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 ________________________

2. Course prefix, number and complete title of course: MEEN 614 Design and Modeling of Viscoelastic Structures

3. Course description (not to exceed 50 words): To provide the mechanical and mathematical basis for modeling linear viscoelastic materials.

4. Prerequisite(s): Mechanics of Materials (CVEN or equivalent)

Cross-listed with:

Cross-listed courses require the signature of both department heads.

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. Has this course been taught as a 489/689? ☑ Yes ☐ No If yes, how many times? 3

Indicate the number of students enrolled for each academic period it was taught. Fall 2007:12, Spring 2007:23,Fall 2008: not open yet

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 or PhD in MEEN

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

10. | Prefix | Course # | Title (excluding punctuation) |
    | ------ | ----------------------------- |
    | MEEN  | 6 1 4 VISCOELASTIC STRUCTURES |

<table>
<thead>
<tr>
<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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Approval recommended by:

Head of Department Date

Chair, College Review Committee Date

Head of Department (if cross-listed course) Date

Dean of College Date

Submitted to Coordinating Board by:

Dean of College Date

Associate Director, Curricular Services Date Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201.
Curricular Services – 11/07
Course title and number  Design and Modeling of Viscoelastic Structures (MEEN 614)
Term (e.g., Fall 200X)  Fall 2009
Meeting times and location  TBA

Course Description and Prerequisites
Mechanical and mathematical basis for modeling linear viscoelastic materials, characterization of viscoelastic material properties from experimental tests, application of stress and deformation relationships for viscoelastic structural members subjected to axial, torsional, and bending loads.

Prerequisite: Mechanics of Materials (CVEN 305, or equivalent)

Learning Outcomes or Course Objectives
To provide the mechanical and mathematical basis for modeling linear viscoelastic materials and designing structural components made of viscoelastic materials.

Instructor Information
Name  Anastasia Hanifah Muliana
Telephone number  979-458-3579
Email address  amuliana@neo.tamu.edu
Office hours  TBA
Office location  ENPH 226

Textbook and/or Resource Material

Grading Policies
HW 25%, Mid-term I 25%, Mid-term II 25%, and Final project 25%
A ≥ 90; 80 ≤ B < 90; 70 ≤ C < 80; 60 ≤ D < 70; F ≤ 60

Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
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<tr>
<td>1-3</td>
<td>Fundamental viscoelastic phenomena: to introduce several responses of viscoelastic materials, i.e., creep, relaxation, and their relations.</td>
<td>Chapter 1-3</td>
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<td>4-6</td>
<td>Constitutive model of linear viscoelastic materials (One Dimensional Model): to use differential equations, hereditary integrals, and correspondence principle. Note: Laplace transform, convolution integral, Volterra integral will be covered</td>
<td>Chapter 2-5</td>
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<tr>
<td>7-8</td>
<td>Sinusoidal loading on linear viscoelastic</td>
<td>Chapter 6</td>
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materials: to determine stress-strain histories under sinusoidal loadings.

9 Measurement of viscoelastic behavior: to learn how to characterize viscoelastic material properties from the experimental tests (creep, relaxation, and dynamic mechanical measurements).

10-12 Design of Viscoelastic Structures: to determine stress and deformation relationships for viscoelastic structural members subjected to axial, torsional, and bending loads.

13 Temperature effects on viscoelastic material behaviors.

14-15 Constitutive model for three dimensional responses of linear isotropic viscoelastic materials: to determine shear and bulk (volumetric) mechanical properties of viscoelastic materials, and understand stress and strain histories.

Lakes (1998)

Chapter 8-9

Chapter 11

Chapter 7

Other Pertinent Course Information

Mid-term I: TBA
Mid-term II: TBA
Final project is due on final exam time.

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

Academic Integrity

For additional information please visit: http://www.tamu.edu/aggiehonor

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