- Create and execute a ARM assembly language program
- Demonstrate algorithms for and hardware for arithmetic with binary numbers representing integers and floating point numbers
- Articulate the difference between single cycle, multi-cycle and pipelined data paths and reasons for choosing an implementation
- Understand memory hierarchy and the use of cache and virtual memory.

Professional Component (ABET):

(a) an ability to apply knowledge of mathematics, science, and engineering

(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

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Relation to Program Outcomes (ABET):

Outcome	Coverage*
a. Apply knowledge	High
b1. Conduct experiments	
b2. Statistical design of experiments	
c. Design	High
d. Function on teams	
e. Solve problems	High
f. Professional and ethical responsibility	Low
g. Communicate	
h1. Economic impact	Low
h2. Global, societal, and environmental impact	
i. Lifelong learning	
j. Contemporary issues	Low
k. Techniques, skills, and tools for degree program	High

Required Textbooks and Software

- Title: Computer Organization and Design: The Hardware/Software Interface, ARM Edition
- Author: Patterson and J. Hennessy,
- Publication date and edition: 1, 2016
- ISBN number: 978-0128017333

OR

Zybooks edition

1. Sign in or create an account at learn.zybooks.com
2. Enter zyBook code: UFLCDA3101ReschFall2018
3. Subscribe

Required Hardware

Firefly ROC-RK3328-CC 2GB

MicroUSB cable for charging

MicroSD cards

Attendance Policy, Class Expectations, and Make-Up Policy

Exams are given in the lecture hall and require the use of Respondus Lockdown Browser.

Exams may be made up when student has an excused absence.

Excused absences must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx> ([Links to an external site.](#))[Links to an external site.](#)) and require appropriate documentation.

Programming Assignments may be turned in late with a penalty of 10% per day up to 4 days late.

Quizzes are given during the discussion period and may not be made up.

Questions on grading of Exams, Quizzes and Programming Assignment must be brought up within 1 week of receiving a grade. After 1 week, the grade is set.

Evaluation of Grades

Assignment	Percentage of Final Grade
Quizzes	20%
Programming Assignments (3)	30%
Midterm Exam 1	15%
Midterm Exam 2	15%
Final Exam	20%
	100%

Extra Credit: up to 5% extra credit for participating in class via TopHat.

TopHat costs \$20/semester (no matter how many classes).

Join code 461061.

Grading Policy

Percent	Grade	Grade Points
93 - 100	A	4.00
90.0 – 92.9	A-	3.67
87 - 89.9	B+	3.33
83 - 86.9	B	3.00
80.0 – 82.9	B-	2.67
77 - 79.9	C+	2.33
73 - 76.9	C	2.00
70.0 – 72.9	C-	1.67
67 - 69.9	D+	1.33
63 - 66.9	D	1.00
60.0 – 62.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx> (Links to an external site.)
[Links to an external site.](#)

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals> ([Links to an external site.](#))[Links to an external site.](#). Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/> ([Links to an external site.](#))[Links to an external site.](#).

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see:

<http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html> (Links to an external site.)
[Links to an external site.](#)

Campus Resources:

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Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc> (Links to an external site.)
[Links to an external site.](#), and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or
<http://www.police.ufl.edu/> (Links to an external site.)
[Links to an external site.](#)

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Academic Resources

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E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml> (Links to an external site.)Links to an external site..

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/> (Links to an external site.)Links to an external site..

Library Support, <http://cms.uflib.ufl.edu/ask> (Links to an external site.)Links to an external site.. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <https://teachingcenter.ufl.edu/> (Links to an external site.)Links to an external site..

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/> (Links to an external site.)Links to an external site..

Student Complaints Campus:

https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf (Links to an external site.)Links to an external site..

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process> (Links to an external site.)Links to an external site..

CDA3101: Introduction to Computer Organization, Fall 2018

Date	Topic	Readings	Assignment
Aug 22, 24	Technology Background, Computer Performance	Chapter 1.5-1.12	
Aug 27, 29, 31	Digital Logic Review	Appendix A	Quiz 1 – Computer Performance
Sept 5, 7	ARM Instruction Set Architecture	2.1-2.3, 2.19	Quiz 2 – Digital Logic
Sept 10, 12, 14	ARM Instruction Formats	2.5-2.7	
Sept 17, 19, 21	Integer Number Systems, Integer Addition and Subtraction	2.4, 3.1-3.2	Quiz 3 – ARM Instruction Formats
Sept 24, 26, 28	Multiplication, Division, Floating Point	3.3-3.5	No class Sept 26
Oct 1, 3, 5	Datapath Design, Single Cycle Datapath		Quiz 4 – Integer Number Systems and Arithmetic Programming Assignment 0.5 Due October 4
Oct 8, 10	Review, Exam 1		Exam 1 Oct 10
Oct 15, 17, 19	Pipelined Datapath	4.5	Programming Assignment 1 Due Oct 21
October 22, 24, 26	Pipelined Hazards and Forwarding	4.6-4.7	Quiz 5 – Pipelined Datapath
October 29, 31	Branch Prediction	4.8	
Nov 5, 7, 9	Memory and Cache	5.1-5.4	Quiz 6 – Memory and Cache
November 14, 16	Review, Exam 2		Exam 2 Nov 16
November 26	Virtual Memory	5.7	No class Nov 19

November 28, 30 Parallel Processing 6.1-6.6

December 3, 5 Review

Programming
Assignment 2 Due
Nov 26

Quiz 7 – Virtual
Memory

Optional
Programming
Assignment 3 Due
December 3

Final Exam 12/12 3-
5 pm