

FLORIDA STATE UNIVERSITY

DEPARTMENT OF MECHANICAL ENGINEERING



EML 4551 Senior Design I Milestone 2: Scope of Work

Project Manager:

Aaron Burghardt, ab21ca@fsu.edu

Team Members:

Mandolin Brown, mhb21b@fsu.edu

Jack Smith, jts21@fsu.edu

Matthew Thompson, mdt13d@fsu.edu

Prepared for:

Dr. Yvonne Traynham, P.E., Ph.D.
Teaching Faculty

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Mechanical Engineering Department,
Florida State University Panama City 4750 Collegiate Drive,
Panama City, Florida, 32405

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1 Scope of Work

1.1 Project Description

In general, our team will provide all planning, design, engineering and prototyping services required for the proper design and for all other services necessary for the construction of the project.

The most significant inspiration for this project spawned from the faults of a standard dog door which allows pets to roam in and out of a house without restraint. This causes issues for home owners when pets track dirt, mud, or water into the residence. Subsequent problems can arise from these circumstances such as interior property damage. Another significant fault of conventional dog doors is the lack of security they provide. Small children could potentially fit through the door, and other risks are posed. These conditions motivated the team to envision a feasible way for homeowner's dogs to have limited or controlled access the homeowner's house interior and yard. The product would allow homeowners to remotely set locking constraints on the door based on conditions such as weather, time of day, and other relevant factors.

This is a two phase project. Phase 1 consists primarily of concept selection and design while Phase 2 consists of prototyping and building the product. A more detailed list of tasks and scheduling is available in the Work Break Down Structure (WBS) upon request.

1.2 Phase 1 - Concept Selection and Design

Phase 1 is primarily for research and design of this project with an expected completion date of April 26, 2023. All milestones and deliverables can be referenced. The main goals for this phase are:

- Establish customer needs and wants
- Research similar products currently on the market
- Come up with at least three concepts that closely align with the customers needs and wants
- Review and select one concept
- Further design and breakdown concept to create a Bill of Materials (BoM)
- Purchase all items on the BoM

1.3 Phase 2 - Prototyping and Build

Phase 2 is focused on the prototyping and building of the product. This phase may require slide redesigns or configurations depending the outcome of prototyping with an expected completion date of August 26, 2023. The main goals for this phase are:

- Receive / Verify that ordered parts are in working condition
- Prototype and test assemblies
 - Test and debug electrical assemblies
 - Test physical assemblies
- Final prototype build and test

Goals

- Allow a consumer to remotely enable or disable the door's locking mechanism
- Implement a rain sensor and control unit to provide an autonomous locking function
- Autonomous system will detect an incoming dog and will actuate, opening the door and only able to close if the doorway is clear
- Be able to display an error code in case of obstructions in the locking mechanism and notify the owner
- Be able to be directly wired into any standard U.S. homes electrical infrastructure
- Can plug into an electrical outlet
- The design must be affordable for the competitive market