

GRADUATE EMBEDDED 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.

A multidisciplinary certificate program consisting of coursework 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.

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.

This multidisciplinary certificate presently involves faculty members from the Schools of Aerospace 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.

Program of Study

| Code | Title | Credit Hours |
|---------------------------|--|--------------|
| Core Courses | | 3 |
| ME/MSE/ CEE/AE 7772 | Fundamentals of Fracture Mechanics | |
| ME/MSE/ CEE/AE 7774 | Fatigue of Materials and Structures | |
| Other courses | | 9 |
| ME/MSE/ CEE/AE 7773 | Advanced Fracture Mechanics | |
| ME/AE 7775 | Topics in Fracture and Fatigue of Metallic and Composite Structures ¹ | |

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| ME 6203 | Inelastic Deformation of Solids |
| MSE 7210 | Dislocation and Deformation Mechanics |
| ME/MSE/ CHBE 7771 | Mechanics of Polymer Solids and Fluids |
| ME/CEE/ CHBE/AE 4791 | Mechanical Behavior of Composites |
| ME/MSE/ CEE/ CHBE/AE 7791 | Damage, Failure, and Durability of Composite Materials |
| ME/MSE/ CHBE 6768 | Polymer Structure, Physical Properties, and Characterization |
| ME 6796/6796 | Structure-Property Relationships in Materials |
| ME/MSE/ AE/CHBE 8803 | Special Topics in Manufacturing ² |

Total Credit Hours **12**

¹ Not allowed if ME 7774 is taken as a core course.

² Special Topics courses as approved by certificate administration.