University of Texas at El Paso

Electrical and Computer Engineering Department

EE 4178 – Laboratory for Microprocessors II

Fall 2021

COURSE INFORMATION:

Room:	Engineering Building E340
Course Designation:	EE4178
Credit Hours:	1
Catalog Description:	Assembly language programming, C programming, basic computer architecture, introductory course on embedded system design.
Prerequisite:	EE3176, EE3376, each with a grade of "C" or better.
Website:	Please check Blackboard

INSTRUCTOR INFORMATION:

Instructor:	Hector Erives, Ph.D. & Mirza Mohammad Maqbule Elahi, MS
Meeting Time & Place:	Thursday 10:30AM – 01:20PM Friday 01:30PM – 04:20PM
Office:	Engineering Building E307
Office Hours:	Tuesday & Friday 11AM - 12PM or by appointment.
E-Mail:	melahi@miners.utep.edu

TEXTBOOK & REFERENCES:

ESP32 Technical Reference Manual (espressif.com)
The FreeRTOS Reference Manual (www.freertos.org)

COURSE MATERIALS:

- ESP32-WROOM-32 kit (Students must have their own)
- Lab Notebook: Composition Notebook recommended
- ECE Vectra Lab Student Computer Account (For help contact System Admin Nito)

GRADING:

There are 100 possible points total in Lab. Below are the possible scores and the equivalent letter grade:

A:	90+ points
B:	80 – 89 points
C:	70 – 79 points
D:	60 – 69 points
F:	< 60 points

LAB GRADING ALLOCATION:

Here is how Lab Points are earned (subject to change):

Pre Lab **5%**

Demonstration **30%**

Report **25%**

Code **20%**

Final Project **20%**

DUE DATES:

Generally, late work will **NOT** be accepted. You will have until the first hour of the following lab period to demonstrate that your completion of the lab. Reports will be due by Saturday, 11:59PM.

Even if you are unable to complete the lab, you will have some options to recover some points:

Semi-functional (2 points): Demonstrate that you were able to get the lab to function in some significant capacity. Must demonstrate during the first hour of the following lab session.

Code-Only (1 points): Upload your code with comments in blackboard (source files **ONLY**: main.c, along with your report in .docx format).

Do nothing: You will lose all points for the demonstration if you do nothing or are absent. See the **Extensions** section for special cases.

LAB REPORT AND CODE GUIDELINES:

- 1.5 - 2-page, single-spaced, 12 pt. font, lab report.
- Student Name
- Course title, Lab title, and Date
- Brief paragraph describing purpose of the lab
- List major lab steps
- Brief description of what you learned, issues you had, and how you fixed them.
- Conclusions
- Do not fluff your report with code. Reports will be graded based more on content than length.

MATERIAL SUBMISSION GUIDELINES:

All materials will be turned in **via Blackboard**, **DO NOT PRINT THEM**. When submitting your report or code (source files **ONLY**), please use the following file naming convention:

Student Name – Lab Number – EE3176 Meeting Day.ext

For example:

Jose Sandoval – Lab 3 – EE4178 F.docx

Jose Sandoval – Lab 3 – EE4178 F – main.c

Jose Sandoval – EE4178 F – Lab3.zip

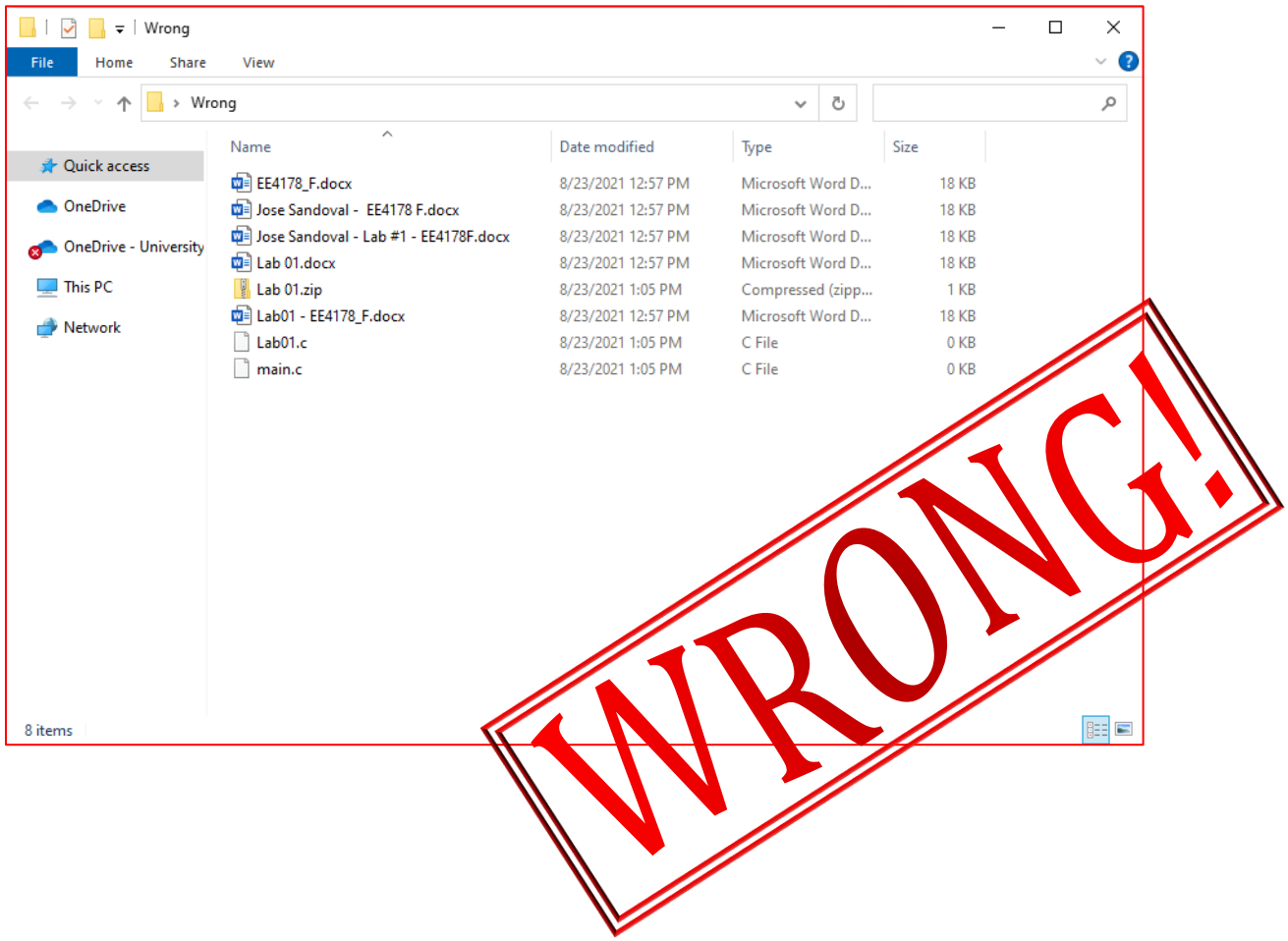
Do not include special characters '!', '?', '#', '$', '%', '&', etc).

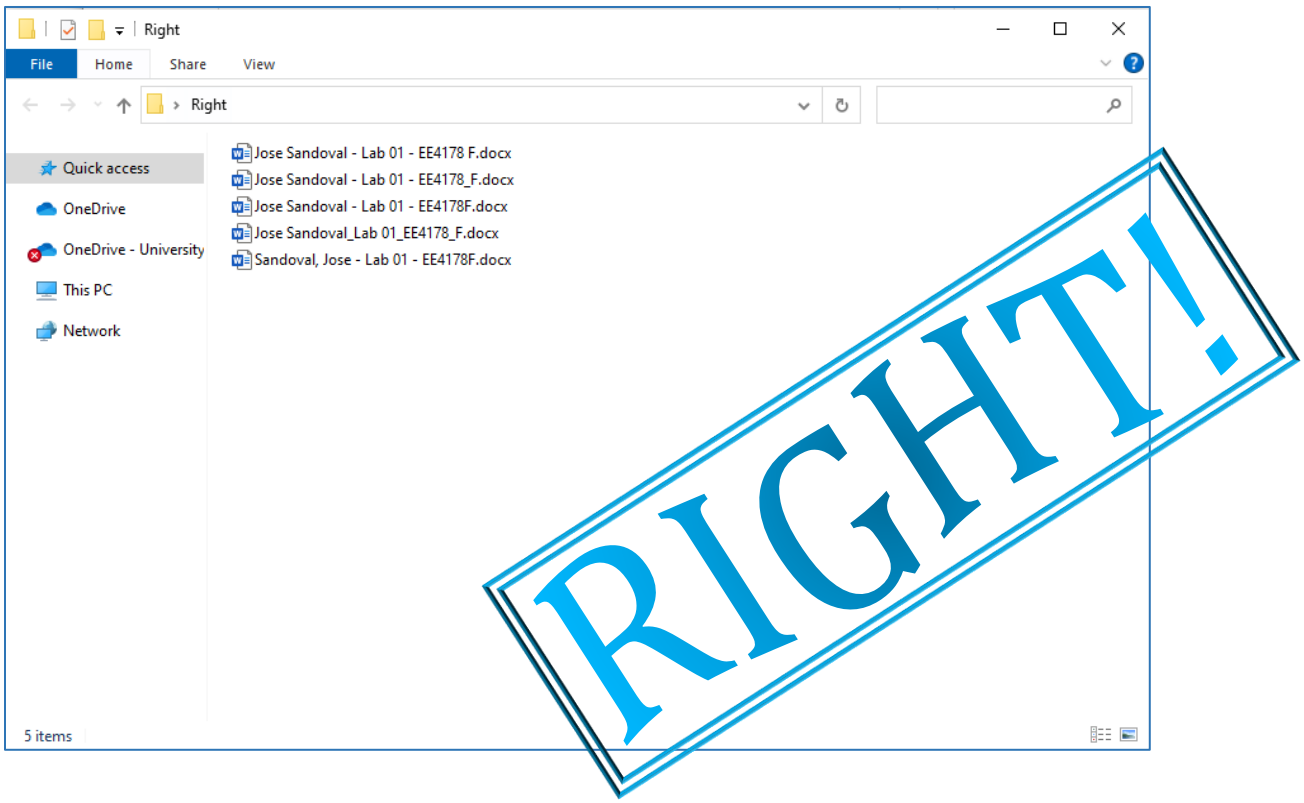
Please submit reports in Word document formats ONLY (.docx ***ONLY***, not .doc) along with your source file main.c

The best method for submitting reports and other material is by using the Blackboard. **Email is for special cases.**

You may also, on occasion, submit materials to my email (melahi@miners.utep.edu) with Subject: "EE4178 Fall 2021''. However, it is more difficult to keep track of submissions this way.

See below for important examples of **Correct (Right)** and **Incorrect (Wrong)** file submissions:





If you fail to name your files correctly, they will be ignored and no credit will be given.

LAB SESSIONS:

Topics and peripherals you will be expected to demonstrate throughout the semester as well as the Final Project:

- Lab 0: Introduction to FreeRTOS
- Lab 01: FreeRTOS, Tasks and Semaphores
- Lab 02: GPIO, Interrupts, and Queues
- Lab 03: Peripherals and Queues:ADC and PWM (LEDC)
- Lab 04: DAC Peripheral
- Lab 05: WIFI and IOT
- Lab 06: WIFI and IOT: Servo Motor Control
- Lab 07: WIFI and IOT: ADC Monitor

FINAL PROJECT:

After or around Lab 3, the Final Project design requirements will be given to you. You must demonstrate all techniques learned during the lab. You will lose points for techniques not demonstrated or ignored.

By this time, you will be expected to have a fair understanding of all concepts, and as such, I will only be providing troubleshooting assistance. **No questions regarding fundamentals or lab topics will be answered**.

Only undergraduate students are allowed to make a team, graduate students will do individual projects. If you feel you are going to drop the lab, do not abandon your teammates at the last minute.

Please make sure you understand all topics before the finishing Lab 7.

EXTENSIONS:

Generally, you will be allowed to checkout anytime during the week without loss of points; you may checkout by the end of lab time in any section, by the first half hour of your section's next meeting, or during office hours. The first half hour of your section's next meeting is for setting up and checkout only, not to receive help.

If you feel you might not be able to make a due date, please let me know before the due date passes. Come by during office hours or send me a message so that we can make arrangements.

Should a catastrophe occur during the due date, you may let me know up 24 hours passed for the possibility of full credit.

FEEDBACK:

If you would like a critique on your reports or have general questions about your grade, you may visit during office hours or send me a message at any time.

MISCELLANEOUS:

You may attend any lab session, provided there is room. However, you will be responsible for the due dates of your assigned meeting date.

Food and Drinks are NOT ALLOWED in the lab. You will be reported to the authority if food and drink are found to be yours.

Reports are to be submitted via Blackboard. **DO NOT ATTEMPT** to submit a purposely corrupt file in order to buy time. This is obvious and is considered academic dishonesty and will be reported to the Dean as such.

Do not borrow code. Write it yourself as questions about your code and technique will be asked.

Try and read the Lab information before coming to class. It will make the lab go by smoother.

Please read the manual thoroughly, you will find tons of useful information.

Use Blackboard to keep track of due dates and other important information.

Follow the directions in the messages in Blackboard or other emails that are sent.

COVID-19 PRECAUTION STATEMENT:

Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to covidaction@utep.edu, so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID-19 testing.

The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way that Miners can take care of Miners is to get the vaccine, practice social distancing, and wear face masks. If you still need the vaccine, it is widely available in the El Paso area, and will be available at no charge on campus during the first week of classes, with additional $25 in Miner Bucks if you take the shots between Aug 23 And Oct 31. For more information about the current rates, testing, and vaccinations, please visit epstrong.org.

If you have any questions, feel free to ask at any time!

SEE YOU IN THE LAB!