Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional

Submit original form and 25 copies. Attach a course syllabus to each.*

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

2. Course prefix, number and complete title MEEN 661 Principles of Composite Materials

3. Course description (not more than 50 words) Classification and characteristics of composite materials; micromechanical and macromechanical behavior of composite laminae; macromechanical behavior of laminates using classical laminate theory; interlaminar stresses and failure modes; structural design concepts, testing and manufacturing techniques.

4. Prerequisite(s) MEMA601 or MEMA602/ MEEN603 or MEEN608 Cross-listed with MEMA 613 Cross-listed courses require the signatures 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 the course be repeated within the same semester/term? □ Yes □ No

7. Has this course been taught as a 489/689? □ Yes □ No If yes, how many times? ______ Indicate the number of students enrolled for each academic period it was taught. 7

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)

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 (exclude punctuation) |
      MEEN 661 | PRINC OF COMPOSITE MTL |

      Lect. | Lab | SCH | Subject Matter Content Code | Admin. Unit | Acad. Year | FICE Code |
      03 00 03 14 1 9 0 1 0 0 0 6 1 9 2 0 0 8 | 0 9 0 1 0 3 6 6 |

      Do not complete shaded area.

Approval recommended by:

Head of Department 11/7/2007

Chair, College Review Committee 11-26-07

Dean of College 11-26-07

Submitted to Coordinating Board by:

Dean of College Date

Director of Academic Support Services Date

Effective Date

* Attach a syllabus according to the guidelines on the Internet site www.tamu.edu/admissions/oaras. To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.

OARAS-10/99

1 of 3 B26
MEEN 661: Principles of Composite Materials

Objectives: To provide fundamental knowledge on mechanical properties of composite materials, experimental tests for determining effective mechanical properties, mathematical formulation for predicting overall composite's behaviors, and micromechanical models for analyzing elastic properties of composites. Focus will be on fiber reinforced composites.

Prerequisite: None

Instructor: Anastasia Mullana  
Office: Engineering Physics Building (ENPH), Room 224  
e-mail: amuliana@neo.tamu.edu

Lecture: TBA

Grading: 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


Other relevant books are listed below:  

Topic list (14 week semester):  

Week 1-2: Introduction to composites: fibers, particles, and matrix materials; effective mechanical behaviors; manufacturing methods; and structural applications. A brief introduction to nanocomposites will be included.


Week 4-5: Constitutive model of fiber-reinforced lamina: lamina engineering constants, plane-stress constitutive equations, coordinate transformations, hygro-thermal effects.

Week 6-9: Lamination theory: effective in-plane forces and bending moment, constitutive model for laminate, special laminates, laminate's engineering constants, through-thickness properties, and hygrothermal laminate analyses.

Week 10: Measurement of physical and mechanical properties: characterization of physical and mechanical properties from experimental tests.

Week 11: Interlaminar stress distributions.

Week 12-13: Laminate structural analyses: bending of laminated plates; axial-torsional-pressure coupling in laminated tubes; and transverse shear effects.

Week 14: Micromechanical modeling approach: rule of mixture, volume averaging, Voigt and Reuss bounds, and Hill's concentration factors.
Academic Integrity Statement:
Aggie Honor code: "An Aggie does not lie, cheat, or steal, or tolerate those who do."

It is the responsibility of students and instructors to help maintain scholastic integrity at the university by refusing to participate in or tolerate scholastic dishonesty (Student Rule 20. Scholastic Dishonesty, [http://student-rules.tamu.edu]). New procedures and policies have been adopted effective 1 September 2004. Details are available through the Office of the Aggie Honor System ([http://www.tamu.edu/aggiehonor/]). An excerpt from the Philosophy and Rationale section states: "Apathy or acquiescence in the presence of academic dishonesty is not a neutral act. Failure to confront and deter it will reinforce, perpetuate, and enlarge the scope of such misconduct. Academic dishonesty is the most corrosive force in the academic life of a university."

Accordingly, instances of scholastic dishonesty by students in this class will be investigated and pursued fully in accordance with the guidelines of the current edition of the Texas A&M University Student Rules ([http://student-rules.tamu.edu]). Dismissal of the student from Texas A&M University can be the final result of such an investigation.

Americans with Disabilities Act (ADA) Policy Statement:
The Americans with Disabilities Act is a federal antidiscrimination 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 the Department of Student Life, Services for Students with Disabilities in room 126 of the Koldus Building, or call 845-1637.