

## 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

## What Else Should I Know?

**C**ourse offerings in support of the **Materials Certificate Program** are regularly updated and listed on the engineering homepage ([www.enger.msstate.edu](http://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.

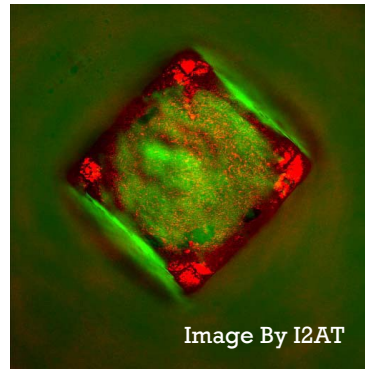


Image By I2AT

**For further information about the program, contact:**

### Materials Working Group (MWG)

**Yaroslav Koska, MWG Chair**

**Phone: 662-325-2411**

**Fax: 662-325-9478**

**E-Mail: [ykoshka@ece.msstate.edu](mailto:ykoshka@ece.msstate.edu)**



**MISSISSIPPI STATE  
UNIVERSITY**

*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.*

MISSISSIPPI STATE  
UNIVERSITY

## Materials Science and Engineering

Certificate Program



Image By I2AT



JAMES WORTH  
**BAGLEY**  
COLLEGE OF ENGINEERING  
MISSISSIPPI STATE UNIVERSITY

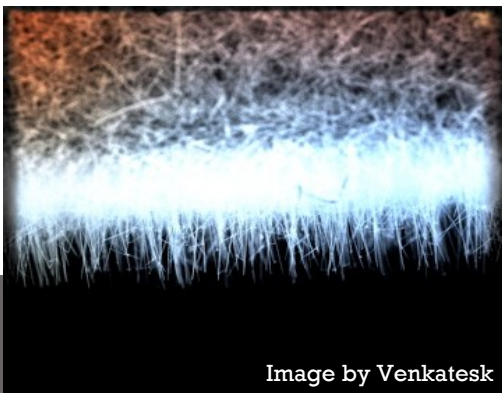


Image by Venkatesk

## Program Information

The Materials Certificate Program, administered through the Bagley College of Engineering, is available to qualified students who complete an organized plan of study in the interdisciplinary field of materials science and engineering at Mississippi State University.

The University's various departments offer a range of materials—related courses in both the science and engineering fields, such as biomaterials, electronic and semiconductor materials, composites, polymers, metals, ceramics, and construction materials. We also have a wide range of supporting courses in the areas of materials modeling, mechanics, processing, and characterization, along with special topics in fatigue, fracture, and corrosion.

As part of an organized plan of study, including Directed Study courses under the direction of a Materials Faculty Member, these courses allow students to pursue an interdisciplinary education and training program tailored to individual interests.

The Materials Certificate Program is available to both traditional and non-traditional students. This allows industry to offer employees further training in materials, as well as provide current university students the opportunity to pursue an interdisciplinary materials specialty.

## Participating Departments

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 (I<sup>2</sup>AT) 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

*The **Materials Working Group** is a group of faculty in various disciplines across campus, with a strong interest in promoting teaching and research in the area of materials science and engineering. Find us at [www.engr.msstate.edu](http://www.engr.msstate.edu), Under the Working Group Link and select Materials Working Group.*

## How The Program Works

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.



Image by Goglick