UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE *of* ENGINEERING

UNC Charlotte – Lee College of Engineering Senior Design Program
Company Information

Company Name	*ETCM*	**Date Submitted**	*04/12/2019*
Project Title	*NASA Lunabotics Engineering Competition* **LUNA_COMP1**	**Planned Starting Semester**	*Fall 2019*

Funding:

What is the source of funds that will be used to cover all of the direct costs of this project?
Self, Grant, Department??_____Grant_____

Is this source of funds already secured? Yes _____ No ___x____

Technical Contact(s)*

	Technical Contact 1	**Technical Contact 2**	**Technical Contact 3**
Name	Aidan Browne		
Phone Number	704-687-5033		
Email Address	aidanbrowne@uncc.edu		

*We would like to have more than one technical contact, so there is a back-up in case of travel, sickness, job re-assignment, etc.

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills:

Discipline	**Number**	**Discipline**	**Number**
Mechanical	2	Electrical	2
Computer	1	Systems	1
Other ( )			

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Project Overview and Requirements:

NASA's Lunabotics Engineering Competition is a robust university-level competition that challenges student teams to design and build autonomous excavation robots capable of traversing a lunar surface and digging and depositing lunar regolith. When mined effectively, this regolith can be a valuable resource for building lunar habitats and producing water, breathing air, and propellants essential for future long-duration lunar missions. Lunabotics has four main aspects:

1. Mining: Teams compete with their rovers in a simulated lunar environment at Kennedy Space Center. Lunabotics rovers compete using BP-1 simulant because it is the most mechanically similar substance to lunar regolith – from roving to digging to mitigating dust. Lunabotics strongly encourages teams to perform these actions autonomously.
2. Presentation and Demonstration: Lunabotics teams must effectively demonstrate their robot's functionality and communicate their design process, performance goals, safety plan, and design innovations to a panel of NASA & Commercial subject matter experts (SMEs).
3. Systems Engineering: All teams are required to submit a thorough systems engineering paper to compete. The paper is judged on topics such as project management, design philosophy, CONOPS, schedule, system hierarchy, requirements, technical and cost budgets, trade studies and conducting major reviews like SRR, PDR and CDR. (This is in place of a similar Senior Design required document).
4. Outreach: Outreach is an important and required component of Lunabotics. Teams inspire others to learn about robotics and have engaged an audience of over 1-million in the past 10 years!

Expected Deliverables/Results:

Deliverables include:

- *System Engineering Paper*
- *Proof of Life Video*
- *Parts list*
- *Travel to competition at Kennedy Space Center May 18-22, 2020.*

List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):

- Robotics
- Control systems
- Programming
- CAD
- Machining