

The following is the set of lab rules, policies, and guidelines which must be strictly followed by all students of *Microprocessor Applications* throughout the **entirety** of the semester. As a student of *Microprocessor Applications*, you, the student, 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 the 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 all 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 in 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. Unless given advance permission by the instructor or by a Peer Instructor, the student may **NOT** use another student’s hardware at any time.
5. 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.
6. The student must submit the following deliverables through the *Canvas* educational platform **at least fifteen minutes** prior to the beginning of their scheduled lab section time, including the first lab, in the same order provided below.
  - i. A computer-generated **pre-lab report** (also known as a **lab report**), submitted as a single PDF file, using **the lab template provided on the course website**. The 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.)
    - a) **Requirements Not Met.** In this section, the student must briefly list any lab requirements that were not fully completed, if applicable.
    - b) **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.
    - c) **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. This section of the report, as well as all other sections listed previously, must be limited to the first page of the relevant document, and a page break should follow.

- d) **Pre-lab Exercises.** Most labs will require responses to pre-lab 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. A page break should follow this section.
- e) **Pseudocode/Flowcharts.** The student must submit either a flowchart or pseudocode for **every** (even very simple) part of the lab that requires software to be developed, where either of the aforementioned must be created **before** the software is written. A page break should follow this section.
  - 1) *Pseudocode.* In accordance with the *Wikipedia* [definition](#), **pseudocode** is defined here to be a compact and informal high-level description of a computer programming algorithm that uses structural conventions of a programming language, but is intended for human reading rather than machine reading.
  - 2) *Flowchart.* In accordance with the *Wikipedia* [definition](#), a **flowchart** is defined here to be a type of diagram that represents an algorithm, workflow or process. For the purposes of this course, a flowchart should be created for each routine (or function) of a given program. A list of common symbols used in flowcharts can be found in the course textbook or at the following *Wikipedia* [webpage](#).
- f) **Program Code.** In this section, the student must submit all program code files created for the pre-lab, with exception to library header or source files, by directly copying code from the relevant integrated development environment [IDE] (e.g., *Atmel Studio*) and pasting it into the pre-lab report, where the pasted code must be in an easily readable format with no wrapping lines. In other words, the student must not take a screenshot of the code but copy and paste the text formatted by the relevant IDE into their pre-lab report. Additionally, the student must organize all pasted code within the pre-lab report based on the sections defined in the lab document. A page break should follow this section.
  - 1) All program code should be commented (using method[s] inherent to the relevant programming language) to a level at which anyone with a similar or higher skill level could readily understand the purpose of each section within the program.
  - 2) All code files must contain information at the top left of the file describing the file as well as identifying the student, following the format given below.

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<lab #>, <pertinent section # of lab>  
Name: <student name>  
Class #: <5-digit class id>  
PI Name: <name of Peer Instructor>  
Description: <description of file>
```
  - 3) Each subroutine, function, interrupt service routine, macro, etc., should be prefixed with text describing the routine, including a description of any parameters or return values.
- g) **Appendix.** In this section, the student must include all supporting files referenced or created for the pre-lab, e.g., source and header code files. The student must also include any other relevant information within this section, e.g., analysis measurements, screenshots, or anything else required within the pertinent lab document.
  - 1) All included measurements, screenshots, etc., must be followed with a relevant and descriptive caption. Additionally, if a screenshot depicts any kind of computer-generated file that can support user-specified text, e.g., a block diagram file for a device such as a complex programmable logic device (CPLD), the file (and thus screenshot) must contain a heading following the format provided in item two of section 6f.
  - 2) All measurements taken with an oscilloscope, logic state analyzer (LSA), or anything similar must utilize a correct time base, i.e., if a non-periodic waveform is measured, the relevant waveform must be

- displayed on at least 75% of the measurement window, and if a periodic waveform is measured, at least two and no more than three periods of the waveform must be displayed on the entirety of the measurement window.
- 3) Whenever frequency measurements are of interest, only an oscilloscope (not a logic state analyzer) should be used to perform the measurements. Moreover, if a precise frequency is desired, no manual measurements of a waveform are allowed, e.g., user-defined cursors. See the following links to GIF files published on the course website for allowable methods of measuring a precise frequency of a waveform within the *WaveForms* software: [GIF1](#) and [GIF2](#).
- ii. All files created for the relevant pre-lab, including but not limited to header and source files for assembly and C programming languages.
    - a) If a filename is explicitly specified for some pertinent file within a lab document, the student is **required** to use this exact filename; failure to follow this requirement will result in at least a ten-point deduction from the relevant lab grade.
    - b) All code files must contain comments (using method[s] inherent to the relevant programming language) for all sections of the pertinent program.
    - c) All code files must contain information at the top left of the file describing the file as well as identifying the student, following the format given in item two of part 6f.
    - d) All code files must not be blank nor only contain comments.
  7. 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.
  8. The student must come to the lab **prepared**. More specifically,
    - i. 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.
    - ii. 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.
    - iii. The student must bring their entire lab kit, a **Digilent 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.
  9. 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.
  10. 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.

11. 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.
12. **An overall lab quiz grade of at least 60% must be achieved by the student in order for the student to be eligible to pass the course.**
13. 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.
14. 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).
15. 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.
16. Whenever writing software with the C programming language, the student must additionally uphold the following guidelines.
  - i. Wherever applicable, the use of directives, group configurations, bitmasks, and macros defined within *Atmel* library files or within library files provided on the course website, is required, unless otherwise noted within a lab document.
  - ii. The use of any functions or macros defined within the C standard libraries (e.g., `_delay_ms`, `_delay_us`, `sprintf`, `printf`) is **strictly prohibited**.
  - iii. All software should be compiled with no optimization, unless otherwise noted in a lab document.
17. 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.

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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.

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*Signature of student*

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*Date*