NEXT GEN
ENGINEERING

PROJECT PLAN

Florida Space Institute Rover Project

Version No.	Description	Active as of:
1	Things in Version: • info	5/10/2022
2		

FSI Mars Rover Project

FSI RASSOR Rover

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I. Acronym List:

CAD = Computer Aided Design
ENG = Engineering
WBS = Work Breakdown Schedule
FSI = Florida Space Institute
NGE = Next Generation Engineering
ROV = Remotely Operated Vehicle
RASSOR = Regolith Advanced Surface Systems Operations Robot
RSO = Registered Student Organizations

Purpose of this Document:

This document serves as a template for project plans. This document contains basic sections that should be filled out prior to the start of any project.

This document should provide any reader, regardless of their role, an understanding of what the goal of the project, who will be involved, what the milestones of the project are, and how information will be shared.

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II. General Project Information

Project Title:	FSI Rover Project

Description:	This project will be the manufacturing, assembly, and showcase of the FSI rover. The rover will be manufactured using the provided Flyingbear Tornado 3D printer and a predetermined list of electronic parts. After the assembly of the rover, the rover will be showcased to local schools and at regular campus events.

Vision:	This project is a way to develop practical skills in a collaborative environment. Through the project we will be able to gain experience determining the most time and resource efficient methods of 3D printing. As well as basic skills in the assembly of a ROV. The overall objective of the project is to inspire the next generation of creative and innovative minds.
Parallel Goals:	In addition to hardware experience, this project will familiarize members with CAD designs and their effectiveness. The project will also provide its members the opportunity to work with UCF RSOs and network with other students.

Milestones	Success Criteria	Dependencies/Risks	Due Dates
Chassis Design	A modular chassis has been designed and is ready for print.	Requires further research.	1/30/2023
3D Print Rover Parts	All rover parts have been printed, cut, and are ready for assembly.		2/1/2023
Assemble Rover Body	Mechanical aspect of rover is complete and operational	Requires 3D printed parts.	2/15/2022
Assemble Rover Electrical Components	Electrical aspect of rover is completed and operational	Requires Assembly of specific body parts.	2/28/2023
Program Rover	Software aspect of rover is completed and operational	Requires functionality of electrical components. All current team members are non-computer science and further research may be required.	4/1/2023

Test and Revaluation	Rover has been tested and evaluated for final report of effectiveness.	Requires completed rover.	5/7/2023
Robotic Arm Design	A modular robotic arm has been designed and is ready for print and testing.	Requires research	3/1/2023
Robotic Arm Assembly and Evaluation	Mechanical, electrical, and software aspect of the Robotic Arm is Assembled and tested for	Requires printed robotic arm and electrical components for the Robotic arm	4/1/2023
All milestones are dependent on the 3D Printers reliability as well as the CAD files and parts list provided by FSI. Dates will change based on complications and delivery dates.			

Project Constraints:	This project is provided by FSI and as such, limits the amount of creativity as well as restricts timetables to FSI's participation

III. Work Breakdown Schedule

1. Fix 3D Printer

1.1. Leveling

1.1.1. Level Bed

1.1.2. Review Auto-level Code

1.2. Review G-Code

1.2.1. Finalize Z-Axis in Code

1.3. Vibrating Supports

1.3.1. Test for critical issue

1.3.2. Fix any critical issues

1.4. Practice Print

1.4.1. Identify Practice Print

2. Printing

2.1. Print Wheels

2.2. Print Body

2.2.1. Prep the Prints

2.2.2. Modify the chassis prints (and make sure that it can be reassembled)

2.2.3. Dependent on CAD files

3. Assembly

3.1. Assemble Electrical and Control System

3.1.1. Test Control System

3.1.2. Assemble Control System

3.1.3. Test Electrical System

3.1.4. Assemble Control System

3.2. Assemble Printed Parts

3.2.1. Dependent on CAD Files and parts list

4. Coding

4.1. Basic Motions

4.1.1. Coding rover to go in basic cardinal directions

4.2. Integrate and Test FSI Control Software

IV. Project Budget by Phase

Parts and materials utilized in the repair of the 3D printer as well as the construction of the rover will be purchased through external sources. All required parts and filament for the construction of the Rover as well as the provided 3D printer will be documented and reimbursed by eli2. Costs will vary.

Item	Cost	Quantity	URL	Notes
	(Range)			

V. Communication Plan

The project will meet weekly in person to work towards the completion of the project. While there will be tasks that can be completed online, most of the project will be in person and hands-on. Additionally, prior to each meeting members will be sent a preview of the agenda and pending tasks before the coming meeting.

Work with eli2's PMs of Outreach, to present the rover to local Highschool students and RSOs to educate them about engineering and the project.