September 25, 2015

**Senior Project Opportunity – Scaled Fuselage Test Article**

**Background**

Undergraduate strength laboratories usually must focus on simple, representative tests to demonstrate engineering principles. Tests of actual structures can be much more challenging but can yield invaluable insight into industry needs & capabilities.

**Objective**

This Senior Project will unleash interested & driven undergraduates towards designing & building a scaled section of aircraft fuselage, thoroughly analyzing its capability to carry tension, bending and shear, then developing test procedures & fixtures so that the test article can be tested in the Aerodynamics Structures Lab, and then testing the article and reporting on results.

**Deliverables**

This project is intended for a two-quarter duration with the following basic actions & deliverables.

- Research current aircraft fuselage designs and test methods.
- Design & build a scaled section of aircraft fuselage (around 3’ to 6’ diameter).
- Perform preliminary analysis to confirm sizing and rough test loads and needs.
- Design and build a test fixture to mount test article to Aero Structures Lab Strongback.
- Design and build a transport dolly to move and store test article.
- Thoroughly analyze test article & fixture to determine and document recommended test loads to enable repeated testing & to identify “redline” loads so structure is not damaged during testing.
- Analyze structure thoroughly to test loads chosen.
- Fully instrument article with strain gages, deflection measurement devices, and the like.
- Test article and document results.
- Record results with video, film, or other means.
- Prepare either a final report, or write a paper for submittal to ASME, AIAA, or other journal or conference.
- Prepare & present a powerpoint on the entire process and project and present to Dr Coburn & other interested faculty.
- Cost of test article, test equipment not currently owned by department, and other expenses are the students sole responsibility, although funding can certainly be solicited and utilized pert student discretion & ability.

**Eligibility**

Participating students must have the following qualifications, experience, and characteristics.

- Passion for learning coupled with initiative & drive to figure things out on their own.
- Tenacity that is not deterred by obstacles.
- Junior or Senior Status plus completion of all required 300-level courses in your discipling.
- Majoring in any Engineering Discipline, but non-Aero Majors also need note or E-mail from Department Chair authorizing their participation.
- This project is intended for a team of 5-10 students.

**Participation and/or Questions**

Eligible students with interest or questions should contact the undersigned.

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