

# ME 133 Winter 2022

## Lab Project

March 3, 2022  
Due: 3/17/2022

Submit a zip file named `yourFirstName-LabProject.zip` on Canvas with your code, a lab report (following the format in syllabus), and a short video proving the working hardware-software integration.

### Overview

The purpose of the course project is to apply the tools and concepts learned throughout the quarter. The goal of the project is to design and build a mechatronic system using your Arduino and components from the labs. To begin, formulate your project as a *design question* which you will try to answer (How should an alarm system be designed?). This will keep the project focused and in scope.

### Requirements

**Mechatronic Components:** Your project must incorporate *each* component of a general mechatronic system as shown in Fig. 1.

**Implementation of some type of user input and control:** Your project must incorporate input from a user. This can be in the form of button pressing or a graphical user interface, for example. Your mechatronic system must use the input to modify some type of behavior of the mechatronic system.

**Should have sufficient complexity:** The project must be sufficiently different than the previous labs and have a level of complexity appropriate for a final project. This means don't make something simple. At the same time don't be too ambitious. A good strategy is to start simple, and add complexity in stages.

### Final Report

The final report should consist of a lab report following the same format as previous labs.

- Abstract.** A single paragraph summarizing the paper's content, including a concise introduction of the topic, outline of the major results, and summary of the conclusions.
- Introduction.** This section should provide context for the project and include a summary of related work. Make sure to answer the following: Why is the problem interesting, what question does your project aim to answer, how is it challenging and what related work has been done before?

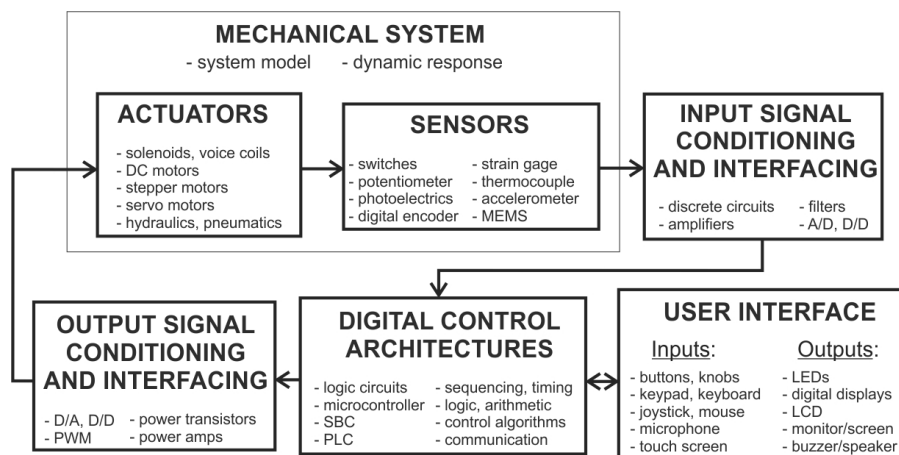


Figure 1: Components of a mechatronic system.

- c. **Methods.** Here you should provide a detailed description of all the techniques used to generate your results. Include a description of the each component of the mechatronic system (see Fig. 1), and descriptions of the algorithms used with appropriate visual aids (e.g., block diagram of the controller).
- d. **Results and Discussion.** Present and discuss the results of your project. Include figures to support your results. Provide context and interpretation.
- e. **Conclusion.** Restate your research question, the methods used, and your major findings. Contextualize your results in terms of what has been previously done.
- f. Please include your code as an appendix or supplemental files.

Your final report will be graded as follows:

1. (15%) Clear and organized presentation
2. (25%) Design and problem description
3. (25%) Solution (methods) description
4. (25%) Results description including supporting materials
5. (10%) Overall difficulty