College of Engineering
Multidisciplinary Certificate in Mechanical Properties of Materials

Graduate students conducting research within the Mechanical Properties Research Laboratory (MPRL) are strongly encouraged to pursue the multidisciplinary certificate in Mechanical Properties of Materials, administered through the College of Engineering. This certificate is awarded along with the graduate degree, and denotes a specialty in mechanical properties and affiliation with the MPRL that may be useful in seeking future employment opportunities in addition to providing a well-balanced educational program.

Description: A multidisciplinary certificate program consisting of 12 semester units in which graduate students from participating Schools in the College of Engineering may participate to obtain an in-depth understanding of mechanical behavior and properties. The program is entitled "A Certificate in Mechanical Properties of Materials" and is administered through the Mechanical Properties Research Laboratory (MPRL) to graduate students in participating Schools in the College of Engineering.

Character and Objectives of Program: The courses in the certificate program provide students with fundamentals of mechanical behavior as well as with advanced practical information on design and materials selection. As such, it supports their research programs in the MPRL and various academic units. This certificate program also meets the needs of industry for high-level practitioners for which materials/mechanics considerations are primary design obstacles.

Mode of Operation: This multidisciplinary certificate presently involves faculty members from the Schools of Aerospace Engineering, Civil and Environmental Engineering, Materials Science and Engineering, and Mechanical Engineering, though others outside of these schools can qualify if they meet the requirements of the certificate program.

In consultation with his/her advisor, the student selects courses that constitute a coherent sequence from an approved list (see attached forms). The student then sends the proposed program to the MPRL Director for review and approval. Upon successful completion of the program, a recommendation is forwarded by the MPRL Director to the Dean of Engineering for final approval similar to other existing certificate programs.

COURSE OF STUDY*

REQUIREMENTS

- 12 hours from the following list, with at least three (3) hours from the core course category.
- Nine (9) hours must be at the 6000 level or higher.
- Must earn C or better in each course.

CORE COURSES

1. ME/MSE/CEE/AE/CHBE 7772. Fundamentals of Fracture Mechanics
2. MSE/ME/CEE/AE/CHBE 7774. Fatigue of Materials and Structures

OTHER COURSES

1. ME 6203. Inelastic Deformation of Solids, or
   CEE 6566. Plasticity and Viscoelasticity, or
   AE 6112. Inelastic Response
2. ME 6204. Micromechanics of Materials
3. ME 7203. Advanced Constitutive Relations for Solids
4. AE/ME/MSE/CHBE 7775. Topics in Fracture and Fatigue of Metallic and Composite Structures**
5. MSE 7210. Dislocation and Deformation Mechanics
6. PTFE/CHBE/MSE/ME 7771. Mechanics of Polymer Solids and Fluids
7. AE/MSE/ME/PTFE/CEE/CHBE 4791. Mechanical Behavior of Composites
8. AE/MSE/ME/PTFE/CEE/CHBE 7791. Damage, Failure and Durability of Composite Materials
9. AE/MSE/ME/PTFE/CEE/CHBE 7792. Advanced Mechanics of Composites
10. CEE 6521. Reinforced Concrete Members
11. CEE 6571. Experimental Stress Analysis
12. PTFE/CHBE/MSE/ME 6768. Polymer Structure, Physical Properties and Characterization
13. ME/MSE/PTFE 6796. Structure-Property Relationships in Materials
14. MSE 4010. Environmental Degradation of Materials
15. ME 7201. Computational Mechanics of Materials, or
    CEE 6507. Nonlinear Finite Element Analysis
16. AE/CEE/CHBE/ME/MSE/PTFE 8000 level Special Topics Courses as approved by certificate administration.

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* Certificate program prerequisites include MSE 2001 or equivalent, and COE 3001 or equivalent.

** Not allowed if MSE/ME/CEE/AE/CHBE 7774 is taken as a core course.

PROPOSED PROGRAM OF STUDY:
COLLEGE OF ENGINEERING MULTIDISCIPLINARY CERTIFICATE IN MECHANICAL PROPERTIES OF MATERIALS

Student: _____ **School:** _____

Advisor: _____

Certificate program prerequisites include MSE 2001 or equivalent, and COE 3001 or equivalent. Satisfied? Yes ___ No ____

Proposed courses:

A. Required Core Course (check at least one)
- ☐ ME/MSE/CEE/AE/CHBE 7772.
- ☐ MSE/ME/CEE/AE/CHBE 7774.

B. Electives (check two or more as appropriate to obtain at least 12 hours)
- ☐ ME 6203 or CEE 6566 or AE 6112
- ☐ ME 6204
- ☐ ME 7203
- ☐ AE/ME/MSE/CHBE 7775 *
- ☐ MSE 7210
- ☐ PTFE/CHBE/MSE/ME 7771
- ☐ AE/MSE/ME/PTFE/CEE/CHBE 4791
- ☐ AE/MSE/ME/PTFE/CEE/CHBE 7791
- ☐ AE/MSE/ME/PTFE/CEE/CHBE 7792
- ☐ CEE 6521
- ☐ CEE 6571
- ☐ PTFE/CHBE/MSE/ME 6768
- ☐ ME/MSE/PTFE 6796
- ☐ MSE 4010
- ☐ ME 7201 or CEE 6507
- ☐ AE/CEE/CHBE/ME/MSE/PTFE 8000 level Special Topics Courses - PLEASE DESCRIBE IN SOME DETAIL

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* Not allowed if ME 7774 is taken as a core course

Date certificate petition is anticipated: _____

Please send this page and the attached *Multidisciplinary Certificate Petition* to:
Richard W. Neu, MPRL Director
Mechanical Engineering, CAMPUS 0405
e-mail: rick.neu@me.gatech.edu

COLLEGE OF ENGINEERING

Multidisciplinary Certificate Petition

The petition for a Multidisciplinary Certificate should be submitted to the Dean of Engineering during or immediately following the semester in which the student graduates.

Student

Please type or print name as you wish it to appear on the Certificate.

_____

First Name Middle Last

_____

Permanent or post-graduation mailing address

respectfully petitions for a Multidisciplinary Certificate in Mechanical Properties of Materials

Major School _____Degree _____

Expected Date of Graduation (month and year)_____

Student's signature_____ Date _____

Certificate Committee Chair

List below ONLY the courses which apply to the multidisciplinary certificate.

Completed Courses			Present Schedule		
Course	Number	Grade	Course	Number	Grade
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

It is recommended that this student receive a Certificate for the Multidisciplinary Program in

_____Mechanical Properties of Materials_____

Signed by Certificate Committee Chair_____ Date _____

Prof. Richard W. Neu, Director of MPRL

Dean of Engineering

Verification of completion of graduation requirements:

Degree_____ Date_____

Petition approved by Dean_____ Date_____