Course Syllabus

Introduction to Computer Organization

CDA3101

Class Periods: Tu 8-9, Th 9

Location: CAR 100

Academic Term: Spring 2019

Instructor:

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Office Location: CSE E508

Office Hours: Mondays 2pm-3pm, Thursdays 5pm-6pm or by appointment.

TAs:

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TA Office Hours (Location: E309/E312)

	Monday	Tuesday	Wed	Thursday	Friday	Sunday
2 8:30-9:20						
3 9:35-10:25		Audrey		Brandon		
4 10:40-11:30	Paul	Audrey	Hugh	Quade	Hugh	
5 11:45-12:35	Paul, Randy	Jon	Randy	Quade	Randy	Kazi (Dungeon)
6 12:50-1:40	Tyler		Tyler	Boris		Kazi (Dungeon)
7 1:55-2:45	Tyler	Patriel	Tyler	Boris		Kazi (Dungeon)
8 3-3:50	Jon	*Class*	Jon	Ying(Dungeon)		
9 4:05-4:55	Jason	*Class*	Katie / Patriel	*Class*	Katie	
10 5:10-6:00	Jason	Brandon	TA Meeting (5PM)	Quade		
11 6:15-7:05				Quade		

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: UFLCDA3101ReschSpring2019
3. Subscribe

Required Hardware

Firefly ROC-RK3328-CC 2GB

MicroUSB cable for charging

MicroSD cards

Ethernet Connector

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is not required, but is highly encouraged. An excellent strategy for doing well in the class is to attend lecture.

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.

Communication:

Every effort will be made to communicate all necessary information via Canvas. There will also be communications made in lecture. If something is said in lecture, it is considered to be communicated to the class. Therefore, if you miss class you may miss information.

The instructor will answer emails. However, emails that ask a question directly addressed in class or on Canvas may not be answered.

There will be a slack channel created for the class. It is forbidden to post code into the slack channel. The existence of a slack channel does not mean that TAs or the instructor will be available all the time. TAs and the instructor will be available often, but not all the time.

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%

Programming Assignments

Programming assignments must be written in ARM. The use of C++ libraries is prohibited except as indicated in the assignment. (For example, the use of printf and scanf is acceptable). Using gnu or any other compiler or tool to convert C++ to ARM is strictly forbidden. We will look over your code for the telltale signs of ARM code that has been produced by a compiler.

You may consult instructors, TAs, friends and any other resources to write your code, but the code must be your own.

When you turn in code, you must turn in a version with a .s extension AND a version with a .txt extension. Turnitin will be used to compare all .txt files to each other to ensure the work is unique.

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

Quizzes

There are 7 quizzes given in discussion period and 2 "do at home" quizzes. **Quizzes given in discussion cannot be made up**. Two quizzes can be dropped. Thus, you have two times when you can miss a discussion quiz.   In case of a conflict, with prior notice you may attend another discussion section.

Exams

Exams are given in the lecture hall and require the use of Respondus Lockdown Browser. Exams may not be made up except for a University approved excuse. Exam 1 and 2 are given during the lecture period (Tu 8-9). The Final Exam is May 1 7:30-9:30am.

TopHat Extra Credit

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

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

Join code721499

I will take attendance using location services.   You must consent to TopHat accessing your location in order to receive credit. The point of this is class participation. To participate, the student must be in the room listening to the lecture.

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.

Commitment to a safe and inclusive learning environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination.

It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@ufl.edu

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

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:

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.](http://www.counseling.ufl.edu/cwc), 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.](http://www.police.ufl.edu/).

Academic Resources

E-learning technical suppor*t*, 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.](https://lss.at.ufl.edu/help.shtml).

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.](https://www.crc.ufl.edu/).

Library Support, [http://cms.uflib.ufl.edu/ask (Links to an external site.)Links to an external site.](http://cms.uflib.ufl.edu/ask). 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.](https://teachingcenter.ufl.edu/).

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..

Date	Topic	Readings	Assignment
Jan 8	Technology Background, Computer Performance	Chapter 1.5-1.12	
Jan 10, 15	Digital Logic Review	Appendix A	
Jan 17, 22	ARM Instruction Set Architecture ARM Instruction Formats	2.1-2.3, 2.19	Quiz 1 – Computer Performance, Jan 16, 17
Jan 22, 24	Integer Number Systems, Integer Addition and Subtraction	2.4, 3.1-3.2	Quiz 2 – Digital Logic Jan 23, 24
Jan 29, 31	Multiplication, Division, Floating Point	3.3-3.5	Quiz 3 – ARM Instruction Formats, Jan 30, 31
Feb 5, 7, 12	Programming in ARM	2.5-2.7	
Feb 14, 19	Datapath Design, Single Cycle Datapath		Quiz 4 – Integer Number Systems and

Date	Topic	Reading	Notes
			Arithmetic, Feb 13, 14
			Programming Assignment 1, Due Feb 17
Feb 21	Review		
			Exam 1 Feb 26
Feb 26	Exam 1		
			No class Feb 28
Mar 12-14	Pipelined Datapath	4.5	Programming Assignment 2, Due March 17
Mar 19-21	Pipelined Hazards and Forwarding	4.6-4.7	Quiz 5 – Pipelined Datapath, Mar 20, 21
Mar 21	Branch Prediction	4.8	
Mar 26, 28, Apr 2	Memory and Cache	5.1-5.4	Quiz 6 – Memory and Cache, Apr 3, 4
April 4	Review		
April 9	Exam 2		Exam 2 April 9
April 11, 16	Virtual Memory	5.7	Programming Assignment 3, Due April 14
April 18	Parallel Processing	4.10, 6.1-6.6	Quiz 7 – Virtual Memory, Apr 17, 18
April 23	Review		
May 1	Final Exam		Final Exam 5/1 7:30-9:30 am
			CAR 100