

## Interdisciplinary Honors Seminar in Scientific Inquiry: IDH 2931, 2008

**Course Title:** Aerospace, Mechanical and Materials Engineering

**Instructors:** Robert Love ([rdlove@ufl.edu](mailto:rdlove@ufl.edu)) and Venkat Jayaraman ([venkatj@ufl.edu](mailto:venkatj@ufl.edu))

**Course Website:** <http://ornithopters.wordpress.com/teaching/>

**Basic Format:** 30 minute discussion led by 2-3 students on topics presented either in the paper assigned or extending the last lecture's main topics to an area of interest  
 30 minute powerpoint presentation by grad students  
 30 minute discussion facilitated by grad students on the topics just presented or some hands on activity from what was discussed in presentation  
 Assignments, assigned technical papers, discussion leader assignments and powerpoint slides will be posted on the website.

**Grading:** All students who complete their assignment for each class as described on the website and come prepared to discuss the topics in class will receive an "A".

**Schedule:** Class held from 6:15-7:45pm, Tue/Thurs each week, 11 seminars, 1 ½ hrs each

June 19 A1	<b>Course Introduction</b> -Syllabus -What do you want from this course? -Website-don't just be a consumer! -Video: Name and 30 second "elevator speech": Who am I? Who am I going to be?	July 10 A6	<b>Why things break (and how we try to make sure they don't!)</b> -Statics -Mechanics of Materials/Failure Analysis -Finite Element Analysis
June 24 A2	<b>Life Long Learning/Research</b> -Styles of learning(about yourself) -Techniques to learn -Ways to find information (online, in print, from others) -Conducting research and writing papers	July 15 A7	<b>Robotics/Machine Vision</b> -Scope of robotics -Industries -Mechanisms -Building a robot: hardware, controller, software
June 26 A3	<b>How things are designed and how things move</b> -CAD Modeling, Visualization -Mechanisms -Dynamics	July 17 A8	<b>Aircraft Design/ Spacecraft Design</b> -How airplanes fly -Types of aircraft and features to note - Propulsion -Types of spacecraft and features to note
July 1 A4	<b>How to control how things move</b> -Concepts of Controllability/Observability -PID control -Theory vs. Hardware	July 22 A9	<b>Programming</b> -Scope of computer programming -Types of Software -Intro to Matlab and C++ -Fundamentals of programming
July 3	<b>(Off)</b>	July 24 A10	<b>Dealing with complexity</b> -Computational algorithms -Numerical methods -Design and Optimization
July 8 A5	<b>Material selection, Production Methods</b> -Metals -Ceramics -Polymers -Composites	July 29	<b>Globalization, Teamwork, and Communication Skills</b>