EEL 3701C: DIGITAL LOGIC AND COMPUTER SYSTEMS

https://mil.ufl.edu/3701/ eel3701.slack.com *UF's Canvas*

INSTRUCTOR Dr. Eric M. Schwartz ems@ufl.edu 352-392-2541 MAEC 106 Office Hours: Wed: 12:50pm, Fri 1:55pm

LECTURES Tues 2nd-3rd (8:30-10:25am) & Thur, 3rd (9:35-10:25am) in NEB 202
Tues 8th-9th (3:00-4:55pm) & Thur 9th (4:05-4:55pm) in TUR L011

LABS (NEB 248)
***PI** = Peer Instructor
(PI=UPI=Undergrad PI)

Mon			Tues			Wed			Thur			Fri		
Class #	Start	PI*	Class #	Start	PI	Class #	Start	PI	Class #	Start	PI	Class #	Start	PI
			11786	09:35am		11766	09:35am		11751	10:40am		11765	09:35am	
			11750	11:45am		11748	11:45am		11789	12:50pm		11747	11:45am	
20275	1:55pm		11745	1:55pm		11768	1:55pm		11764	4:05pm		11770	1:55pm	
28956	4:05pm		11746	4:05pm		11749	4:05pm		11769	6:15pm		11767	4:05pm	
11744	6:15pm		11787	6:15pm										

PREREQUISITES: None (but some knowledge of programming would be helpful)

REQIRED TEXTBOOK (Share, Borrow, Buy, or Rent one of the below. See https://mil.ufl.edu/3701/admin/3701_Textbook.pdf for more info)

- Charles H. Roth Jr., *Fundamentals of Logic Design, Enhanced 7th edition*, Cengage Learning, Stamford, Connecticut, 2021. ISBN: 1337620351
- Charles H. Roth Jr., *Fundamentals of Logic Design, 7th edition*, Cengage Learning, Stamford, Connecticut, 2014. ISBN: 1133628478
- Charles H. Roth Jr., *Fundamentals of Logic Design, 6th edition*, Cengage Learning, Stamford, Connecticut, 2009. ISBN: 0495471690
- Charles H. Roth Jr., *Fundamentals of Logic Design, 5th edition*, Thomson Brooks/Cole, Belmont, California, 2004. ISBN: 0534378048

RECOMMENDED REFERENCE TEXTBOOK
Reprinted Chapters 1-7 from H. Lam, and J. O'Malley, *Fundamentals of Computer Engineering: Logic Design and Microprocessors, 1st edition*, 1988, John Wiley and Sons, New York, available for **free** at https://tinyurl.com/UF-Lam.

COURSE OBJECTIVES (ABET Design Content 50%) [Lab fee: $116.71]
Official: Overview of logic design, algorithms, computer organization and assembly language programming and computer engineering technology. Laboratory.
Actual: To learn to: perform elementary manipulations of Boolean algebraic equations; simplify logic expressions; design combinational and sequential circuits; use a digital design and simulation package, use a l description language (HDL), analyze binary storage device behavior and applications. Also to study the fundamentals of microprocessor architecture, including assembly language programming, and to understand the design of a basic microprocessor.

PI OFFICE HOURS
You may go to any PI available (in NEB 248, if no lab; else NEB 222) for help during their office hours. (See the Faculty/PIs webpage for the office hours. Note that some office hours might be remote.) You are encouraged to use our slack's *#help* channel for questions. The slack rules for our course (as well as a link to join) are available here. E-mail (not a slack DM) is preferred for individual questions to communicate with the instructors and PIs. PIs will also hold a few help sessions, which will be announced in Slack.

Name	Andrea Chacon	Evan Chang	Kevin Chen	Emely Chhu	Jackson Fugate	Garret Godfrey	Matthew Hershfield	Sharika Khondaker
e-mail	andrea.chacon@ufl.edu	evanchang@ufl.edu	k.chen1@ufl.edu	emelychhu@ufl.edu	jacksonfugate@ufl.edu	garret.godfrey@ufl.edu	mhershfield@ufl.edu	s.khondaker@ufl.edu

Name	Emily Namm	Zain Nasrullah	Landon Nayab	Sarah Schultz	Anna Sheehan	Nathan Thompson	Steven Miller	Emily Namm
e-mail	enamm@ufl.edu	z.nasrullah@ufl.edu	landon.nayab@ufl.edu	schultzsarah@ufl.edu	annasheehan@ufl.edu	nathanthompson@ufl.edu	millersteven@ufl.edu	enamm@ufl.edu

LECTURE FORMAT
The course lectures and labs will be entirely synchronous and in-person. This means that your lectures and labs will occur at the times specified when you registered. Nothing will be Zoomed this semester, other than our practicals and exams (and some office hours).

EXAM/PRACTICAL SCHEDULE
Each of our mid-term exams/practicals are administered in the evenings. All of our Practicals and Exams will utilize Honorlock with Zoom.

Exam/Practical Schedule

ITEM	Date	Time
Practical 1	Tues, 28 Feb	8:20pm
Exam 1	Wed, 1 Mar	8:20pm
Practical 2	Wed, 19 Apr	8:20pm
Final/Exam 2		**TBD**

REQUIRED HARDWARE

- The *Digilent Analog Discovery 2* (**DAD**) *board* is required for this course (and many other ECE courses). DADs are presently available from the UF Bookstore for $279, while supplies last; as of today, they are also available from Digilent and at DigiKey , Adafruit, and other companies, but for a significantly higher price. (Students in the course can**not** share the devices, since everyone will need their own during two of our exams.)
- You **MUST** have and use your own laptop computer for this course. If your computer does not have **three** USB (type A) ports (one to power your circuits, one to program your PLD, and one for your DAD), then you will need to buy a USB Port Expander (generally, $7 to $15). (You could use only two, but with only two you will need to continuously switch USB connections as you reprogram and test your designs.)
- Because our quizzes, practicals, and final exam will all use Honorlock, you must have a speaker or set of speakers for your computer for these assignments. Neither headphones nor earbuds will not be allowed.
- A UF 3701 lab kit will be given to you in your first lab meeting (Lab 0) This kit contains the additional hardware that you will utilize over the course of the semester. The UF 3701 lab kit, including the printed circuit boards (PCBs), was designed by *Out of the Box: Electronics and Robotics* (http://ootbrobotics.com/) to meet my specifications. Your lab fees pay for the 3701 lab kit. Your parts kit comes with two PCBs, both a large and a small prototyping breadboard, a wire kit, multiple and various ICs, LEDs, switches, and several types of resistor packages. **You probably cannot buy the kits separately, so please be careful as you design and construct your circuits this semester.**

See the below link for ECE Department's requirements ***Computer, Equipment, and Tools Requirements*** for undergraduate students: https://www.ece.ufl.edu/academics/undergraduate/advising/computer-equipment-and-tools-requirements/. The following are some of the items listed: DAD, temperature regulated soldering iron, solder, flux, desoldering braid (aka solder wick), safety glasses, multimeter (better than the one that you get in the UF 3701 lab kit).

SOFTWARE REQUIREMENTS

Intel Quartus Prime (from Altera, now owned by Intel) is available to download, free of charge, from Altera's website and our website. With Quartus, you can design and simulate circuit design using either schematic entry or a hardware description language (e.g., VHDL and Verilog). Quartus will be used regularly, throughout the semester.

CLASS AND EXAM BEHAVIOR

Turn off all cell phones, laptop sound effects, and other noise making devices (including your microphone) before entering our classroom (or Zoom, for practicals and exams). If a noise-making device goes off during class, I reserve the right to lower your course grade. Do not visit websites, play games, or use other programs or apps during class that might distract nearby students.

GRADING POLICY

Grades are periodically posted on the class web site. **It is your responsibility to check your grades regularly** (on both Canvas and our course website) since mistakes often happen when dealing with a large number of students and PIs. **All grades are final one week after posting** (on either Canvas or our course website)**.** After curving quizzes and our final exam as needed, course grades are assigned using the 60 (D), 70 (C), 80 (B), and 90 (A) cuts. [$90 \rightarrow 100$ (A), $86.\overline{6} \rightarrow 89.\overline{9}$ (A-), $83.\overline{3} \rightarrow 86.\overline{6}$ (B+), $80 \rightarrow 83.\overline{3}$ (B), $76.\overline{6} \rightarrow 79.\overline{9}$ (B-), $73.\overline{3} \rightarrow 76.\overline{6}$ (C+), $70 \rightarrow 73.\overline{3}$ (C), $66.\overline{6} \rightarrow 69.\overline{9}$ (C-), $63.\overline{3} \rightarrow 66.\overline{6}$ (D+), $60 \rightarrow 63.\overline{3}$ (D), $56.\overline{6} \rightarrow 59.\overline{9}$ (D-), and $0 < 56.\overline{6}$ (E)].

Part of your grade on exams, labs, homework, quizzes, etc. is based not only on solving a problem, but the manner in which you solve it. For example, there is a difference between two designs that meet the given specifications, but one is an elegant, modular 3-element solution, while the other is an obfuscated 7-element design that also meets the specifications but would be difficult to extend later. Just as your future employer would value the latter design less than the first, so will I in grading your assignments.

The UF grading policies for assigning grade points can be found on the following undergraduate catalog web page: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx.

All grades are **non**-negotiable **one week** after the grade is posted. Please don't come to me after the final grades have been posted with a hard-luck story.

COURSE GRADE DETERMINATION

I have found that attendance is directly correlated to grades. Therefore, attendance is required, but is **NOT** worth positive points. Each missed class (or a poor attendance quiz result) results in a deduction of one point (out of 100) from your overall course total. There are no excuses for missed classes, but four classes can be missed without penalty. (Since there are 29 classes this semester, missing four classes is 14%! You can miss the 13 of the attendance quiz questions with absolutely no penalty, if you attend each class; each of the quiz questions are worth 0.3 and the "are you here" questions are worth 0.7.) We will have attendance quizzes through Canvas, each with a simple question, at least for those that have attended and paid attention in our lectures (and completed previously due homework). Late arrival or early departure (when missing the quiz) will count as an absence. In order to take the attendance quizzes, you will either need your laptop or a smart phone, running Canvas.

Laboratory*	30%	(Lab values vary, i.e. it could count as 1/3 a lab, a single lab, a double lab, etc.)
Homework	6%	(8-12)
Exams 1	27%	
Practical 1	3%	
Practical 2	7%	
Final/Exam 2	27%	
Total**	100%	(90+ on combined Final/Exam 2 and Practical 2 results in 5% grade bonus, e.g., 86% ⇒ 91%)

All grades are **non**-negotiable **one week** after the grade is posted. Please don't come to me after the final grades have been posted with a hard-luck story.

* Perform all laboratory experiments. A grade of 65% or better for your lab weighted average is ***required*** in order to be eligible to obtain a passing grade in the course (i.e., to earn a grade better than E). Your lowest lab (**excluding** Lab 6) will be dropped **if you submit the pre-lab late**, as specified in § Laboratory Attendance. But **use this drop wisely**, i.e., do **not** just skip a lab since all labs are important and your next missed lab may be unavoidable. If you need to miss a single lab, it's ok; you **cannot** make up the missed lab. (You should do this lab on your own and turn in the pre-lab report as specified. If necessary, you may visit a PI during an office hour for help.) **If you have a valid reason for missing this lab, get documentation for your first missed lab and hold on to it.** If you miss a **second** lab, you must show Dr. Schwartz(not a PI) **written documentation for BOTH your first and your second missed labs**. This documentation should be official and from a doctor, judge, etc., so that a make-up can be arranged. You must notify the professor **prior** to your scheduled second missed lab or **as soon as possible after** your second missed lab. **There is rarely an excuse that will allow you to reschedule your first missed lab other than an exam in another course or an officially sanctioned academic event.** You must notify Dr. Schwartzat least **8 days** prior to your exam (or other event) so that an alternate lab time might be arranged.

** Attendance is required, but is **NOT** worth positive points. See § Course Requirements for more details

Note: All grading percentages are subject to change at Dr. Schwartz's discretion. Students will be notified of any changes.

EXTRA CREDIT

Extra credit is sometimes offered during class (or on the web, by slack, or by email). The amount of extra credit given is at the discretion of Dr. Schwartz unless specifically stated with the extra credit opportunity.

SCANNING SOFTWARE

Some parts of homework, labs, and exams may require you to scan some of your handwritten work. Both *CamScanner* (http://www.camscanner.com/user/download) and *Fast Scanner* (https://www.coolmobilesolution.com/) are available for Android Phone and iPhone. Install one, & email a scan to yourself to verify that it works. Learn how to get clear scans; black and white scans are usually best, and are required for exams. Unclear scans **will not** be accepted. Unless other specified, when scans are request for a particular assignment, a **single pdf** document should be created and submitted. You also are expected to have access to a cell phone camera for taking pictures of various hardware designs that you may construct during the semester for homework, labs, and exams. Figure out how to get the scan you take with your cell phone to end up on your PC **automatically** with some cloud storage software such as DropBox, Google Drive, OneDrive, or iCloud. This upload should **not** require ANY action to get the file to your PC (such as opening an email, a website, or an app).

HOMEWORK GRADING

Homework is submitted through Canvas by the assigned deadline. Unless other specified (sometimes additional files are requested), a **single pdf** document should be submitted for each homework. You must use the homework template provided on our website. Scans of various parts of the homework are acceptable, but the scans must be incorporated into the single submission document. Missed homework can**not** be made up, but your lowest homework is dropped. Homework solutions are sometimes posted on our class web-site **before** they are due. It is **not** appropriate to copy the supplied solutions; this constitutes cheating. Homework will only be graded in a cursory fashion, i.e., Zen grading is used. The grades will be entered into the grade book as 0 (no significant effort or not submitted), 1 (half-hearted attempt), or 2 (significant attempt). The final course grades will be assigned with strict cuts between grades, but HW **could** push you above a cut. In addition, the exams will be partly based on the assigned homework. Since graded homework is not returned and is graded only for effort, students should compare their solutions to the posted solutions. **Late homework is not accepted**.

EXAM RE-GRADE POLICY

If you believe an error has been made on an exam score you must make an **email** request (with subject *3701: Exam X Regrade Petition*) to Dr. Schwartz explaining where the misgrading or error occurred. This request must be submitted **immediately at the end of the class in which the exam is returned**. If you do resubmit an exam for regrade, the instructor reserves the right to scrutinize and regrade the **entire** exam. This definitely places your current score at risk. Consequently, it is not advisable to resubmit an exam for correction unless a blatant error, such as a miscalculation of total points, has been made. You **must** make it clear what writing you added to the exam (by clear indication, e.g., use a different color pen or pencil) after it was graded.

HOMEWORK SOLUTIONS, PRACTICE EXAMS, AND COURSE GRADES

Solutions to homework will be made available on our class web site at https://mil.ufl.edu/3701/, along with periodic postings of your grades and the class grade statistics. Practice exams (a few with solutions and many without solutions) are also posted.

COURSE REQUIREMENTS (IMPORTANT!!!)

1. Perform all laboratory experiments. A grade of 65% or better is your lab weighted average is ***required*** in order to be eligible to obtain a passing grade in the course (i.e., to earn a grade better than E). Your lowest lab (**not including** Lab 6) will be dropped **if you submit the pre-lab late**, as specified in § Laboratory Attendance. But **use this drop wisely**, i.e., do **not** just skip a lab since all labs are important and your next missed lab may be unavoidable. If you need to miss a single lab, it's ok; you **cannot** make up the missed lab. (You should do this lab on your own. If necessary, you may visit a PI during an office hour for help.) **If you have a valid reason for missing this lab, get documentation for your first missed lab and hold on to it.** If you miss a **second** lab, you must show **Dr. Schwartz** (not a PI) **written documentation for BOTH your first and your second missed labs**. This documentation should be official and from a doctor, judge, etc., so that a make-up can be arranged. You must notify the Dr. Schwartz **prior** to your scheduled second missed lab or **as soon as possible after** your second missed lab. **There is rarely an excuse that will allow you to reschedule your first missed lab other than an exam in another course or an officially sanctioned academic event.** You must notify Dr. Schwartz at least **8 days** prior to your exam (or other event) so that an alternate lab time might be arranged.
   - If you believe that you have valid university-related reason for missing a particular lab (e.g., Lab X), send an email to Dr. Schwartz with the following information (with subject: ***3701: Conflict with Lab X***, where X is the lab number).
     - State the cause for missing your Lab X and provide associated documentation for this event.
     - Info about your normally scheduled Lab X. i.e., PI's name, Lab X date (day and date) and time, lab class number (5 digits)
     - Lab X dates (class number, day, and date) that you will be **unavailable** for your Lab X.
     - **ALL** other scheduled Lab X dates (day, date, periods, times, class number) that you will be **available** for your Lab X (in order of your preference). Note that I will try to accommodate your preference AFTER I try to find a lab with available space.
     - If this is for an exam in another course, **first** verify that there are no alternate exam times available. If none, then provide Dr. Schwartz the course number and course name, and also your teacher's name, email, and phone number. Also provide a link or screen shot of the cause of the conflict.
   - Labs **must** be done at scheduled times (except as described above).
   - Students **must** be prepared to demo their lab when they enter. Students will be randomly selected for their demonstration times during their lab period.
   - An average lab grade of **65% or higher** is required to be **eligible** to **pass** the course!
2. Class attendance is mandatory. Roll will be taken by means of a short Canvas quiz. (The quiz is normally very simple material from the prior class or presented previously in the class in which the quiz is administered.) Each missed class when roll is taken (or a poor attendance quiz result) will cost one half point (out of 100) from your overall course total. Roll may be taken more than once in class; if you leave and a second roll is taken, this will be interpreted as an honor code violation.
   - If attending lectures on Zoom, you must **keep your camera on at all times**; the alternative is to come to class in-person. (Exceptions are possible with prior approval.) If your camera is turned off at any time in Zoom, you will also earn a zero on that day's attendance quiz.
   - ***No excuses accepted, but FOUR free drops.***
   - ***Missed classes cannot be made up.***
   - If you miss the first two classes and do not notify me, **you will be dropped from the course**.
3. Complete and submit all homework assignments and turn them in **through Canvas before** the time that they are due.
   - ***Late homework will not be accepted.***
4. Lab submissions are due at least fifteen minutes before your lab. See the *Lab Rules & Policies* for more details.
5. Take all exams and practicals as scheduled.
   - ***No makeup exams or practicals will be given except in cases of a medically documented incapacity or family emergency.***
   - If you believe that you have a valid exam or practical conflict, please send me the info specified above for a lab conflict (again, at least **8 days** in advance), but with the subject: ***3701: Conflict with Exam/Practical X***, where *X* is the exam/practical number. Please specify the times of your conflict and then times immediately before **and** after the scheduled exam/practical time when you **are available**.

STUDENTS REQUIRING ACCOMMODATIONS

The University of Florida is committed to providing academic accommodations for students with disabilities. Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://disability.ufl.edu/) by providing appropriate documentation. See https://disability.ufl.edu/students/get-started/ to start the process to request academic accommodations. Once registered, a student should present his/her accommodation letter to me supporting a request for accommodations. The University encourages students with disabilities to follow these procedures as early as possible within the semester. For your optimal benefit, you must see the professor **during the first week of classes**.

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

HEALTH AND WELLNESS (UF COUNSELING SERVICES)

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling & Wellness Center, https://counseling.ufl.edu/, 3190 Radio Road, (352) 392-1575.
- SHCC mental Health, Student Health Care Center, http://shcc.ufl.edu/, Infirmary Building, 1 Fletcher Drive, 392-1161.
- U Matter, We Care, http://www.umatter.ufl.edu/, umbrella organization for UF's caring culture and provides students in distress with support.

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 and 392-1575
- **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 Recover Services (SARS)**: Student Health Care Center, 392-1161
  - Resources for Sexual Violence, https://umatter.ufl.edu/helping-students/sexual-violence-response/, Immediate Response/Advocacy 392-5648 or 392-1111; Medical Care from Student Health Care Center, 392-1161
- **University Police Department**: 392-1111 or http://www.police.ufl.edu 9-1-1 for emergencies.

ACADEMIC RESOURCES

- E-learning technical support, https://elearning.ufl.edu/, 392-4357, email: Learning-support@ufl.edu..
- Career Connections Center, https://career.ufl.edu/, 392-1601. Reitz Union. Career development assistance and counseling.
- Library Support, https://uflib.ufl.edu/find/ask/.
- Teaching Center, https://teachingcenter.ufl.edu/, 392-2010. Broward Hall. General study skills and tutoring.
- Writing Studio, https://writing.ufl.edu/writing-studio/, 846-1138, 302 Tigert Hall. Help brainstorming, formatting, and writing papers.
- Ombuds office, https://ombuds.ufl.edu/. Ombuds office exists to assist students, staff, and faculty in resolving problems and conflicts.
- 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

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/.

LECTURES, LABS, QUIZES, PRACTICALS, AND EXAMS (ZOOM AND HONORLOCK)

During this semester, the course will be entirely synchronous. This means that your lectures and labs will occur at the times specified when you registered. Practicals and the midterm exam will be in the evening.

Lectures are face-to-face. Your course assignments will be specified on Canvas, but more information will be available on our website (www.mil.ufl.edu/3701/). All homework and lab submissions will be through Canvas. Quizzes, Practicals, and Exams will be administered through Honorlock (and Canvas Quizzes) with Zoom. Honorlock is an online proctoring service. Sometime during most classes, there will be a Canvas Quiz; therefore, all students will need computers (or at least a smart phone).

Just prior to connecting to Zoom for our lectures, quizzes, practicals or exams, open Canvas. You will need to log into Zoom (at https://ufl.zoom.us/) before being admitted to the Zoom. Use your full name for our Zoom meetings, i.e., no nicknames or other alternatives. Even students in the classroom will need to access Canvas for every class.

o take quizzes and exams in the course from almost any location, as long as you have a computer, and the following required components: webcam, microphone, speaker, and a stable Internet connection. Minimum upload and download bandwidths of 2 Mbps are required for this course. If you don't have the bandwidth or any of this hardware, you must secure these in order to participate in the course. (Note that **neither** headphones **nor** earbuds are allowed during Honorlock administered assignments.)

For Honorlock, you do not need to create an account, but will need Google Chrome (available from www.google.com/chrome/). You will also need to download the Honorlock Chrome Extension (from www.honorlock.com/extension/install).

When you are ready to start your lab quiz, practical, or exam, connect to relevant Zoom assignment and then turn off your camera. Now log into Canvas, go to our course, and click on the appropriate assignment. Click "Launch Proctoring" to begin the Honorlock authentication process, where you will take a picture of yourself, show your ID, your blank scratch paper (if allowed), and perform a complete a scan of your room. An adequate room scan should take approximately one minute. Honorlock will record your exam session by webcam and also record your screen. Honorlock also has an integrity algorithm that can detect search-engine use, so please do not attempt to search for answers, even if it's on a secondary device. There are many more Honorlock rules; these should be investigated **BEFORE** your relevant Honorlock-monitored assignments.

When you are ready to start a Honorlock-monitored assignment (quiz, practical, or exam), connect to the relevant Zoom assignment and then turn off your camera. Then log into Canvas, go to our course, and click on the appropriate assignment. Click "Launch Proctoring" to begin the Honorlock authentication process, where you will take a picture of yourself, show your ID, the front and back of all of your blank scratch paper (if allowed). Honorlock will record your exam session by webcam and also record your screen. Honorlock also has an integrity algorithm that can detect search-engine use, so please do not attempt to search for answers, even if it's on a secondary device. There are many more Honorlock rules; these should be investigated **BEFORE** your relevant Honorlock-monitored assignments.

Due to a recent court finding, Honorlock room scans will no longer be done at UF prior to the start of the exam. However, during the exam, if there is any detection of a possible Honor Code violation, a room scan may be requested by those monitoring the data collection for each examination. An adequate room scan should take approximately one minute. Instructions on how to do a proper room scan are available here.

If you ever have WiFi or other internet connection problems just before or when your practical, quiz, or exam, use your phone to send **BOTH** a slack message **and** an email to the relevant PI **and** Dr. Schwartz. Describe the issue and continue to **try to get back in**!

Honorlock support is available 24/7/365. If you encounter any issues during a quiz, exam or other assignment, **contact Honorlock by live chat**, which should be available inside Honorlock. If you are kicked out of Honorlock, you can go to https://honorlock.com/support/ and select ***begin live chat***. At other times, i.e., not during a monitored assignment, you can send Honorlock an email (support@honorlock.com). Zoom chat Dr. Schwartz if this problem occurs during a Honorlock-monitored assignment. **If your internet goes out, connect to Zoom with your cell phone.**

As part of your Honorlock-monitored assignment, at the end of the timed session, you may be asked to scan some of your exam work. See § *SCANNING SOFTWARE* for more information.

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.

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.

TECHNOLOGY
The use of cell phones and **every other** technology device not directly specified as allowed is strictly prohibited during live assignments (labs, quizzes, practicals, or exams). All use of disallowed electronic devices (or inappropriate use of allowed devices) during a live assignment will be considered a violation of the student honor code (i.e., cheating). See the *Honesty Policy* section below for the minimum penalties that are incurred for all cases of cheating in our course. Laptop computer and tablets are welcome in class as long as they are used for class-related work. Surfing the web, checking email, making posts, etc., is strictly prohibited (**if distracting to others**) and will result in course grade deductions.

During practical exams, no use of the internet (other than Zoom and Honorlock) or other external access is **not** allowed. You may only use files and software on your computer that are explicitly specified by Dr. Schwartz several days prior to the practical exam date.

TWO-STEP AUTHENTICATION BACKUP
You should get a backup for the two-step authentication. See https://it.ufl.edu/2fa/using2fa/. There have been students who had cell phone issues (like a lost phone, a broken phone, or the battery runs out) just before starting a quiz/exam and were unable to participate. To assure that you can always get in, generate some passcodes and always keep them with you (perhaps in your wallet). To do this, go to account.it.ufl.edu and select *GENERATE PASS CODES*; then login and authenticate as normal and select the *GENERATE PASS CODES* button. Five codes will appear, each of which will work once and do not expire.

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.

COMMUNICATION
Slack is utilized for course announcements. You are also responsible for getting the slack. You are also responsible for regularly checking announcements and course-related postings on the class website, Canvas, and your UF email.

MULTIMEDIA CLASS/AUDIENCE NOTES
Audience notesare normally posted on the class web site every week or so for the subsequent week or more of classes. The notes consist of pdf versions of the class PowerPoint slides. These notes are not required but are **highly** recommended. Check the class web site for information on exactly when the notes are available. **For optimal performance**, read the notes and examples for a class **before** that class and augment the material with your own notes during class. My notes are removed shortly after they are covered in class.

Historically, student that take good notes perform much better in this course then those who do not take notes (or take poor notes). Augmenting my notes with your own is strongly encouraged.

All grades are **non**-negotiable **one week** after the grade is posted. Please don't come to me after the final grades have been posted with a hard-luck story.

HONESTY POLICY
All students admitted to the University of Florida have signed a statement of academic honesty committing them to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. The following pledge is required for all work submitted for credit by University of Florida students: "On my honor,

I have neither given nor received unauthorized aid in doing this assignment." This statement is a reminder to uphold your obligation as a student at the University of Florida and to be honest in all work submitted and exams taken in this class and all others. UF students are bound also 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." Each quiz, practical, and exam should be assumed to contain that specific pledge; opening and starting the assignment commits you to honoring that pledge.

*CHEATING WILL **NOT** BE TOLERATED*. We will actively search for cheaters; we have and will use excellent software to help us in the search. If you are caught, there will be no negotiations. You will earn a course grade penalty (often failure for the course) and get reported to the honor court. There are **no excuses and no exceptions**. You may talk to other students about assignments, but the final work **must** be your own. You must also report others (anonymously, if desired) that you suspect are cheating. If you are caught cheating on **any** assignment (homework, lab, quiz, practical, or exam, etc.), you **will** be prosecuted. A meeting with the UF honor court, along with the instructor, will determine penalties, none of which are desirable or pleasant (*i.e.,* cheating in this course always results in notification to the honor court, often results in a failing grade in the course, and can possibly result in suspension or expulsion from the university). If you know someone is cheating, **it is your responsibility to report it**. For more information about cheating, the UF Honor code, and the consequences of academic dishonesty, please refer to https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/ and the UF Honor Code, available on that website. If you have any questions or concerns, please consult with Dr. Schwartz. The flow chart for an honor code violation is available here. A link to report an academic honesty incident is available here.

Each lab section has their own lab quiz. Because there are labs on every day of the week, some students will have their lab up to six days before other students. Since all quizzes for a particular lab will each be coving the same topics, information about another section's quiz would give a student an unfair advantage over other students. Therefore, while the lab is still ongoing, you should **NOT** 1) communicate with other students in the course (outside of your own lab section) about your lab quiz, 2) give hints about the quiz, or 3) ask any other student for information about their quiz. Sharing lab quiz information in any of these ways is a violation of the honor-code policy and will be treated as such.

WORKING TOGETHER

You are encouraged to work with other students on assignments in a professional manner. Each person in the group should attempt to solve all problems **independently** and **only** then discuss the results with one's partner(s) to correct errors. Copying your partner's work constitutes cheating and should not be permitted. All solutions should reflect your style of problem solving. You may **not** copy and submit old or new posted solutions as if they were your own.

Although you may **consult** with other students, PI's, or instructors for your assignments, you **must** do independent work. Consulting means **"seeking opinions or advice," not** getting working solutions, programs, or designs, understanding them, and then modifying them to make them your own. The latter constitutes cheating (see above section). Working side-by-side to find a solutions, construct a program, or design in a group constitutes cheating. (Solving homework are good practice for solving quizzes and exams, which are also **not** group activities.) **You should note that we have used and will continue to use software that can detect similar submissions.**

Failure to do your own work in lab will likely result in failure in these associated quizzes, practicals, and exams.

HANDOUTS

Handouts are supplied on-line and can be downloaded from the class web site: https://mil.ufl.edu/3701/.

LABORATORY RULES & POLICIES

See *Lab Rules & Policies* for important information that you should re-read prior to each lab submission. Prior to the start of your first lab, you must sign and submit this document (as proof that you understand and will follow the rules) or you will not be admitted to the lab.

LABORATORY GRADING

You will not be admitted to the lab without a previously submitted *Pre-Lab Report*, as described in the *Lab Rules & Policies*. The *Pre-Lab Report* and other files also **must** be submitted through Canvas at least fifteen minutes **BEFORE** the start of your lab.

Each circuit diagram, VHDL file, and assembly language program must have your name (computer) printed at the top. **ALL** simulations should be clearly annotated. Quartus files should be sent in a **Quartus archive file**. Demonstration videos of up to three minutes must also be submitted prior to your lab.

Grading emphasis will be placed upon your producing well documented, well-structured design circuitry that realizes the functional requirements specified by the lab handout and the lab instructor. The remaining portion of your grade will result from observations by your lab instructor on such matters as your understanding of the lab, your lab techniques, your pre-lab preparation, your lab results and your cooperation and compliance with the rules. Having your design perform properly does **not** guarantee a grade of 100, but makes a 100 grade **possible**. Lab designs and/or software that are similar and/or identical to other student's work constitute cheating (see above) and will be reported to the professor for further discipline (and will result in failing the course, honor court charges, or expulsion). There will be a quiz at the beginning of most labs (worth up to 40% of your total lab score). If you are late for a lab, you will get a zero for the quiz.

LABORATORY ATTENDANCE

Laboratory attendance during scheduled times is mandatory. **Documented** personal or family emergency will be accepted as an excuse for absence for a **second** missed lab if documentation for a **first** missed lab is **also provided**. In such cases, consult Dr. Schwartz (**not** your PI) about a make-up lab **as soon as possible**. See ***Course Requirements*** for more details. Students should make serious attempts on **all** labs. **Grades less than 50% may be interpreted as not a serious attempt and may be scaled to 0. Note: ALL** students **MUST** have everything working **BEFORE** coming to lab.

Failure to attend your scheduled lab will result in a lab grade of zero, even if you previously submitted the required lab documents.

You will **not** officially makeup your dropped lab. But within one week of you missed lab (or by the submission deadline of your **next** lab), you must submit the missed pre-lab report. You will **lose the lab drop if you fail to submit the pre-lab document**. You should do this missed lab at home (or, if necessary, during a PI office hour) to be sure you understand the required material.

LABORATORY TOPICS

Lab Number	Probable Topic s
0	Build your PLD board; intro to software and parts
1	Quartus intro; Logic design and implementation (with discrete parts)
2	MSI circuit design and implementation (with discrete parts & PLD)
3	Counter design and implementation
4	Registered Arithmetic Logic Unit (RALU) design & implementation
5	State Machine design and implementation
6	CPU with ROM-based instructions
7	G-CPU simulation and assembly language programming

RECIPE FOR SUCCESS

Recently, a student asked me how to be successful in our course. I thought it would be helpful to share what I told the student.

0) Take care of your health by sleeping well, eating well, and participating in some regular physical activity.
1) Attend all classes and actively participate by trying to follow the material, take notes, and ask questions (or write them down to ask later), if you have any.
2) Work a little bit on the material every day, even if it is only for an hour.
3) Review the notes within 24 hours after a class and read the relevant textbook sections (if any) with 24-48 from that class.
4) Complete all homework.
5) Read a lab as soon as we have gone over the relevant material. Start on it ASAP, at least trying to understand it.
6) Start each lab a week in advance of the due date, generally immediately after your prior lab is done.
7) When you don't understand something, immediately ask a question in class, slack, or go to the next PI, or faculty office hour.
8) If there are help sessions participate; if you can't participate live, watch the videos.
9) Before exams, complete several practice exams. Do these **BEFORE** the exam help session(s) and then go to the help sessions to see the PIs solve those exams.

EL 3701 Schedule: Part 1 of 2

WEEK/DAY		DATE	LAB	LECTURE	Tentative Weekly Topics / Comments
1	M	9-Jan	No lab	No class	UF classes begin (but not ours!)
1	Tu	10-Jan		1-2	Syllabus, web site; Digital Design, Basic logic
1	W	11-Jan			Intro. to Quartus
1	Th	12-Jan		3	
1	F	13-Jan			**Drop/Add ends Friday at 11:59pm**
2	M	16-Jan	No lab	No class	**Holiday: Martin Luther King Jr. Day**
2	Tu	17-Jan		4-5	CCC Career Showcase: Jan 17-18, 9am-3pm AI & CISE Career Fair: Jan 17, 1-6pm Diversity Meet-up: Jan 17, 5-7pm Truth (Logic) Table / Voltage Table
2	W	18-Jan			CCC Career Showcase: Jan 17-18, 9am-3pm Mixed Logic
2	Th	19-Jan		6	ICs, introduction to mixed, positive, and negative logic
2	F	20-Jan			
3	M	23-Jan	0		
3	Tu	24-Jan	0	7-8	ECE Virtual Career Fair: Jan 24-26, 9am-4pm Number Systems, Math
3	W	25-Jan	0		ECE Virtual Career Fair: Jan 24-26, 9am-4pm Boolean Algebra
3	Th	26-Jan	0	9	ECE Virtual Career Fair: Jan 24-26, 9am-4pm MSOP, MPOS, Simplification
3	F	27-Jan	0		
4	M	30-Jan	1		MSI: MUX, deMUX, decoder
4	Tu	31-Jan	1	10-11	K Map
4	W	1-Feb	1		
4	Th	2-Feb	1	12	
4	F	3-Feb	1		
5	M	6-Feb			More MSI: encoder, adder, BCD 7-seg decoder
5	Tu	7-Feb		13-14	Even more MSI: tristate buffer, ALU
5	W	8-Feb			Introduction to sequential circuits: Flip-flops
5	Th	9-Feb	2	15	
5	F	10-Feb	2		
6	M	13-Feb	2		Flip-flops and next state/excitation tables
6	Tu	14-Feb	2	16-17	Design with flip-flop, Counter design, Debouncing
6	W	15-Feb	2		
6	Th	16-Feb	3	18	
6	F	17-Feb	3		
7	M	20-Feb	3		MSI sequential circuits - Registers, counters
7	Tu	21-Feb	3	19-20	RAM/ROM
7	W	22-Feb	3		
7	Th	23-Feb		21	
7	F	24-Feb			
8	M	27-Feb			State Machines
8	Tu	28-Feb		22-23	**Practical 1: Tues, 28 Feb, 8:20pm**
8	W	1-Mar			**Exam 1: Wed, 1 Mar, 8:20pm**
8	Th	2-Mar		24	
8	F	3-Mar			

EEL 3701 Schedule: Part 2 of 2

WEEK/DAY		DATE	LAB	LECTURE	Tentative Weekly Topics / Comments
9	M	6-Mar	4		
9	Tu	7-Mar	4	25-26	Exam 1 Solutions / Regrade petitions submitted
9	W	8-Mar	4		ASM implementation, ASM design examples
9	Th	9-Mar	4	27	ASM desigs, ROM based designs & others
9	F	10-Mar	4		RAM/ROM expansion
		11-Mar → 19-Mar			**Spring Break** (no classes or labs)
10	M	20-Mar			ASM design implementations
10	Tu	21-Mar		28-29	Introduction to VHDL
10	W	22-Mar			RAM, ROM PLAs, PALs
10	Th	23-Mar		30	More PLDs (CPLDs and FPGAs)
10	F	24-Mar			
11	M	27-Mar	5		Introduction into computer architecture
11	Tu	28-Mar	5	31-32	
11	W	29-Mar	5		
11	Th	30-Mar	5	33	
11	F	31-Mar	5		
12	M	3-Apr			Introduction into computer architecture
12	Tu	4-Apr		34-35	Addressing modes, Data transfer instructions
12	W	5-Apr	6		
12	Th	6-Apr	6	36	
12	F	7-Apr	6		
13	M	10-Apr	6		Basic computer operation cycles and timing
13	Tu	11-Apr	6	37-38	Instruction set & assembly programming examples
13	W	12-Apr			
13	Th	13-Apr		39	
13	F	14-Apr			**Drop Deadline**: Fri, 14 Apr @ 11:59pm
14	M	17-Apr	7		G-CPU, Special topics
14	Tu	18-Apr	7	39-40	G-CPU, Memory Maps
14	W	19-Apr	7		**Practical 2: Wed, 19 Apr, 8:20pm**
14	Th	20-Apr	7	41	
14	F	21-Apr	7		
15	M	24-Apr			
15	Tu	25-Apr		42-43	
15	W	26-Apr			**UF Classes End**
15	Th	27-Apr	No lab	No class	Reading Day
15	F	28-Apr	No lab	No class	Reading Day
Sat or Mon		29-Apr or 1-May		Final	**Final (Exam 2): TBD,**