UNC Charlotte – Lee College of Engineering Senior Design Program
<u>Company Information</u>

Company Name	*UNCC COE*	**Date Submitted**	*03/07/2019*
Project Title	*NASA Student Launch* **USLI_COMP5**	**Planned Starting Semester**	*Fall 2019*

<u>Funding:</u>

What is the source of funds that will be used to cover all of the direct costs of this project?
<u>Self (Fundraising), Grant (NC Space Grant), _____</u>

Is this source of funds already secured?   Yes ___x__(partially)__   No _____

<u>Technical Contact(s)*</u>

	Technical Contact 1	**Technical Contact 2**	**Technical Contact 3**
Name	Jerry Dahlberg		
Phone Number	704-687-1394		
Email Address	Jdahlbe2@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.

<u>Personnel</u>

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	9	Electrical	2
Computer	1	Systems	1
Other ( )			

<u>Project Overview and Requirements:</u>

As described by the NASA SLI handbook, "The NASA University Student Launch Initiative

(USLI) involves students in designing, building, and testing reusable rockets with associated scientific payloads. This unique hands-on experience allows students to demonstrate proof-of concept for their designs and gives previously abstract concepts tangibility. (SLI Handbook) The project also requires community outreach throughout the project as well preparing written documentation and oral presentations to NASA engineers and staff.

This project requires the design and construction of a re-useable dual deployment rocket capable of carrying a designated payload to a designated altitude. The payload(s) will have a scientific value relevant to NASA's mission, which may include performing a task and taking measurements. Several half scale launches and a minimum of two full scale launches will be conducted prior to competition in April, which is held in Huntsville Al. The team will be separated into two sub groups: Payload Team and Launch Vehicle Team. The team deliverables are scheduled based on the NASA design timeline which will require the team members to typically work on the project >30 hrs per week, to include fall, winter and spring breaks.

STUDENT REQUIREMENTS:
All students on the team are required to participate in on and off campus outreach and fundraising events as required by the competition. All team members must be available to conduct flight testing on weekends and over school breaks as well as travel to competition in April. All team members will be required to take the Motorsports Shop safety test to access the team work area.

Expected Deliverables/Results:

Deliverables include:
1. All senior design course deliverables
2. All competition deliverables as specified by NASA
3. System Block Diagram
4. System Math Model, including stress analysis and dynamic performance
5. Payload concept ideation sketches
6. System detailed drawings
7. System assembly drawings and procedure
8. System transport configuration drawings
9. System / subsystem testing plan
10. Financial plan
11. Outreach plan
12. System preflight procedure and checklist
13. System launch procedure and checklist
14. Flyable Hardware (subscale and full scale launch vehicle and payloads)
15. Transition Plan for knowledge retention for Tier 2 competition.

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

Student should have an interest in one or more of the following:
Fluids, Compressible Flow, Instrumentation and Controls, Wireless Communication, Circuit Design, Dynamic Systems, Flight Dynamics, Carbon Fiber Construction, Rocketry Design and

Construction,

Knowledge of the following software:
CAD - Pro/e and/or Solidworks
Matlab , Mathcad
Labview
C programming (for microcontrollers)
Java programming (for GUI)
Microsoft Project
Microsoft Word
Latex
RockSim