

**San José State University**  
**Charles W. Davidson College of Engineering**  
**DEPARTMENT OF ELECTRICAL ENGINEERING**  
**EE120L - Microprocessor Based System Design Laboratory,**  
**Section 04, Fall 2021**

**Course and Contact Information**

Coordinator:	Prof. Binh Le
Instructor(s):	Ziyin Zhang
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Office Hours:	Thursday, 4:45PM - 5:00PM
Class Days/Time:	Thursday, 2:15PM - 4:45PM
Classroom:	Engineering Building 307
Prerequisites:	EE 118 (with grade of “C-” or better) EE 120L (to be taken concurrently) Knowledge in computer programming and software development Good skills in C programming Advanced knowledge in number systems and basic logic components

**Course Description**

EE 120 Laboratory is part of the EE 120 course. Students taking EE 120 are required to register for one lecture section and one laboratory section. At the end of the semester, laboratory work will be integrated with the lecture one to determine EE 120 course grade. There will be no grade/pass/non-pass for the laboratory, but students must complete the laboratory in order to complete EE 120 course.

Major activities of EE120 laboratory are listed as below:

- Use of the software development tool to explore microprocessor architecture, addressing modes, instruction set, memory, and I/O.
- Develop Assembly and C/C++ programs to control an embedded microprocessor-based system such as a robot.
- Implement circuits (hardware and software) to interface a microcontroller-based system to an external device.

**Course Format**

This is an online course. Lectures will be delivered online at the dates/time specified above. Students are required to have a computer with internet access and a webcam.

**Course Learning Outcomes (CLO)**

Upon successful completion of this course, students will be able to:

- CLO1. Demonstrate an understanding of the microprocessor architecture, its instructions and addressing modes
- CLO2. Analyze a microprocessor program and develop an assembly language programs for applications.
- CLO3. Use development tool for exploring microprocessor architecture, software and hardware development.
- CLO4. Analyze experimental data and prepare technical reports and documents.

### Required Texts/Readings

- Laboratory manual, documents, and assignments are available on class Canvas.
- Other Readings:
  - Documents related to Texas Instrument Robotics System Lab Kit Max (TI-RSLK MAX) at <https://www.ti.com/tool/TIRSLK-EVM?keyMatch=TIRSLK-EVM&tisearch=Search-EN-everything&usecase=GPN%23buy>

### Lab Kits

Each student will be provided a Texas Instrument Robotics System Lab Kit Max (TI-RSLK MAX) to learn and demonstrate the microprocessor-based system. The TI-RSLK MAX is an embedded system based on MSP432P401R microcontroller that interfaces with peripherals such as sensors and motors. The MSP432 is a mixed-signal microcontroller family that is based on a 32-bit 48MHz ARM Cortex-M4F with floating-point operation unit. The Development Environment (IDE) for the TI-RSLK MAX is the Code Composer Studio (CCS) provided by Texas Instruments for use with TI microcontrollers and embedded processors.

### Laboratory Exercise Reports

Each laboratory exercise report requires same information and sections as described below and with additional information as described in the lab assignment on Canvas. Each laboratory exercise report must be turned in as scheduled. Students may be asked to demonstrate their lab exercises anytime so please make sure that data and programs are always available. Each student is responsible for individual laboratory exercise reports and late reports will not be accepted.

Each lab report must be prepared neatly and professionally. The technical contents, format, completeness, and appearance of the report all contribute to the report's grade. Students are responsible to include all requested and necessary information in your reports. The report must have sections in order as listed below. Each section must start with the new page.

A cover page with information shown below (a cover page is available on class canvas):

- EE 120 Laboratory Section #, Semester (example: Spring 2020), Date
- Laboratory number and title
- Student full name (Last, first, middle)
- Lab instructor name
- Lab report due date (as shown on the last page of the syllabus)

And the remaining sections are listed as below. Each section must start on the new page. Figures and tables must be labeled separately and clearly.

- Introduction
- Lab procedure and results
- Conclusion

All reports must be submitted on Canvas in .pdf file and source codes (if required) must be in either in .c (for C), .cpp (for C++), or .asm (for assembly). No other file formats are accepted unless directed otherwise.

## Final Evaluation

Laboratory work will be integrated with the lecture one to determine EE 120 course grade. There will be no grade/pass/non-pass nor final examination for laboratory.

## Grading Information

The lab exercises together with the lecture exams, quizzes, homework assignments, etc. make-up EE 120 course grade (as stated in the EE120 lecture syllabus). Lab exercises (lab participations, reports and demos) cover 25% of the course grade. There are 10 lab exercises for the whole semester and each lab will be graded as 100 points. Schedule for lab exercises is shown below.

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## Course Schedule (Tentative)

Week	Date	Topics, Readings, Assignments, Deadlines
1	8/19/2021	No labs
2	8/26/2021	Discussion of laboratory syllabus, lab kits, equipment, safety, rules, laboratory report preparation and report submissions
3	9/2/2021	Instructor lectures lab 1 Students work on lab 1
4	9/9/2021	Students submit lab 1 report. Instructor lectures lab 2 Students work on lab 2
5	9/16/2021	Students submit lab 2 report. Instructor lectures lab 3 Students work on lab 3
6	9/23/2021	Students demo lab 3 and submit lab 3 report. Instructor lectures lab 4 Students work on lab 4
7	9/30/2021	Students demo lab 4 and submit lab 4 report. Instructor lectures lab 5 Students work on lab 5
8	10/7/2021	Students demo lab 5 and submit lab 5 report. Instructor lectures lab 6 Students work on lab 6
9	10/14/2021	Students demo lab 6 and submit lab 6 report. Instructor lectures lab 7 Students work on lab 7
10	10/21/2021	Students demo lab 7 and submit lab 7 report. Instructor lectures lab 8 Students work on lab 8
11	10/28/2021	Students demo lab 8 and submit lab 8 report. Instructor lectures lab 9 Students work on lab 9 (2-week lab)
12	11/4/2021	Students continue to work on lab 9 ( 2-week lab)
13	11/11/2021	Students demo lab 9 and submit lab 9 report. Instructor lectures lab 10 Students work on lab 10 (2-week lab)

Week	Date	Topics, Readings, Assignments, Deadlines
14	11/18/2021	Students continue to work on lab 10 (2-week lab)
15	11/25/2021	Students demo lab 10 and submit lab 10 report

### **Additional Rules for Spring 2021 EE Laboratories**

Check SJSU Health Advisories website for updated information about university requirements and rules  
<https://www.sjsu.edu/healthadvisories/>