Digital Logic and Compute Systems

EEL 3701C

Class Periods: MWF, Period 3 (9:35 AM - 10:25 AM)

Location: CSE A101

Academic Term: Fall 2022

Instructor:

Dr, Christophe Bobda, cbobda@ece.ufl.edu, 352 294 2024

Class: MWF, Period 3, 09:35AM - 10:25AM

The classes are taught face-to-face and broadcasted simultaneously, interactive on Zoom.

Zoom-URL: https://ufl.zoom.us/j/95736453697?pwd=TllTK3NVM1R4NXF3MnNwM1ZjbVhSUT09

Students are expected to wear a mask in the classroom.

Students attending over zoom must have a camera on for the entire duration of the class.

Office Hours, online only: MWF, 12:00PM - 1-00PM:

Zoom URL: https://ufl.zoom.us/j/91974630587?pwd=UUNBeDl5ZnUyNDlNaVpyWHNKR3R5dz09

Passcode: 264874

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Please contact through the Canvas website

- Supervise Teaching Students:

Peer Instructors (PI):

Name	Bustamante Sergio (BuS)	Chacon Andrea (CA)	Chang Evan (CE)
e-mail	sbustamante@ufl.edu	andrea.chacon@ufl.edu	evanchang@ufl.edu
Name	Chen Kevin (CK)	Chen Manning (CM)	Chowdhury Arman (ChA)
e-mail	k.chen1@ufl.edu	manningchen@ufl.edu	armanchowdhury@ufl.edu
Name	Cohen Jarid (CJ)	Cusolito Richard (CR)	Giordano Conner (GR)
e-mail	jaridcohen@ufl.edu	richardcusolito@ufl.edu	c.giordano@ufl.edu
Name	Itzep Enemias (IE)	Paul Paulwin (PP)	Sheehan Anna (SA)
e-mail	eitzep@ufl.edu	paulp@ufl.edu	annasheehan@ufl.edu
Name	Shen Matthew (SM)	Shultz Sarah (SS)	Vokoun Steven (VS)
e-mail	matthew.shen@ufl.edu	schultzsarah@ufl.edu	vokoun.steven@ufl.edu

Exercises/Lab Sections: Room NEB 248

Monday			Tuesday			Wednesday			Thursday			Friday		
Sec	Start	PI	Sec	Start	PI	Sec	Start	PI	Sec	Start	PI	Sec	Start	PI
	9:35 AM		11819	9:35 AM	SS		9:35 AM		11924	9:35 AM	SA		9:35 AM	
	11:45 AM		11923	11:45 AM	SS	11840	11:45 AM	ChA	11839	11:45 AM	SM	11841	11:45 AM	CE
11918	1:55 PM	CR	11921	1:55 PM	CA	11919	1:55 PM	CJ	11838	1:55 PM	VS	11920	1:55 PM	IE
11822	4:05 PM	SA	11818	4:05 PM	IE	11917	4:05 PM	CJ	11922	4:05 PM	VS	11817	4:05 PM	GR
11815	6:15 PM	CK	11894	6:15 PM	PP	11895	6:15 PM	BuS	11821	6:15 PM	CK		5:10 PM	
	8:20 PM		11816	8:20 PM	PP		8:20 PM		11896	8:20 PM	CM		8:20 PM	

PI Office Hours: Online-Link for every will be provided on canvas

Periods		Monday	Tuesday	Wednesday	Thursday	Friday
1	7:25 AM – 8:15 AM					
2	8:30 AM – 9:20 AM		CR		SA	CR
3	9:35 AM – 10:25 AM	CJ		VS		
4	10:40 AM – 11:30 AM		SM			
5	11:45 AM – 12:35 PM					
6	12:50 PM – 1:40 PM		ChA	BuS		
7	1:55 PM – 2:45 PM	CM		CA		CE
8	3:00 PM – 3:50 PM	CA		CR		
9	4:05 PM – 4:55 PM	GR	PP			
10	5:10 PM – 6:00 PM	SS	PP		CK	

Course Description
Overview of logic design, algorithms, computer organization and assembly language programming and computer engineering technology. Laboratory. Credits: 4.

Course Pre-Requisites / Co-Requisites
Knowledge of a programming language is helpful but not mandatory.

Course Objectives
- To learn the fundamentals of logic design and optimization
- To learn the design and optimization of combinational and sequential circuits
- To understand the components of register transfer and their application in computer design
- To understand the organization and operation of existing computing systems, including general purpose, single purpose datapath with wired or microprogrammed controllers
- To learn assembler programming, instruction set architectures and approaches to design and optimized general purpose processors

Materials and Supply Fees
List if applicable

Relation to Program Outcomes (ABET):
The table below is an example. Please consult with your department's ABET coordinator when filling this out.

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	High
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	

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

Required Textbooks and Software

Fundamentals of Logic Design 7th Edition, by Jr. Charles H. Roth, Larry L Kinney, Eugene B. John, Cengage Publishing. ISBN-13: 978-1133628477, ISBN-10: 1133628478

The Analog Discovery (DAD) board is REQUIRED for this course (and many other ECE courses). The DAD2 is available at the UF bookstore (attached to the Reitz Union) for just $279. Students can buy it directly from Digilent, but to get the good price they will need to register: http://store.digilentinc.com/analog-discovery-2-100msps-usb-oscilloscope-logic-analyzer-and-variable-power-supply/.
For those who wish to use financial aid or want it right away, the bookstore will be carrying the NAD at a slightly elevated price.

Recommended Materials

Computer Organization and Design MIPS Edition: The Hardware/Software Interface
(The Morgan Kaufmann Series in Computer Architecture and Design) by David A. Patterson, John L. Hennessy, ISBN-13: 978-0124077263

Course Schedule

Week	Class Topic	Exercise/Lab Session
1	Introduction, Syllabus, Binary Number and Binary Codes	
2	Binary Number and Binary Codes, Gate-Level Models & Switch Algebra	Lab Session 0
3	Switch Algebra, Introduction to VHDL	Exercise Session I
4	Design of Combinational Circuits	Lab Session 1
5	Sequential Circuits (Latches, Flip Flops Registers)	Exercise Session 2
6	Automata/Finite State Machines	Lab Session 2
7	Register-Transfer-Level (RTL)/Microarchitecture	Exercise Session 3
8	Register-Transfer-Level (RTL)/Microarchitecture	Lab Session 3
9	Control Path/Single Purpose Processor	Exercise Session 5
10	Control Path/Single Purpose Processor	Lab Session 4
11	MIPS ISA/Assembler Programing	Exercise Session 6
12	Processor Design	Lab Session 5
13	Processor Design	Exercise Session 7
14	Programmable Logic, Review	Review
15	Review	Review

Attendance Policy, Class Expectations, and Make-Up Policy

- Class announcement, communication and exchange among students and between students and instructors will be done through slack. Every student should register through the following link : https://join.slack.com/t/eel3701digita-fsg1612/shared_invite/zt-1e85ertrn-ON5rHzApJ14HDtLVWVlegg
- 10% of the final grade is made upon class attendance and random quizzes which can be given in class, exercise, or lab sessions.
- Missing a random quiz in class, exercises or lab without proper justification automatically results in a loss of the corresponding number of points.
- Labs consist of two parts: a pre-lab section (in general, theory) that students must complete at home before the lab. Student who failed to submit this section before the lab will not be admitted in the lab session and will automatically lose the corresponding number of points.
- Students are expected to complete their labs during a single session. Students who did not complete their lab can do it in their next lab sections along with the current lab. Students can also complete and demonstrate their design in their PI office hour.
- Lab reports are due one week after the lab. Submission deadline will be provided on Canvas. Late submission of lab reports and homework result in a 10% penalty for every week delay, with a maximum of 40% penalty
- Cell phones are allowed in class, in silent mode only. Students can record the classes and lab only for the purpose of leaning and revision.
- Students who cannot take the exams on the scheduled date must provide proper justification to take a makeup exam.
- Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets		20%
Labs		20%
Random Quizzes		10%
Midterm Exam		25%
Final Exam		25%
Total		100%

Grading Policy

The following is given as an example only.

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	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

Students Requiring Accommodations
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

In-Class Recording
Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

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 Conduct Code (https://sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. If you have any questions or concerns, please consult with the instructor or TAs in this class.

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
- Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@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@eng.ufl.edu

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: https://registrar.ufl.edu/ferpa.html

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: https://counseling.ufl.edu, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

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

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/.

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.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling; https://career.ufl.edu.

Library Support, 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/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/;https://care.dso.ufl.edu.

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process.