

## UNC Charlotte College of Engineering Senior Design Program Process for Supporting an ME, EE, Computer E, SE and CE Project

Thank you for your interest in participating in the UNC Charlotte College of Engineering Senior design program. The program's goal is to match our students with local companies to work together and solve design problems. In this capacity, our students gain real world engineering experience while local companies benefit from completed work on elective research projects. The ideal project should not be on a critical path for the company, nor pertain to trade secrets or corporate sensitive information. While the results of the projects cannot be guaranteed, there are a number of checks and balances put into place to monitor the team's progress and keep the industry supporter updated and abreast of any changes. The senior design teams typically consist of 3-6 students and we estimate about 250 hours of work output per student over the two semester course. There are two options available for staffing projects: 1) A single team producing one solution and one prototype, requiring a donation of \$7,000, 2) Two teams generating two separate solutions and prototypes for the same project idea, requiring a donation of \$10,000. Payment for either option will be invoiced in **February 2017**. Student teams will have a budget of up to \$3,000 for parts and services for their prototype. Expenses in excess of this will be discussed with the supporter.

The documentation required from each participating industry supporter and the associated deadlines are listed below. The senior design course coordinator would be happy to assist with defining the scope of the project so that it fits within the academic schedule if needed.

1. Submit a short description of the intended project with expected deliverables/results. (Project Description form)
2. Provide the contact information for the technical and the financial representatives.

Project work starts in September with the Senior Design Kickoff Breakfast on January 15<sup>th</sup> where the teams will start to discuss the project requirements with their supporters.

Additional milestones are as follows:

- Students submit work breakdown structures, schedules, risk assessments, budgets, change requests, design documentation and reports to their supporter throughout the two semesters.
- The supporter attends design reviews in both semesters to evaluate progress/test results.
- Students present their completed design work at the Design Expo at the end of the first semester (May 4<sup>th</sup>, 2017).
- The second semester is the implementation phase, where students implement their design into a prototype or model and test.
- Students generate appropriate hardware and documentation.
- Completed prototypes and models are displayed at our EXPO on December 8<sup>th</sup>, 2017.

Yes, we are interested in participating in the UNC Charlotte College of Engineering Senior Design Program!



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## **UNC Charlotte College of Engineering Senior Design Program Company Profile 2016-2017 School Year**

**Company Name:** Stabilus  
**Project Title:** Sales Demo/Display to Demonstrate Improved Performance of Gas Filled Damper

### **Technical Contact(s)**

**Name:** Justin Engle/Mike Sayers/Nate Sprik  
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### **Financial Contact**

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## Senior Design Project Description for SPRING 2017

### Project Title: Sales Demo/Display to Demonstrate Improved Performance of Gas Filled Damper (STA-DAMPER)

Supporter: Stabilus

Supporter Technical Representative: ASSIGNED

Faculty Mentor: \_\_\_\_\_ ASSIGNED  TBD (check one)

Single Team  Dual Team \_\_\_\_\_ (check one)

Personnel (EN/ET): \_\_\_\_\_ E, \_\_\_\_\_ Cp, \_\_\_\_\_ Cv, 5 M, \_\_\_\_\_ SE

(Complete if the number of students required is known)

Expected person-hours: (250 per student)

#### Description of Project:

Stabilus requires a portable sales demo/display to demonstrate improved performance of Gas filled Damper versus traditional mechanical spring to add tension to idle pulley. The benefit of the Gas Filled Damper are in addition to adding torsion to the idle pulley it adds damping and reduces the vibration in the system resulting in longer belt life and better performance. The demo will be based on the ZTR mower deck shown below.



#### Initial Project Requirements

##### Functional Display

- Design is for the ZTR deck
- Variable speed – can be changed by user
- 110 V motor (electric)
- Can be powered off standard outlet
- Multiple pulley system to show vibrations
- Similar belt geometry between comparison
- Visual output comparing vibrations
- Safety cover
- Standard parts, can be interchanged if breaks (include BOM with PN and order locations)
- RPM range TBD (1500 RPM?) some testing needs to be completed to ensure vibration “slap” is created
- Transportable – Can be set-up/picked up with 2 people or less



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- Robust stable and safe
- Size max 3x4 feet
- E-stop
- Brake (might be needed)

Case / Transport / Display Base

- Crate/Transport container works as part of display – ie table or base
- Crate can be moved with forklift –Good for robust transport
- Lockable, Secured, and re-usable
- Can protect display and prevent transit damage

Ideally the functional model completed for use at GIE show Oct 15, 2017

**Expected Deliverables/Results:**

Completely functional model shall be provided.

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

None