

The following is the set of lab rules, policies, and guidelines which must be strictly followed by all students of *Digital Logic and Computer Systems* throughout the **entirety** of the semester. As a student of *Digital Logic and Computer Systems*, you, must sign, date, and submit a PDF format copy of this document with the first lab assignment via the *Canvas* educational platform no later than your assigned due date for that assignment; until such time as you meet this requirement, you will be subject to receiving a grade deduction on homework assignments, as well as being subject to “no admittance” into any lab sessions. You agree that your electronic signature on this document shall be deemed an original signature for all intents and purposes.

Notwithstanding anything set forth herein, these lab rules, policies, and guidelines shall be subject to written revision at the sole discretion of the instructor, or of the Undergraduate Peer Instructors (from here on referred to as **UPIs**, **PIs**, or Peer Instructors) deemed qualified by the instructor from time to time. If at any time the student has any questions or concerns regarding the subject matter of this document, it is the responsibility of the aforementioned student to speak with the instructor.

Interpretation and enforcement of these lab rules, policies, and guidelines shall be at the sole discretion and determination of the instructor, or of any of the Peer Instructors deemed qualified by the instructor. Furthermore, the rules and policies laid out in this document may extend to any and all situations relating to the lab, e.g., lab exams, whether or not the student is physically located within the lab room.

1. Lab safety is always of utmost importance. It is required that the student uphold any rules regarding safety imposed either as set forth in this document or as announced or otherwise noted by the instructor or Peer Instructors within a lab setting.
2. The student must not bring any food, drinks, or illegal substances into the lab.
3. **It is required that the student work individually on all lab assignments, with the exception that help may be solicited from either the instructor or from the Peer Instructors, when deemed appropriate by the instructor or Peer Instructors. Additionally, the student may solicit help from others in regard to general concepts, although the student may NOT copy or use another individual’s (e.g., a present or past student’s) intellectual property. The term *intellectual property* as used herein shall be deemed to include, but is not limited to, hardware and software designs, in part or in whole.**
4. The student understands that the only valid interpretation of any of the lab documents is from that of either the course instructor, or of any of the Peer Instructors deemed qualified by the instructor. The instructor may select any number of Peer Instructors to act on his behalf, for whatever purpose, at any point within the semester. It is the responsibility of the student to speak with the instructor, or with any of the PIs, to confirm that their understanding of the given materials is correct.
5. **Unless given written permission by the course instructor, each lab assignment must be completed and submitted prior to a lab session. These submissions are otherwise known as pre-lab assignments. The student must submit the following deliverables through *Canvas* at least fifteen minutes prior to the beginning of their scheduled lab section time. Only submissions posted before the relevant deadline will be graded. Furthermore, if the student does not post a submission for the lab assignment by the relevant deadline, or if a submission is posted following this deadline, the student will not be admitted into (or will be removed from) the relevant lab and will receive absolutely no credit for that and any related (e.g., quiz) assignment.**
 - i. A computer-generated **pre-lab report** (also known as a **lab report**). Each pre-lab report must be submitted as a single file in PDF format, and must consist of the following, in the same order provided below:
 - a) A computer-generated **pre-lab report** (also known as a **lab report**), submitted as a single PDF file (named *labN.pdf*, where *N* should be replaced with the relevant lab number), following the relevant lab document(s) and **using the lab template provided on the course website**. The provided submission template includes a header that the student must accurately fill in, as well as the following sections. (If any of the following sections do not apply for a specific lab, the student must write “N/A” following the relevant section heading.)

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- b) **Title.** In this section, the student must put the relevant lab number and title, their name, their lab section, their PI's name, and a relevant date in the heading on the first page of the pre-lab report.
 - c) **Pre-lab Questions or Exercises.** Most labs will require responses to pre-lab questions or exercises. In this section, the student must copy any of the provided exercises, and include a response for each, where the response must directly follow the copied exercise text.
 - d) **Problems Encountered.** In this section, the student must describe any problems that were encountered when attempting to complete the lab. For any problems resolved, the student must document their solutions and techniques attempted, including any solutions that did not resolve the initial problem. For any problems unresolved, the student must state what was tried, as well as state which aspects of the required pre-lab function and which aspects do not function.
 - e) **Future Work/Applications.** In this section, the student must describe *briefly* how, if provided with more time (or ambition), the work in the pre-lab could be extended for another purpose, where the possibility of different hardware and software would be permitted.
 - f) All **schematic** (.bdf) files 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 schematic (.bdf and/or .vhd) and simulation (.vwf) files.
 - * Lab 3 Part 7
 - * Name: Al E. Gator
 - * Section #: 3742
 - * PI's Name: Tim Tebow
 - * Description: This circuit uses a widget to generate a whatsit.Schematic (bdf) files without the above information **will NOT be accepted**.
 - 1) When relevant, put the equation on the schematic.
 - 2) **VHDL** files should contain similar information in comments.
 - 3) **ASM** (assembly language) files (and the associated **mif** files) should contain similar information in comments.
 - g) Whenever your design is with discrete components on a breadboard, entirely inside the PLD, or both, you must have a schematic. It should label the identity of devices connected (e.g., resistors, switches, and LEDs, ICs, etc.). All pins you connected should be labeled with their pin numbers. Therefore, you should find and read the relevant datasheets and transfer the relevant information to your schematic.
 - 1) The schematic should be simple, but clear enough so another classmate could correctly construct it without referring to any datasheets.
 - 2) Generally, you should use Quartus to design your circuits (although Quartus will not be useful for switches, LEDs, and resistors, which will need to be drawn separately or on top of the Quartus bdf design).
 - 3) All schematics must be readable and clear.
 - h) Every **simulation** file/screenshot must be **meaningfully** annotated. The purpose of the annotations is to demonstrate to the instructor or PIs that the design is correct. Simulations with incoherent or nonexistent annotations will not be accepted.
 - 1) When you create a simulation, organize your signals in a way that makes sense. Typically, this means (from top to bottom), special signals first (e.g., Reset, CLK, etc.), inputs next (MSB to LSB), and outputs last (MSB to LSB).
 - 2) Signals should be grouped appropriately (and often by bus). For example, if you have a simulation for a multiplexer (MUX), you should NOT group S1, S0, D3, D2, D1, and D0 as a single group called "inputs." Instead, you should group them (as you would on paper) as S[1:0] and D[3:0].

- 3) If the simulation type is not specified, it is okay to submit a functional simulation for purely combinatorial problems. For sequential circuits, always submit timing simulations.
- 4) When the number of inputs gets very large (more than five), simulations generally do not show all possible input combinations, but only a subset of input values.
 - i. Representative cases that demonstrate the proper functionality of your device (e.g., and ALU) should be such that it demonstrates that your design works as expected.
 - ii. For example, if $A = B = 0011_2$, then $A \text{ AND } B$ and $A \text{ OR } B$ are the same thing (i.e., A). These tests therefore do not give much useful information. Therefore, this is a **BAD** choice.
 - iii. On the other hand, if A and B are different, it may be clear at least that the AND and OR functions result in possibly different values. Note that a single test is not conclusive of the proper functioning of a circuit.
- 5) Simulations that do not follow these requirements in will be penalized accordingly.
 - ii. **Quartus archive file(s).** Quartus archive files contain all Quartus design and simulation files. Each lab archive file submitted on Canvas must have the following format: **Lab#p.qar**, where **#** is the lab number and **p** is the part of the lab. For example, **Lab3b.qar**, would be the archive file for lab 3, part b.
 - iii. **VHDL files.** Submit these files when utilized.
 - iv. **Assembly language (asm) files and memory initialization (mif or hex) files,** Submit these files when utilized.
6. The student should only ask the relevant personnel (the course instructor or any of the Peer Instructors) questions regarding a pre-lab *outside* of a lab section, as there shall be no guarantee that a Peer Instructor can attempt to answer question while hosting a lab period. Separately, the student should only ask questions regarding in-lab requirements while attending their lab section, with exception to content related to in-lab procedure specified within a lab document.
7. The student must come to the lab *prepared*. More specifically,
 - a) The student must understand all content related to the relevant pre-lab to the best of their abilities, where the instructor and/or any relevant Peer Instructors shall be the pertinent judge(s) of whether or not this requirement is upheld by the student.
 - b) Unless given advance permission by the instructor or by a Peer Instructor, the student may **NOT** use another student's hardware at any time.
 - c) The instructor and PIs reserve the right to rescale a lab that earns less than 50% to a 0 if they believe that sufficient effort was not put into the assignment
 - d) The student must have already submitted their pre-lab report through Canvas at least fifteen minutes before their scheduled lab section, and if appropriate, have any required hardware and software constructed.
 - e) The student must bring their entire lab kit, a **Diligent Analog Discovery (DAD)**, a toolbox, and a laptop computer, to all lab sessions. Moreover, there shall be no acceptable excuse for not bringing the aforementioned items; if the student cannot bring one or more of their own materials, it is their responsibility to find a temporary replacement, as well as alert their PI of the situation. Ultimately, the course instructor, or the Peer Instructor(s) responsible for the student, have complete authority to decide whether or not a student meets the aforementioned criteria; if the materials brought by the student are deemed unsatisfactory, the course instructor or the relevant Peer Instructor(s) have discretion to either deduct points from the relevant lab grade or to choose not to admit the student into the pertinent lab session.
8. The student must attend labs during their assigned time. If the student arrives more than **twenty minutes** after their lab begins, they will **NOT** be admitted to the lab room. In a *few rare cases*, labs can be made up; for more information regarding these situations, see the course syllabus.

9. Lab sessions are precisely **115 minutes** long in duration. Only with exception made for the event in which the course instructor and/or Peer Instructor(s) cause a delay for the student, the student must complete all requirements imposed within the lab session during the aforementioned time allotted.
10. Most labs will have a quiz. Quizzes will be used to assess the student's understanding of material related to the completed pre-lab and any completed lab, and may take as long as an hour and a half. The items permissible for use during a quiz may vary, where the course instructor or Peer Instructor(s) define this set of items. The student is responsible for completing all quizzes given. If the student arrives more than **ten minutes** after their lab begins, they will **NOT** be eligible to take the lab quiz. If the student arrives late, but prior to the ten-minute deadline, they may not receive any directions for the quiz.
11. **A weighted lab average of at least 65% must be achieved by the student in order for the student to be eligible to pass the course.**
12. It is the responsibility of the student to return all equipment and clean any pertinent work areas before leaving the lab. Failure to do so will result in at least a ten-point deduction from the relevant lab grade.
13. If the student is to perform any hardware construction with any equipment not provided within the lab, it is the responsibility of the student to verify with either the course instructor or any of the Peer Instructors that the chosen equipment is appropriate. Moreover, the use of the soldering iron and solder provided from the *Introduction to ECE* course within the Electrical & Computer Engineering Department at the University of Florida is **prohibited** (since it is inadequate for our purposes and may damage our PCBs).
14. In the event of a broken part, it is the student's responsibility to find an equivalent part. The *Lab Engineer*, Eric Liebner (whose office is located in NEB 236), or the *Engineering Supervisor*, Michael Stapleton (whose office is located in NEB 239), can help the student with replacement parts, but the student must always **consult with the course instructor and/or Peer Instructor(s) first**. If a replacement part is given to the student, the student may need to purchase the same (or similar) component, as to replace the one provided.
15. The student is **not** allowed to use any pre-built devices where the intention is to have you design them yourself.
16. It is **required** that the student read this entire document before submitting any pre-lab assignment and before attending any lab session. Failure to follow or correctly understand any of the above rules and policies may result in a point deduction of any amount from a lab grade, where this point deduction may be determined by either the course instructor or any Peer Instructor(s) deemed qualified by the course instructor.

By signing this, the undersigned student acknowledges and affirms that he/she has read and understood the same and hereby certifies and agrees that he/she will abide by all lab rules, policies, and guidelines set forth within this document.

Signature of student

Date