

MAE 434W/435
Senior Design Project Fall 2014 - Spring 2015

Title:

Design and Testing of a Small Scale Smart-Material Based Solid-State Aircraft

Description:

This is a multi-disciplinary project based on the design, analysis and testing of a small solid-state ornithopter that uses only smart materials to achieve flight. Electrical (EE), Mechanical (ME) and Aerospace Engineering (AE) students will work together in a multi-department senior design team. The students will design, fabricate and test several different iterations of the smart material based composite aircraft as well as power/sensing electronics and control algorithms. No aircraft design background required; however the students should be comfortable with design and analysis software (MatLab, Mathematica, Ansys, Solid Works, AutoCAD or other CAD packages, LabView, XFOIL and AVL etc.), simple analog and digital electronics (resistors, capacitors, op-amps, microcontrollers, simple wiring, etc.), fabrication techniques (bonding, vacuum bagging, manual fabrication, etc.). Most importantly, the team members are expected to have an exceptional work ethic and dedication to the project. Students having a high course load in their senior year should consult the project advisor before applying.

Similar working models can be seen at the YouTube link below:

[<http://www.youtube.com/watch?v=KxTJBp53nO0>]

Please contact the project supervisor to arrange a tour of the Smart Systems Laboratory and to see existing prototypes from the previous team.

[<http://odu.edu/mae/research/ssl>]

In Collaboration with:

ECE Department

Number of students needed:

4 – 6 from each department

Suggested by (Faculty):

Dr. Bilgen

Supervised by (Faculty):

Dr. Bilgen