Materials Science and Engineering Certificate Program

1 course from Level I, 2 courses from Level II, 1 course from Level III, and a 3-Hr Directed Study course are required to complete the certificate program:

**LEVEL I**

**Fundamental Materials Course**
- ABE 3813 Biophysical Properties of Materials
- CE 3314 Construction Materials
- ChE 3413 Engineering Materials
- ME 3403 Materials for ME Design

**Level II**

**Intermediate Material Courses**
- CE 4633 Concrete Structures
- ChE 4143 Advanced Polymeric and Multicomponent Materials
- ECE 3213 Solid State Electronics
- ECE 4243 Introduction to Physical Electronics
- EM 4133 Mechanics of Composite Materials
- FP 4423 Mechanical Properties (of Wood)
- PH 3613 Modern Physics
- ME 4133 Mechanical Metallurgy

**Level III**

**Advanced and or Applied Courses**
- ABE 4523 Biomedical Materials
- ABE/ChE/ME 4624 Experimental Methods in Materials Research
- ABE 8314 Corrosion of Biomedical Implants
- ChE 4423 Fundamentals of Industrial Corrosion
- ChE 4153 Particle and Crystallization Techniques
- ChE 4163 Nanotechnology in Chemical Applications
- ECE 4283 Microelectronics Process Design
- ECE 4293 Nano-electronics
- EPP/ME 8144 Transmission Electron Microscopy
- EPP 8223 Scanning Electron Microscopy
- ME 4123 Failure of Engineering Materials
- ME 4533 Fundamentals of Nanomechanical Engineering
- PH 4813 Introduction to Solid State Physics
- ME 4413 Casting and Joining

For further information about the program, contact:

Materials Working Group (MWG)
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What Else Should I Know?

Course offerings in support of the Materials Certificate Program are regularly updated and listed on the engineering homepage (www.enger.msstate.edu). On the engineering homepage, please select the Research link, where you will find Working Groups where the Materials Working Group is listed.

Mississippi State University complies with all applicable laws regarding affirmative action and equal opportunities in all activities and programs and does not discriminate against anyone protected by law because of age, color, disability, national origin, race, religion, sex, handicap, or status as a veteran or disabled veteran.
Materials related courses may be found in the following Engineering Departments: Aerospace, Biological, Chemical, Civil, Electrical/Computer, and Mechanical; as well as in Chemistry, Physics and Astronomy, and the College of Forest Resources. Other related courses are often presented through collaboration with staff at the following Centers: ERC/Center for Advanced Vehicular Systems (CAVs), ERC/Center for Computational Sciences, Institute for Clean Energy Technology (ICET), Institute for Imaging & Analytical Technologies (I2AT) and the Raspet Flight Research Laboratory. These departments and programs offer exciting research and education opportunities in a variety of contemporary research fields:

- Nanomaterial processing and modeling
- Polymers and polymeric composites
- Casting and fusion welding
- Solid state welding or joining
- Fatigue and fracture
- Metallurgy
- Electronics and semiconductors
- Organic superconductors
- Ceramics
- Corrosion
- Waste remediation and recycling
- Computational materials
- Biomaterials
- Tissue engineering substrates
- Materials design and selection

To be admitted to the Materials Certificate program, students must first successfully complete freshman chemistry (CH 1213, CH 1223), freshman calculus (MA 1713, MA 1723), and physics (PH 2213, PH 2223).

To receive the Materials Certificate, students must then complete four additional courses which includes a three hour Directed Study course under the direction of a faculty member of the Materials Working Group. The student may select from the various "Level" courses listed on the reverse.

A grade of “C” or better must be attained in all four courses, including the Directed Study course. Only one course in Level II can be from the Special Topics category.

In all cases, it is the student’s responsibility to provide official transcripts of all courses taken prior to admission into the program.

An application form, including a proposed course of study, must be completed by the student in consultation and agreement by a faculty in the Materials Working Group.