EEL 3701C: DIGITAL LOGIC AND COMPUTER SYSTEMS

http://mil.ufl.edu/3701/ @eel3701 *UF's Canvas*

INSTRUCTOR

Dr. Eric M. Schwartz	MAEC 106	352-392-2541	ems@ufl.edu	Office Hours: Wed: 12:50pm, Fri 1:55pm
Dr. Christophe Bobda	LAR 336A	352-294-2024	cbobda@ece.ufl.edu	Office Hours: Mon/Fri: 4:00pm-5:00pm

LECTURES Dr. Schwartz: Tues 4th (10:40am-11:30am) & Thur, 4th-5th (10:40am-12:35pm) in NEB 202
Dr. Bobda: Mon, Wed, Fri, 7th (1:55pm-2:45pm) in WM 100

LAB SECTIONS (NEB 248)
***PI** = Peer Instructor
(PI=UPI=Undergrad PI)

Mon			Tues			Wed			Thur			Fri		
Sec/Cl	Start	PI*	Sec/Cl	Start	PI	Sec/Cl	Start	PI	Sec/Cl	Start	PI	Sec/Cl	Start	PI
5297/ 12344	9:35am	Lysny	29HE/ 12313	9:35am	Marquez	5712/ 12345	9:35am	Lysny	182A/ 12481	9:35am	Blake	9069/ 12346	9:35am	Greg
			1813/ 12480	11:45am	Tomasz									
1496/ 12475	1:55pm	Marquez	174B/ 12478	1:55pm	Kevin	155A/ 12476	1:55pm	Mac	5089/ 12343	1:55pm	Damien	155F / 12477	1:55pm	Blake
2G97/ 12316	4:05pm	Alex	268H/ 12312	4:05pm	Kevin	1491/ 12474	4:05pm	Angela	1811/ 12479	4:05pm	Jaxon	2557/ 12311	4:05pm	Greg
182F/ 12309	6:15pm	Camilo	0F57/ 12445	6:15pm	Jon	1088/ 12446	6:15pm	Angela	2G94/ 12315	6:15pm	Alex			
0279/ 12444	8:20pm	Spencer	182G/ 12310	8:20pm	Oliver	2G72/ 12314	8:20pm	Daniel	1488/ 12447	8:20pm	Frank			

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, 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 at https://tinyurl.com/UF-Lam.

COURSE OBJECTIVES (ABET Design Content 50%) [Lab fee: $117.71]

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 hardware 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), not just the one teaching your lab section, as necessary, for help during their office hours. You are encouraged to use e-mail to communicate with the instructors and PIs. PIs will also hold a few help sessions (also shown at the above office hours link).

Name	Gregory DeCanio	Angela Cook	Kevin Lovell	T. Blake Shaffer	Lysny Woodahl	Alexander Shuping
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EXAM SCHEDULE

Each of our mid-term exams are administered in the evening.

Exam Schedule

Exam	Date	Time	Location
1P	Wed, 9 Oct	8:20pm	MAE A303, NEB 202, NPB 1002
1L	Mon, 14 Oct	8:20pm	WM 0100, WEIL 0270, PUGH 0170
2L	Wed, 20 Nov	8:20pm	LIT 0101, 0109, 0113, 0121
2P	Sat, 7 Dec	TBD	

REQUIRED HARDWARE

The *National Instruments (NI) Analog Discovery 2* (**NAD**) *board* **or** *Digilent Analog Discovery 2* (**DAD**) *board* is required for this course (and many other ECE courses). Board ordering information for the NAD can be found at https://tinyurl.com/NAD-UF-f19 (for $189, all inclusive) and the DAD-2 (for $196.90, all inclusive) at https://tinyurl.com/DAD-UF-f19. If you are an EE student, I recommend that you buy the DAD-2 (from Digilent) and also buy the NI Multisim software (for analog circuit design and simulation, but **NOT** used in our course), available from for $39.99 as an add on. According to the UF bookstore's website, they have the NAD-2 available for $225; this is mostly relevant if you want to use financial aid or want it right away.

SOFTWARE REQUIREMENTS

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, beepers, laptop sound effects, and other noise making devices before entering our classroom. If a noise-making device goes off during class, I reserve the right to lower your course grade. If a noise-making device goes off during an exam, your will lose a significant number of points on this exam.

GRADING POLICY

Grades are periodically posted on the class web site. **It is your responsibility to check your grades regularly** since mistakes often happen when dealing with a large number of students and PI's. **All grades are final one week after posting.** After curving exams 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 the problem you are presented with, 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 5-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.

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 results in a deduction of one point (out of 100) from your overall course total. There are no excuses for missed classes, but two classes can be missed without penalty.

Laboratory	30%*	(Lab values vary, i.e. it could count as 1/3 a lab, a single lab, a double lab, etc.)
Homework/Quizzes	6%	(8-12 homework and 0-5 quizzes)
Exams 1P	27%	
Exams 1L	3%	
Exam 2L	7%	(Lab-like exam, during class time)
Exam 2P	27%	(Paper exam)
Total	100%**	(90+ on combined Exam 2L and 2P 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 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. 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 **your professor** (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 **your professor** at 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. Each missed class results in a deduction of one point (out of 100) from your overall course total. There are no excuses for missed classes, but two classes can be missed without penalty.

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

EXTRA CREDIT

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

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. Scans are acceptable, but must be compressed and in a single document. *Fast Scanner* (available for Android and iPhone) is a cell phone app that works well. Unclear scans **will not** be accepted. Missed homework can**not** be made up, but your lowest homework (or quiz) 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 verbatim; 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. Also, the (pop) quizzes will come from the class material, the labs, **and** the homework. In addition, the exams will be partly based on the assigned homework. Since homework is not returned and is graded only for effort, students should compare their solutions to the posted solutions. **Late homework is not accepted**.

IN-CLASS QUIZ GRADING

In-class quizzes will cover material previously covered in assigned readings, homework, class or lab. Quizzes may happen during any class; they are not generally announced beforehand. **Missed quizzes cannot be made up, but your lowest quiz (or homework) is dropped. Therefore, missing a single quiz will not hurt your grade.** See the Course Requirements section above for the policy for missed quizzes.

EXAM RE-GRADE POLICY

If you believe an error has been made on an exam score you must make a **written** request to the instructor 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, however, the instructor reserves the right to scrutinize and grade the **entire** exam more closely. 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 returned to you.

HOMEWORK AND EXAM SOLUTIONS

Solutions to homework will be made available on our class web site. Practice exams (some old ones with 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. 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 **your professor** (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 **your professor** 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 your professor 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: PI's name, Lab X date (day and date) and time, lab section (4 characters), lab class number (5 digits)
     - Lab X dates (day and date) that you will be **unavailable** for your Lab X.
     - **ALL** of the Lab X dates, periods, and times (day, date, periods, and times) of the lab you will miss for which you **are** available (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 your professor (via email, with subject: ***3701: Conflict with Lab X***, where *X* is the lab number) the course number and 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 class!
2. Class attendance is mandatory. Roll will be taken. Each missed class when roll is taken will cost 1 points (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.
   - ***No excuses accepted, but two free drops.***
   - ***Missed classes and quizzes cannot be made up.***
   - Turn off all cell phones, beepers, laptop sound effects, and other noise making devices **before entering** our classroom. If a noise-making device goes off during class, I reserve the right to **lower your course grade**. If a noise-making device goes off during an exam, your will lose a significant number of points on this exam.
   - If you miss the first two classes and do not notify me, **you will be dropped from the course**.

3. Do all homework assignments and turn them in **through Canvas before** the time that they are due.
   - ***Late homework will not be accepted.***
4. Take all exams as scheduled.
   - ***No makeup exams will be given except in cases of a medically documented incapacity or family emergency.***
   - If you believe that you have a valid exam 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 X***, where *X* is the exam number. Please specify the times of your conflict and then times immediately before or after the scheduled exam 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, www.dso.ufl.edu/drc/) by providing appropriate documentation. 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.

Students requesting classroom, laboratory or exam accommodations must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. For optimal consideration, you must see the professor **during the first week of classes**.

UF COUNSELING SERVICES (HEALTH AND WELLNESS)

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

- University Counseling & Wellness Center, http://www.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.

- **Career Connections Center**: https://career.ufl.edu/, Reitz Union, 392-1601, career development assistance and counseling.
- **University Police Department**: 392-1111 or http://www.police.ufl.edu 9-1-1 for emergencies.

ACADEMIC RESOURCES

- E-learning technical support, https://lss.at.ufl.edu/help.shtml, 392-4357, Learning-support@ufl.edu..
- Career Resource Center, http://www.crc.ufl.edu/, 392-1601. Reitz Union. Career development assistance and counseling.
- Library Support, http://cms.uflib.ufl.edu/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.
- Ombuds office, http://www.ombuds.ufl.edu/. Ombuds office exists to assist students in resolving problems and conflicts

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. Evaluations are typically open during the last two 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/.

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 is strictly prohibited during exams. All use of an electronic devices during an exam 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.

STUDENT PRIVACY
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments.

COMMUNICAITION
Twitter is utilized for course announcements. You are also responsible for getting the tweets either with a Twitter account or with software that creates an email or text message from tweets. 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 notes are normally available from 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 with some space for note taking. 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 bring the **printed** class **notes and examples** to class to augment the printed material with your own notes. Notes will be removed shortly after they are covered in class. I recommend that you bring your laptop or tablet computer (or printed notes) to each class, so that you can easily augment these notes with your own notes. Historically, student that take good notes perform much better in this class then those who do not take notes (or take poor notes).

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."

*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, or exam, etc.), you **will** be prosecuted. A meeting with the instructor (and, possibly, the UF honor court) 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/students/student-conduct-code/. If you have any questions or concerns, please consult with your professor . The flow chart for an honor code violation is available here. A link to report an academic honesty incident is available here.

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.**

INSTITUTIONAL VALUES

1. Always tell the truth.
2. Do not cheat.
3. Attend all classes.
4. Be on time and stay until the end of class.
5. Work hard and consistently.
6. Respect the privilege that goes with being a UF student.
7. Recognize feedback as an opportunity to learn and improve.
8. Do not allow your judgement to become impaired when tired or under pressure.
9. Be thankful for the opportunity that you have that many others wish that they had.

LABORATORY GRADING

You will not be admitted to the lab without a *Summary* document, as described in the *Lab Rules and Policies*. The *Summary* document and other files also **must** be submitted through Canvas **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**. 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 RULES & POLICIES

See www.mil.ufl.edu/3701/admin/Lab_Rules_&_Policies.pdf 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 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 your **your professor** (**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.

You will **not** officially makeup your dropped lab. 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	Start Date	Probable Topic s
0	Mon, 26 Aug	Build your PLD board; intro to software and parts
1	~~Thur, 5 Sept~~ Mon, 9 Sept	Quartus intro; Logic design and implementation (with discrete parts)
2	Mon, 16 Sept	MSI circuit design and implementation (with discrete parts & PLD)
3	Fri, 27 Sept	Counter design and implementation
4	Wed, 16 Oct	Registered Arithmetic Logic Unit (RALU) design & implementation
5	Mon, 28 Oct	State Machine design and implementation
6	Tues, 5 Nov	CPU with ROM-based instructions
7	Wed, 13 Nov	G-CPU simulation and assembly language programming

EEL 3701 Schedule: Part 1 of 2

WEEK/DAY		DATE	LAB #	AM Lecture	PM Lecture	Tentative Weekly Topics / Comments
1	M	19-Aug	No lab	No class	No class	Syllabus, web site
1	Tu	20-Aug		1		Digital Design, Basic logic
1	W	21-Aug			1	Intro. to Quartus
1	Th	22-Aug		2-3		
1	F	23-Aug			2	~~**Drop/Add ends Friday at 11:59pm**~~
2	M	26-Aug	0		3	**Drop/Add ends Monday at 11:59pm**
2	Tu	27-Aug	0	4		Truth (Logic) Table / Voltage Table
2	W	28-Aug	0		4	Mixed Logic
2	Th	29-Aug	0	5-6		ICs, introduction to mixed, positive, and negative logic
2	F	30-Aug	0		5	
3	M	2-Sep	No lab	No class	No class	**Holiday: Labor Day**
3	Tu	3-Sep		7		Number Systems, Math
3	W	4-Sep			6	Boolean Algebra
3	Th	5-Sep	~~1~~	8-9		MSOP, MPOS, Simplification
3	F	6-Sep	~~1~~		7	
4	M	9-Sep	1		8	MSI: MUX, deMUX, decoder
4	Tu	10-Sep	1	10		K Map
4	W	11-Sep	1		9	
4	Th	12-Sep	1	11-12		
4	F	13-Sep	1		10	
5	M	16-Sep	2		11	
5	Tu	17-Sep	2	13		More MSI: encoder, adder, BCD 7-seg decoder
5	W	18-Sep	2		12	
5	Th	19-Sep	2	14-15		Even more MSI: tristate buffer, ALU
5	F	20-Sep	2		13	Introduction to sequential circuits: Flip-flops
6	M	23-Sep			14	**CISE Career Workshop: Sept 23rd, 1-6pm**
6	Tu	24-Sep		16		Flip-flops and next state/excitation tables
6	W	25-Sep			15	**Career Showcase (Technical Day, Sept 25th)**
6	Th	26-Sep		17-18		Design with flip-flop, Counter design, Debouncing
6	F	27-Sep	3		16	
7	M	30-Sep	3		17	MSI sequential circuits - Registers, counters
7	Tu	1-Oct	3	19		RAM/ROM
7	W	2-Oct	3		18	
7	Th	3-Oct	3	20-21		
7	F	4-Oct	No lab	No class	No class	**Holiday: Homecoming**
8	M	7-Oct			19	~~**EXAM 1L: Mon, 7 Oct, 8:20pm, in FLG rooms**~~
8	Tu	8-Oct		22		State Machines
8	W	9-Oct			20	**EXAM 1P: Wed, 9 Oct, 8:20pm, in mult bldgs_**
8	Th	10-Oct		23-24		
8	F	11-Oct			21	

EEL 3701 Schedule: Part 2 of 2

WEEK/DAY		DATE	LAB #	AM Lecture	PM Lecture	Tentative Weekly Topics / Comments
9	M	14-Oct			22	**EXAM 1L: Mon, 14 Oct, 8:20pm, in mult bldgs**
9	Tu	15-Oct		25		Exam 1 Solutions / Regrade petitions submitted
9	W	16-Oct	4		23	ASM implementation, ASM design examples
9	Th	17-Oct	4	26-27		ASM desigs, ROM based designs & others
9	F	18-Oct	4		24	RAM/ROM expansion
10	M	21-Oct	4		25	ASM design implementations, ROM based designs & others
10	Tu	22-Oct	4	28		Introduction to VHDL
10	W	23-Oct			26	
10	Th	24-Oct		29-30		RAM, ROM PLAs, PALs
10	F	25-Oct			27	More PLDs (CPLDs and FPGAs)
11	M	28-Oct	5		28	Introduction into computer architecture
11	Tu	29-Oct	5	31		
11	W	30-Oct	5		29	
11	Th	31-Oct	5	32-33		
11	F	1-Nov	5		30	
12	M	4-Nov	6		31	Introduction into computer architecture
12	Tu	5-Nov	6	34		Addressing modes, Data transfer instructions
12	W	6-Nov	6		32	
12	Th	7-Nov	6	35-36		
12	F	8-Nov	6		33	
13	M	11-Nov	No lab	No lab	No class	**Holiday: Veteran's Day**
13	Tu	12-Nov		37		Exam 2 Solutions / Regrade petitions submitted
13	W	13-Nov	7		34	Basic computer operation cycles and timing
13	Th	14-Nov	7	38-39		Instruction set and assembly programming examples
13	F	15-Nov	7		35	**Drop Deadline**: Fri, 12 Apr @ 11:59pm
14	M	18-Nov	7		36	G-CPU, Special topics
14	Tu	19-Nov	7	40		G-CPU, Memory Maps
14	W	20-Nov			37	**EXAM 2L: Wed, 20 Nov, 8:20pm, in mult bldgs.**
14	Th	21-Nov		41-42		~~**EXAM 2L: Thur, 21 Nov, 8:20pm, in mult bldgs**~~
14	F	22-Nov			38	
15	M	25-Nov			39	**Drop Deadline**: Mon, 25 Nov @ 11:59pm
15	Tu	26-Nov		43		
15	W	27-Nov	No lab	No class	No class	**Holiday: Thanksgiving**
15	Th	28-Nov	No lab	No class	No class	**Holiday: Thanksgiving**
16	F	29-Nov	No lab	No class	No class	**Holiday: Thanksgiving**
16	M	2-Dec			40	G-CPU, Special topics and Review
16	Tu	3-Dec		44-45		
16	W	4-Dec			41	(*Classes End*)
16	Th	5-Dec	No lab	No Class	No Class	Reading Day
16	F	6-Dec	No lab	No Class	No Class	Reading Day
				Final	Final	**EXAM 2P: Sat, 7 Dec, _____, in _____**