**Class Schedule - Spring 2012**

**Aerospace Engineering**

**AE 598  Special Topics  credit: 1 TO 4 hours.**

Subject offerings of new and developing areas of knowledge in aerospace engineering intended to augment existing formal courses. Topics and prerequisites vary for each section. See Class Schedule or departmental course information for both. May be repeated in the same or separate terms if topics vary to a maximum of 12 hours.

<table>
<thead>
<tr>
<th>CRN</th>
<th>Type</th>
<th>Section</th>
<th>Time</th>
<th>Days</th>
<th>Location</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>56934</td>
<td>Lecture-Discussion</td>
<td>AS2</td>
<td>10:00 AM - 11:50 AM</td>
<td>TR</td>
<td>ARR - Talbot Laboratory</td>
<td>D'Urso, S</td>
</tr>
<tr>
<td>56785</td>
<td>Lecture-Discussion</td>
<td>DSC</td>
<td>03:30 PM - 05:20 PM</td>
<td>TR</td>
<td>225A - Talbot Laboratory</td>
<td>Chung, S Langbort, C</td>
</tr>
<tr>
<td>57625</td>
<td>Lecture-Discussion</td>
<td>HYP</td>
<td>02:00 PM - 03:50 PM</td>
<td>MW</td>
<td>225A - Talbot Laboratory</td>
<td>Austin, J</td>
</tr>
<tr>
<td>58067</td>
<td>Online</td>
<td>MFD</td>
<td>04:00 PM - 05:15 PM</td>
<td>TR</td>
<td>-</td>
<td>Loth, E</td>
</tr>
<tr>
<td>57740</td>
<td>Lecture-Discussion</td>
<td>MMM</td>
<td>09:30 AM - 10:50 AM</td>
<td>TR</td>
<td>104 - Talbot Laboratory</td>
<td>Chew, H</td>
</tr>
</tbody>
</table>

Credit Hours: 4 hours

Aerospace Systems Engr II

Topic: Aerospace Systems Engineering II. This course addresses the fundamental aerospace industry methods for control of an engineering development effort of a complex aerospace system typical in development of spacecraft, launch vehicles, aircraft, remotely controlled vehicles, and associated supporting infrastructure systems in the current acquisition environments. Standards and techniques to control risk, integration of technologies, and exploration of 'design-to' process tailoring and systematically make design decisions. The student will be exposed to the accepted documentation standards and verification practices for the System Engineering. Class will be held in 302E Talbot Lab.

Credit Hours: 4 hours

Distributed Decision

4 hours. Topic: Distributed Decision. Studying recent literature on mathematical theory of multi-agent decision in the presence of limited information.

Credit Hours: 4 hours

Hypersonic Flows

3 or 4 hours. Topic: Hypersonic Flows. Fundamentals of fluid mechanics at hypervelocity conditions: thermochemical (real gas) effects, physical gas dynamics, inviscid hypersonic flows, small-disturbance theory, blunt body flows, shock-shock interaction, hypersonic boundary layers, shock-boundary layer interactions, experiments.

Credit Hours: 4 hours

Multiphase Fluid Dynamics

3 hours. Topic: Multiphase Fluid Dynamics. This course will discuss fluid dynamic and contact interactions for dispersed flow of bubbles, drops and solid particles. The first half topics will discuss particle size distribution, shape and deformation effects, particle dynamics, and turbulent dispersion. The second half will focus on turbulent bias, Brownian diffusion, coupling regimes, particle forces (drag, lift, collisions with other particles and with wall). Pre-requisite: A graduate-level course in fluid dynamics or consent of instructor.

Credit Hours: 4 hours

Multi-scale Modeling of Materi

Topic: Multi-scale modeling of materials. The rapid advancement of computational capabilities has led to the discovery of new fundamental mechanics principles at the nanoscale, which are guiding the use of nanotechnology and nanomaterials in next generation aerospace applications. This course will introduce the theoretical foundation of multi-scale modeling methods, and will provide students with hands-on modeling and simulation experience at the quantum-mechanical, molecular, and the continuum
scales. Particular emphasis will be placed on newly developed bridging techniques, such as inverse solution approaches, to interpret material phenomena across the different size-scales.