EEL3744C: Lab Rules & Policies

1. Lab safety is rule #1. Please play close attention to TA instructions about lab safety, which will occur during your first lab.
2. No food or drinks in the lab. (No smoking, i.e., keep the magic smoke inside the ICs.)
3. Students work ***individually*** on each lab project. Do not ask or answer questions from other students during your lab. Students can **NOT** help each other **during** lab. During lab, all questions should be directed to the TA.
4. Unless otherwise told by the instructor or a TA, do **not** use another student's PCB or other hardware at **any** time. Similarly, do **not** use another student's designs or programs.
5. You can **not** use functions like printf, sprintf, or delay when writing in C, i.e., you must write **all the code** yourself (unless the functions are specifically provide to this semester's students by the course instructor).
6. It is your responsibility to return all equipment and clean your work area before leaving the lab.
7. Students must attend labs during their assigned time.
8. Students must come prepared to the Lab. **No student will be admitted to the lab without the pre-lab work already submitted through Canvas, the required printouts in hand, and the required circuits constructed.** Your files must be submitted through Canvas **at least 15 minutes BEFORE the start of your scheduled lab**.
9. If you arrive more than **10 minutes** after your lab begins, you will **NOT BE ELIGIBLE** to take the lab quiz. If you arrive late, but prior to the 10-minute deadline, you may not get any directions for the quiz.
10. If you arrive more than **20 minutes** after your lab begins, you will **NOT BE ADMITTED**. Note that you may not be able to finish your lab if you arrive late.
11. An overall lab grade of 65% or better is **required** in order to be eligible to pass the course.
12. See the course syllabus for information about the **rare cases** when missed labs can be made up.
13. Most labs will have a quiz. Quizzes might take as long as 1 hour (but could be shorter). Quizzes will be graded on a quaternary (also known as a quadrary) scale of 0, 1, 2 or 3. This will translate into values of 0, 15%, 20%, or 30%, respectively to account for up to 30% of the lab grade. Quizzes will cover information from the pre-lab material and previous labs and course work. The items permissible to use during a quiz vary; sometimes you will not be allowed any resources and other times you will be allowed access to your Atmel documents and possibly your own lab software. You will **not** be allowed to access the internet during quizzes.
14. Labs are precisely 115 minutes long (i.e., 2 periods plus the 15 minute break). You will be given **no** extra time. (All ECE labs, starting spring 2018, are 2 periods, not the 3 periods previously allocated.)
15. Students **must** be prepared to demo their lab when they enter. Students are **randomly selected** to demonstrate her/his lab work at **any time after the lab quiz is over**. Each student has only a single attempt to demonstrate his/hers work, i.e., the TA will **not** come back to you later. There will be **NO** exceptions.
16. A pre-lab report (also known as the lab document) is required for **EVERY** lab, including lab 0. The report must be computer-generated (even if it may include some scans) and should **ALWAYS** include the following:
    a) Title. Put the lab number, your name, and your lab section at the beginning of every pre-lab report.
    b) Answers to all pre-lab questions. Most labs will have several pre-lab questions. Put all answers in this section.
    c) Problems Encountered. Describe any problems you had with getting the lab to work. If you fixed the problems, document your solutions and techniques and what else you tried. If you could not solve the problem and want our help, please state what you have tried and what is currently working and not working. The TAs will not help you during the lab unless you have this section. Even if you fixed the problem, this section will help you in the future if you run into a similar problem.

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d) Future Work/Applications. Given more time (or ambition), how could you adjust your work on this lab for another purpose or with different hardware? Think about how what you did connects with specific applications or a different way of doing the lab. This should be a short description.

e) Schematics. You must submit a **comprehensive and complete** schematic every time you add/modify hardware on your board. (You will add to the schematic throughout the semester.)
   1) Whenever you wire-wrap or connect something on your board you should have a schematic. It should label the identity of devices connected (e.g., resistors and value, IC and package). All pins you connected and did not connect should be labeled with their pin numbers and any physical differences in pinouts should be noted. Therefore, you should find and read the relevant datasheets and transfer the relevant information to your schematic. Like flowcharts or pseudocode for software, schematics should be created in the planning stage of the lab, not after the fact!
   2) The schematic should be simple, but clear enough so another classmate could correctly construct it without referring to any datasheets. You can use a software program of your choice (MultiSim, Altium, Eagle, OrCad, Cadence, PSPICE, ...). Using a circuit design software program has a twofold benefit: it allows you to gain experience expected in industry and your design will look clean. If you create your schematic by hand or with drawing software (like PowerPoint, Word, or Visio), it should be readable and clear.

f) Pseudocode/Flowcharts. You must submit either a flowchart or pseudocode for **EVERY** (even very simple) part of the lab.
   1) Pseudocode: Wikipedia (http://en.wikipedia.org/wiki/Pseudocode) tells us that "Pseudocode is a compact and informal high-level description of a computer programming algorithm that uses the structural conventions of a programming language, but is intended for human reading rather than machine reading."
   2) Flowchart: Each element in a flowchart should correspond to a section of code beginning with a label or a specific function. This should be done **before** you begin coding. You can always edit it, if necessary. For symbols used in making classic flowcharts see the textbook or see http://en.wikipedia.org/wiki/Flowchart#Symbols.

g) Program Code. Submit your main ASM, C, and/or header file(s) for every part of the lab. Include all supporting asm/libraries in the appendix.
   1) All code should be commented to a level that anyone can readily understand the purpose of each section, if not each line of code. At the beginning of the semester, points will be deducted if comments are not on almost every line. Obviously, as you progress through the semester, simple instructions do not require a line-by-line comment, but the purpose of a set of instructions should always be clear.
   2) Each ASM or C program should begin with a proper heading (described later).
   3) Each subroutine, function, or interrupt service routine should describe its function and what parameters are passed into and out of the routine. Also, describe what registers or variables are altered in the routine.
   4) Copy and paste your code into your lab document. (Screen shots are **NOT** allowed!) Make sure that your program is inserted in a readable format with **no wrapping lines**, which break up the assembly instructions and comments. Change the font size if necessary.

h) Appendix. Include all supporting ASM, C, or header files that you used in your main programs. Also include any other relevant information.

17. Students must **ALWAYS** turn in **physical copy**, i.e., a printout, of sections a) through d) of the pre-lab report (described above) for **EVERY LAB**. It will be returned to you during your next lab with your lab grade. (This is sometimes referred to as the **Summary** document, although it is only a part of what will be

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submitted online.) Your **entire lab report** must submitted through **Canvas** (along with other files discussed below) **at least 15 minutes BEFORE the start of your scheduled lab**.

18. Students must submit copies of all required deliverables through Canvas **BEFORE** the start of **EVERY** lab.
    a. Canvas Submission Content:
        1) Your entire pre-lab report. Submit a single **pdf file only**. The file name should be **`lab#.pdf`**, where **#** is the lab number, as specified in Canvas. (Canvas may append a number to your file name. This is okay and cannot generally be avoided.)
        2) All of your ASM, C, and/or header files. For all individual ASM, C, and/or header files, use file names as specified in Canvas, usually something like **`lab#p.asm`** or **`lab#p.c`** where **#** is the lab number and **p** is the part of the lab, e.g., **`lab3a.asm`** or **`lab6b.c`**.
        3) **Failure to follow the lab file naming requirements will result in a 10 point (out of 100) reduction in your lab grade. NO spaces or other characters that are not specified are allowed.**
    b. Format of Deliverables:
        1) All design files (ASM, C, H, BDF, VHDL) must have the following text at the top left with the format given below, but replaced with your personal information. All labs, starting with lab 1, will have design files. Design files without the below information **will NOT be accepted**.
            - `Lab 3 Part 7`
            - `Name:  Al E. Gator`
            - `Section #:  3742`
            - `TA Name:  Clem`
            - `Description:  This circuit uses a widget to generate a whatsit.`
        2) All ASM and C files must be **FULLY COMMENTED**. The TA's will not give credit if there are no comments. This applies to both pre-lab and in-lab material.
        3) Each submitted have the file name specified in Canvas. (Usually file names are specified as **`lab#p.asm`**, where **#** is the lab number and **p** is the part of the lab, e.g., **`lab3a.asm`** and **`lab3b.asm`** for parts A and B of lab 3.)
19. If you have a soldering iron and solder from *Intro to ECE*, do **NOT** use it without explicit instruction from your TA. (Mixing solder types may lead to unreliable connections; poor soldering irons and soldering technique can burn PCB traces.)
20. The TA is generally not available for questions during the lab periods. Questions should be asked **prior** to a student's lab, during TA or faculty office hours.
21. Laptop computers are required for all College of Engineering courses and you are required to bring your computer to your 3744 labs. If you have computer problems before lab, it is **your responsibility** to find a temporary replacement.
22. Students are given a tool box in 3701; use it for 3744. Almost all of the components that you will need for the entire semester will be distributed during your first lab (or you already have them from 3701). A few other components may be **borrowed** for a single lab only and returned at the end of your lab period. You must bring all the parts and tools that you will need to complete the lab.
23. The 3744 lab will generally not replace damaged components, so be careful! In the event of a broken part, it is the student's responsibility to find an equivalent part. Eric Liebner, in NEB 236, can help you with replacement parts, but **consult with your TA first**. Eric may give you a replacement part until a new part (that you purchase) arrives, at which time you will give him the new part, unopened, and still in the box. (If Eric can't be found, go to Michael Stapleton in NEB 239.)
24. Read this document **once and then read it again just before submitting each of your documents, especially for the first several labs**. Failure to understand the rules is a leading cause for poor lab grades in the early labs.