

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

LECTURES

Tues & Thur, 5th-6th (2:00pm-4:45pm) in PUGH 170

LAB SECTIONS (NEB 248)

*PI = Peer Instructor
 (PI=UPI=Undergrad PI)

Mon			Tues			Wed			Thur			Fri		
Sec/CI	Start	PI*	Sec/CI	Start	PI	Sec/CI	Start	PI	Sec/CI	Start	PI	Sec/CI	Start	PI
			72H4/ 11639	8:30am	Greg (GD)				7259/ 11636	8:45am	Spencer (SC)	72H1/ 11638	8:30am	Greg (GD)
9118/ 11694	10:00am	Jared (JH)				9122/ 11695	10:00am	Frank (FM)						
74C8/ 11659	1:00pm	Jaxon (JB)	777D/ 11664	11:00am	Damien (DB)	74C9/ 11660	1:00pm	Ming (MY)	777E/ 11665	11:00am	Damien (DB)	71HB/ 11634	11:30am	Ming (MY)
77DF/ 11693	4:00pm	Ming (MY)				7679/ 11663	4:00pm	Alex (AS)				73GB/ 11658	2:00pm	Damien (DB)
7287/ 11637	7:00pm	Frank (FM)	7675/ 11661	7:00pm	Yiyang (YT)	9472/ 11696	7:00pm	Jon (JL)	7677/ 11662	7:00pm	Blake (BS)	71HC/ 11635	7:00pm 6:20pm	Yiyang (YT)

REQUIRED 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: \$118.11]

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	Ming Yang	Damien Bobrek	Gregory DeCanio	Yiyang Tan	Jaxon Brown	Frank Mitchell
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Name	Jon Legaspi	Alexander Shuping	T. Blake Shaffer	Spencer Comora	Jared Holley
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EXAM SCHEDULE

Some of our exams may be administered in the evening.

Help Sessions

Date	Time	Location

Exam Schedule

Exam	Date	Time	Location
1L	Thur, 20 June	2:00pm	TBD
1P	Tues, 2 July	2:00pm	PUGH 170
2L	Tues, 6 Aug	2:00pm	TBD
2P	Thur, 8 Aug	2:00pm	PUGH 170

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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-u19> (for \$183, all inclusive) and the DAD-2 (for \$196.90, all inclusive) at <https://tinyurl.com/DAD-UF-u19>. When purchasing the NAD, other discounted items can be found on the same website. If you are an EE student, I also recommend that you obtain the NI Multisim software (for analog circuit design and simulation), available from Digilent for \$39.99. The UF bookstore has the NAD available, for those that want to use financial aid or want it right away. (Online it says that they have the NAD-2 for \$225.)

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, you will lose a significant number of points on this exam.

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 **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. 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.
 - Provide a list of **all** of the Lab X **days and periods** (see the lab schedule on the syllabus) for which you have no conflict and could attend.
 - 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 (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.
 - 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, you 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**.

RECOMMENDATION

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 than those who do not take notes (or take poor notes).

STUDENTS REQUIRING ACCOMMODATIONS

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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.
- 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 9-1-1 for emergencies), <http://www.police.ufl.edu/>.
- Career Connections Center, <https://career.ufl.edu/>, Reitz Union, 392-1601, career development assistance and counseling.

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.

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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.

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 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.

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 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	4%	(5-12 homework and 0-5 quizzes)
Exams 1P	28%	
Exams 1L	3%	
Exam 2L	7%	(Lab-like exam, during class time)
<u>Exam 2P</u>	<u>28%</u>	<u>(Paper exam)</u>
Total	100%**	(90+ on combined Exam 2L and 2P results in 5% grade bonus, e.g., 86% \Rightarrow 91%)

* 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 **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. Schwartz** 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.

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), 86.6 \rightarrow 89.9 (A-), 83.3 \rightarrow 86.6 (B+), 80 \rightarrow 83.3 (B), 76.6 \rightarrow 79.9 (B-), 73.3 \rightarrow 76.6 (C+), 70 \rightarrow 73.3 (C), 66.6 \rightarrow 69.9 (C-), 63.3 \rightarrow 66.6 (D+), 60 \rightarrow 63.3 (D), 56.6 \rightarrow 59.9 (D-), and 0 < 56.6 (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>.

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 **cannot** 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.**

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.

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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.

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.

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.

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.

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 Dr. Schwartz. 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 and resolve differences. Copying your partner's work constitutes cheating and should not be permitted. Matching your solution to your partner's, however, is acceptable, if, after independent study and work you are convinced your partner's solution is correct. All solutions should reflect your style of problem solving, even those you have changed to match your partner's solution. In other words, **verbatim copying or simple paraphrasing of your partner's solution is not an acceptable form of cooperative study**. Your name **and your partner's name(s)** must be on your assignments. 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

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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.**

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](http://www.mil.ufl.edu/3701/admin/Lab_Rules_&_Policies.pdf) for important information that you should re-read prior to each lab submission.

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 **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.

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	Possible Topic s
0	Mon, 20 May	Build your CPLD board; intro to software and parts
1	Wed, 29 May	Quartus intro; Logic design and implementation (with discrete parts)
2	Wed, 5 June	MSI circuit design and implementation (with discrete parts & CPLD)
3	Thur, 13 June	Counter design and implementation
4	Tues, 9 Jul	Registered Arithmetic Logic Unit (RALU) design & implementation
5	Tues, 16 Jul	State Machine design and implementation
6	Tues, 23 Jul	CPU with ROM-based instructions
7	Tues, 30 Jul	G-CPU simulation and assembly language programming

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EEL 3701 Schedule: Part 1 of 2

WEEK/DAY	DATE	LAB #	PM Lecture	Tentative Weekly Topics / Comments
1	M	13-May		Classes Begin Syllabus, web site Digital Design, Basic logic, Number Systems, Math Intro. to Quartus, Mixed Logic ICs, introduction to mixed, positive, and negative logic
1	Tu	14-May	1-2	
1	W	15-May		
1	Th	16-May	3-4	
1	F	17-May		
2	M	20-May	0	Number Systems, Math Number Systems, Math Boolean Algebra
2	Tu	21-May	5-6	
2	W	22-May	0	
2	Th	23-May	7-8	
2	F	24-May	0	
3	M	27-May	No class	Holiday: Memorial Day Bring your toolbox to class! MSOP, MPOS, Simplification MSI: MUX, deMUX, decoder; K Maps More MSI: encoder, adder, BCD 7-segment decoder, tristate buffer; Arithmetic Logic Unit (ALU)
3	Tu	28-May	9-10	
3	W	29-May	1	
3	Th	30-May	11-12	
3	F	31-May	1	
4	M	3-Jun	1	Introduction to sequential circuits: Flip-flops Flip-flops and next state/excitation tables Design with flip-flop, Counter design, Debouncing
4	Tu	4-Jun	13-14	
4	W	5-Jun	2	
4	Th	6-Jun	15-16	
4	F	7-Jun	2	
5	M	10-Jun	2	IC Characteristics RAM, ROM and memory expansion MSI sequential circuits - Registers, counters Introduction to VHDL
5	Tu	11-Jun	17-18	
5	W	12-Jun		
5	Th	13-Jun	19-20	
5	F	14-Jun	3	
6	M	17-Jun	3	ASM implementation, ASM design examples ASM design implementations, ROM based designs & others ASM implementation, ASM design examples EXAM 1L: 2:00pm in _____
6	Tu	18-Jun	21-22	
6	W	19-Jun	3	
6	Th	20-Jun	23-24	
6	F	21-Jun		
M-F	22-30-Jun		No Class	Holiday: Summer Break

SYLLABUS

Revision 1

EEL 3701 Schedule: Part 2 of 2

WEEK/DAY	DATE	LAB #	Lecture #	Tentative Weekly Topics / Comments	
M-F	22-30-Jun		No Class	Holiday: Summer Break	
7	M	1-Jul		EXAM 1P: in class ASM design implementations, ROM based designs & others	
7	Tu	2-Jul	25-26		
7	W	3-Jul			
7	Th	4-Jul	No Class		
7	F	5-Jul			
8	M	8-Jul		Exam 1 Solutions / Regrade petitions submitted Addressing modes, Data transfer instructions Instruction set and assembly programming examples	
8	Tu	9-Jul	4		27-28
8	W	10-Jul	4		
8	Th	11-Jul	4		29-30
8	F	12-Jul	4		
9	M	15-Jul	4	Basic computer operation cycles and timing Intro into computer architecture, registers, assembly & instructions G-CPU, Memory Maps	
9	Tu	16-Jul	5		33-34
9	W	17-Jul	5		31-32
9	Th	18-Jul	5		33-34
9	F	19-Jul	5		
10	M	22-Jul	5	G-CPU, Special topics	
10	Tu	23-Jul	6		35-36
10	W	24-Jul	6		
10	Th	25-Jul	6		37-38
10	F	26-Jul	6		
11	M	29-Jul	6	TBD DROP DEADLINE	
11	Tu	30-Jul	7		39-40
11	W	31-Jul	7		
11	Th	1-Aug	7		41-42
11	F	2-Aug	7		
12	M	5-Aug	7	EXAM 2L: 2:00pm in _____ EXAM 2P: in class	
12	Tu	6-Aug			43-44
12	W	7-Aug			
12	Th	8-Aug			45-46
12	F	9-Aug			No Class