

# ESC204 | Praxis III

## Prototyping Skills Assignment | Prototype Concept

**Due Date: January 26, 2026**

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This Prototype Concept document outlines which elements of the Design Concept discussed in the Prototyping Skills Assignment (PSA) Design Concept Overview document that groups will be realizing as a prototype system during the assignment.



**NOTE:** In ESC204, we deal with large, open-ended design problems; there is no expectation that the Design Concepts you propose be realized in their entirety within the constraints of this course. Instead, you will think critically about which *elements* of your Design Concept you will realize as a Prototype System. You want to ensure your prototype is able to help you verify one or more key functions of your design concept, or demonstrate how your Design Concept will interact with its environment (or both).

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## 1 Prototype Concept Summary

We have chosen to prototype a single lighting module from the greenhouse lighting subsystem as highlighted in [Figure 1](#). We will focus on exploring the direct user interface where the user uses a button (or multiple buttons) to control the mode of the module. We will **not** be prototyping the network interface and control of the module through the network, or the energy management system.



**PAUSE:** Why have we asked you to prototype these elements of the overall Design Concept as part of the PSA? This selection of Prototype System allows you to practice the key skills you learned during the Prototyping Bootcamp, but it also allows you to demonstrate how your Design Concept will interact with its environment (i.e., a user). What else could you explore about the Design Concept using this choice of Prototype?

We have divided our Prototype System into three subsystems. The first is a **structural subsystem** that consists of a case that houses all the other components, but allows the user to access the button and see the light output. We will be using digital fabrication for this subsystem. The second is the **electrical subsystem** that consists of the components needed to implement the circuits for the user interface and light output as well as run the logic. We will be simulating the system power by connecting the electrical subsystem directly to a power source (i.e., a laptop).

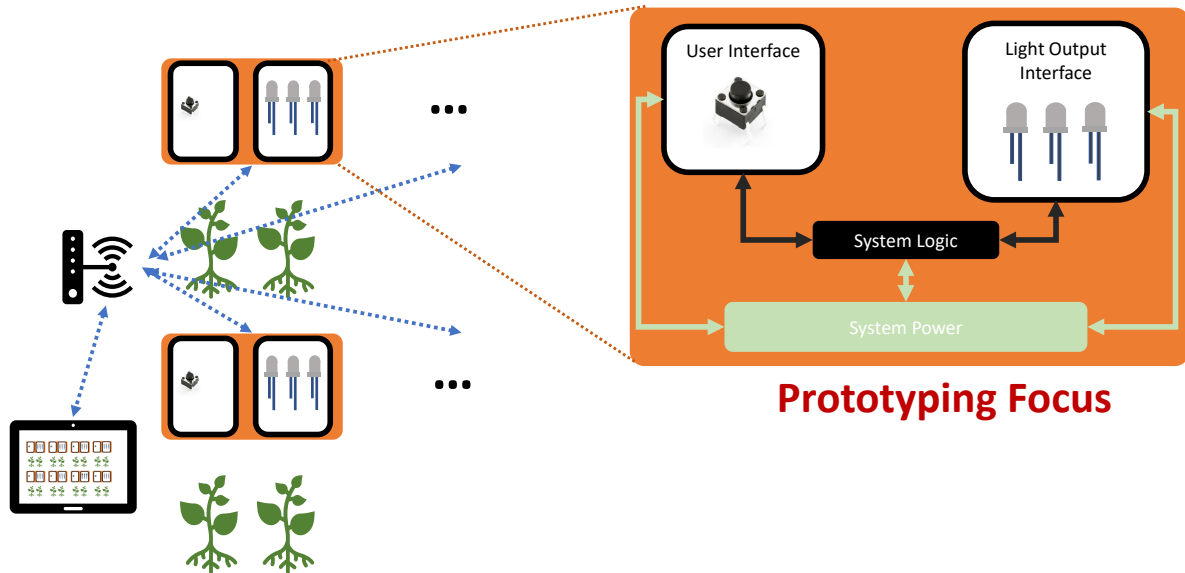


Figure 1: Prototyping path selected based on Design Concept to explore design further.

The third is the **software subsystem** that contains the code that implements the logic. A sketch of the Prototype System architecture is shown in [Figure 2](#).

We have developed a Specification that captures the key features and functions of the Prototype System. The specifications are related to the Objectives identified for the overall Design Concept, but describe in detail the more limited functionality of our prototype system (whose main purpose is to explore direct user control for a single lighting module).

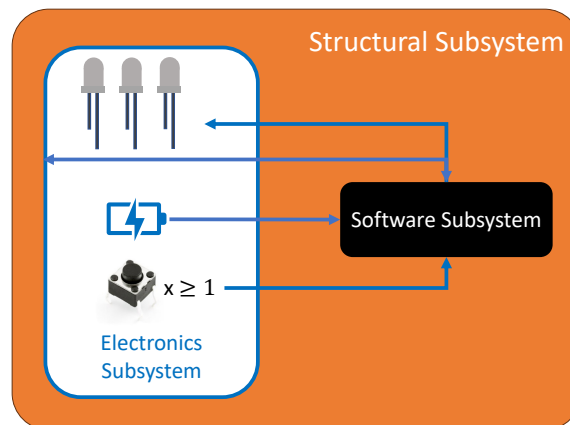



Figure 2: Prototype System Architecture.

## 2 Prototype Concept Development

 **NOTE:** In the more complete Prototype Concept document you will produce for your Major Design Project, you will provide information on the process that led to the particular Prototype Concept you selected. This will include discussion of the different prototyping paths (or options) your team identified and how you converged to the selected Prototype System, providing rationale for decisions made along the way.