Items Returned from Faculty Senate

November 2009

AERO 609. Sustainability Metrics and Life Cycle Assessment in Engineering. (3-0). Credit 3. Concepts of sustainability with associated metrics; application of systems engineering tools to facilitate assessment of viable options on products and processes; assessment of impact on the entire biosphere; product life cycle analysis. Prerequisite(s): Graduate classification.
Texas A&M University

Departmental Request for a New Course
Undergraduate • Graduate • Professional

• Submit original form and attach a course syllabus.

1. This request is submitted by the Department of __Aerospace Engineering__

2. Course prefix, number and complete title of course: __AERO 609 Sustainability Metrics and Life Cycle Assessment in Engineering__

3. Catalog course description (not to exceed 50 words): Concepts of sustainability with associated metrics; application of systems engineering tools to facilitate assessment of viable options on products and processes; assessment of impact on the entire biosphere; product life cycle analysis.

4. Prerequisite(s): __Graduate classification__

5. Is this a variable credit course?  □ Yes  □ No  If yes, from _____ to _____

6. Is this a repeatable course?  □ Yes  □ No  If yes, this course may be taken ______ times.

7. Will this course be repeated within the same semester?  □ Yes  □ No

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

   MS, MEng, PhD in aerospace engineering or related fields

9. Prefix  Course #  Title (excluding punctuation)

<table>
<thead>
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<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>CIP and Fund Code</th>
<th>Admin. Unit</th>
<th>Acad. Year</th>
<th>FICE Code</th>
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</tbody>
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Approval recommended by:

Dimitris C. Lagoudas (or Rodney D. Bowersox) AE

Department Head - Type Name & Sign  Date  Chair, College Review Committee  Date

Department Head - Type Name & Sign
(if cross-listed course)  Date  Dean of College  Date

Submitted to Coordinating Board by:

Associate Director, Curricular Services  Date  Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 3/09
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. This request is submitted by the Department of Aerospace Engineering

2. Course prefix, number and complete title of course: AERO 609 Sustainability Metrics and Life Cycle Assessment

3. Catalog course description (not to exceed 30 words): Concepts of sustainability with associated metrics; application of systems engineering tools to facilitate assessment of viable options on products and processes; assessment of impact on the entire biosphere; product life cycle analysis.

4. Prerequisite(s): Graduate classification

5. Is this a variable credit course? □ Yes □ No If yes, from _____ to _____

6. Is this a repeatable course? □ Yes □ No If yes, this course may be taken _____ times. Will this course be repeated within the same semester? □ Yes □ No

7. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography) MS, MEng, PhD in aerospace engineering or related fields

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix: AERO 609 Title (excluding punctuation): Sustainability Metrics

   Lecture Lab SCH CIP and Fund Code Admin. Unit Acad. Year HICE Code
   0 0 0 0 1 4 2 7 0 1 0 0 6 0 1 0 0 1 0 - 1 1 0 0 3 6 3 2

Approval recommended by: [Signature]

Dimitris C. Lagoudas (or Rodney P. Bowerson) AF
Department Head - Type Name & Sign Date
Chair, College Review Committee Date

Department Head - Type Name & Sign (if cross-listed course)
Date

Submitted to Coordinating Board by:

Associate Director, Curricular Services Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu
Curricular Services – 3/09

Effective Date 3 of 6 F
AEROSPACE ENGINEERING

Course title and number: AERO 609 – Sustainability Metrics and Life Cycle Assessment in Engineering
Term: Fall 2011
Credit/Hours: 3.0
Meeting times/location: TBA

Course Description and Prerequisites
Concepts of sustainability with associated metrics and how they are applied of systems engineering tools to facilitate assessment of viable options regarding products and processes with respect to their impact on the entire biosphere and life cycle analysis of a given product.
Prerequisite: Graduate Classification.

Learning Outcomes or Course Objectives
Students will gain understanding of the complexities in sustainability and appreciate the need to take a systems approach. They will learn how to quantify sustainability of products and processes and use that knowledge to make assessment of the entire life cycle from “cradle to grave”. Students will utilize the assessment methodology to design more sustainable products and processes.

Instructor Information
Name: Dr. Ramesh Talreja
Telephone number: 979.458.3256
Email address: Talreja@aero.tamu.edu
Office hours: TBA
Office location: HRBB 736A

Textbook and/or Resource Material
3. Handout notes and copies of selected articles.

Grading Policies
Midterm project report: 30 percent
Final project report and presentation: 70 percent
A 90 – 100%
Course Topics

<table>
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<th>Week</th>
<th>Topic</th>
<th>Hours</th>
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<tr>
<td>1</td>
<td>Sustainability – definitions, basic concepts and principles, interrelationships between technology, economics, environment and society</td>
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<tr>
<td>2</td>
<td>The biosphere, human impacts, complex systems, synergies</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Energy, exergy, thermodynamics as foundation for sustainability metrics</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Products, processes and embodied energy</td>
<td>3</td>
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<tr>
<td>5</td>
<td>Life cycle analysis and its implications for sustainability</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>Case study 1: A mechanical engineering product</td>
<td>6</td>
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<tr>
<td>7</td>
<td>Case study 2: A chemical engineering process</td>
<td>6</td>
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<tr>
<td>8</td>
<td>Case study 3: A transportation system</td>
<td>6</td>
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Other Pertinent Course Information

Students are expected to attend class. For additional information visit the student rules website on attendance: [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07).

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit [http://disability.tamu.edu](http://disability.tamu.edu).

Academic Integrity

For additional information please visit: [http://www.tamu.edu/aggiehonor](http://www.tamu.edu/aggiehonor)

"An Aggie does not lie, cheat, or steal, or tolerate those who do."
February 4, 2010

TO: University Graduate Curriculum Committee

FROM: Dr. Forster Ndubisi, Head
Department of Landscape Architecture & Urban Planning

Dr. Glen Mills, Head
Department of Architecture

RE: Proposed new course AERO 609

To those concerned, the issue of the title for the proposed graduate AERO 609 has been resolved by the alteration of the title to be: “Sustainability Metrics and Life Cycle Assessment in Engineering”. This change satisfies the concerns we had about the course. Professor Talreja is to be congratulated for his focus on sustainability metrics.