

### For More Information

The UF EDGE Web site offers extensive information about our programs, as well as the application and registration process.

UF EDGE  
E-117 CSE  
P.O. Box 116100  
Gainesville, FL 32611-6100

P: 352.392.9670  
F: 352.846.2255

e-mail: [UFEDGE@eng.ufl.edu](mailto:UFEDGE@eng.ufl.edu)  
[www.ufedge.eng.ufl.edu](http://www.ufedge.eng.ufl.edu)

UF EDGE offers Master of Science Degrees and Certificate Programs from seven of our highly-ranked engineering departments. Check out our Web site for online programs available through the UF College of Engineering and UF EDGE to find the online program that meets your continuing education needs.

**Civil & Coastal Engineering**

**Computer & Information Science & Engineering**

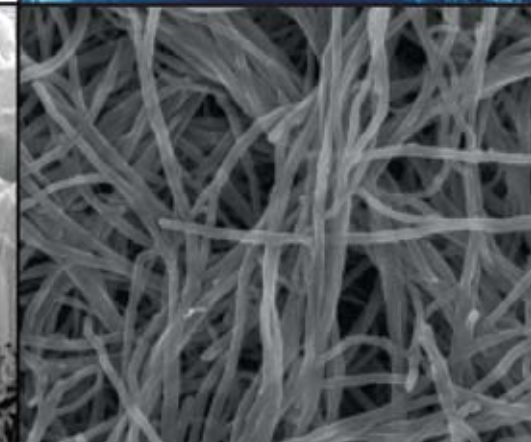
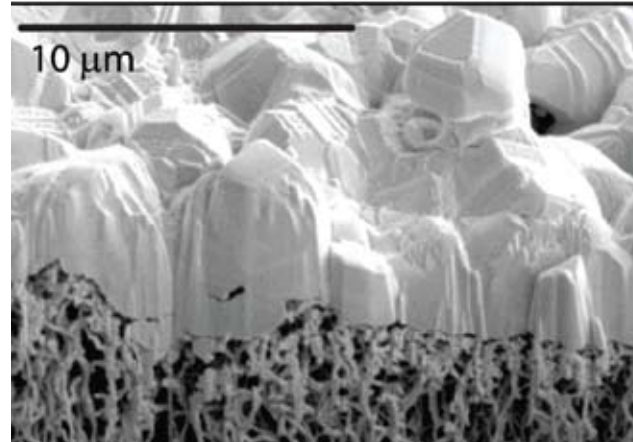
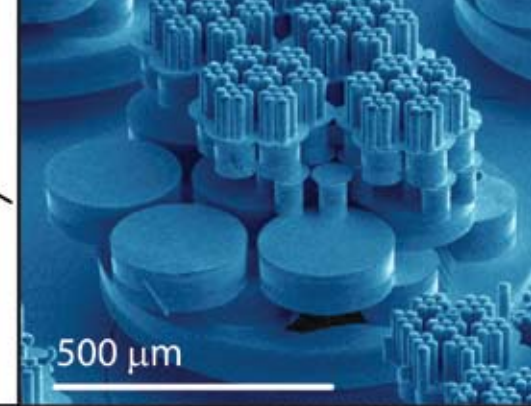
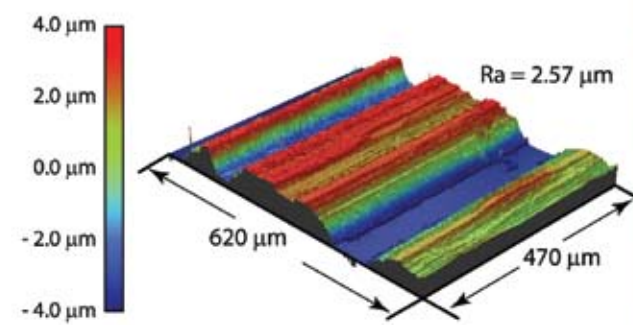
**Electrical & Computer Engineering**

**Environmental Engineering Sciences**

**Industrial & Systems Engineering**

**Materials Science & Engineering**

**Mechanical & Aerospace Engineering**



## University of Florida Materials Science and Engineering Certificate in Materials Characterization

### Give Your Career that UF EDGE

Get a Graduate certificate in materials characterization from the Materials Science & Engineering Department at the University of Florida.

This online certificate is an opportunity for multidisciplinary scientists and engineers with various educational backgrounds to learn more about current materials characterization techniques.

If you have seen an increase in the use of characterization techniques in your industry and want to learn more about these techniques and how they can be used in your company you can do it completely online from our top-ten ranked Materials Science & Engineering Department at the University of Florida.

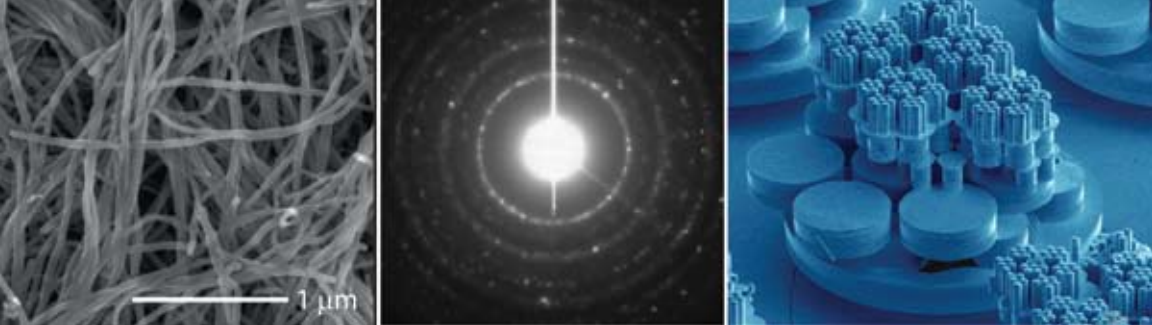
**UF UNIVERSITY of FLORIDA**  
*The Foundation for The Gator Nation*

E-117 CSE  
PO Box 116100  
Gainesville, FL 32611-6100

Non-Profit  
Organization  
US Postage  
PAID  
Permit No. 94

[www.ufedge.eng.ufl.edu](http://www.ufedge.eng.ufl.edu)

University of Florida  
**UF EDGE**  
*Electronic Delivery of Graduate Engineering*



The courses comprising this certificate are designed to help working engineers and scientists expand their knowledge of characterization techniques, expose them to new available methods for evaluation and give them a competitive edge in improving their materials, products and research techniques.

The characterization methods covered in these online courses will give detailed insight into techniques used for quality control, multi-scale imaging, composition evaluation and quantifiable material and surface characteristics for setting and checking industry standards for composition, integrity and surface finishes.

### Online, Any Time, Any Place

This certificate is being offered by the Materials Science & Engineering Department through the UF EDGE (Electronic Delivery of Graduate Engineering) Program. UF EDGE makes a high-quality graduate education available no matter where you live or work with complete online delivery.

Lectures are available online in streaming video, downloadable video and Podcast formats all semester making it easy for students to go back and review material before exams. Distance learning students view courses online, submit coursework online or via fax and interact with professors and teachers assistant's using e-mail, phone and course Web sites; students are never required to travel to campus. Exams are proctored at their place of work and are faxed in for grading.

UF EDGE also works with companies that support continuing education with the option for either the student or the company to pay tuition based on how their human resources office is set up to finance continuing education.

### Admission Requirements

The certificate program is open to all scientists and engineers, with various educational backgrounds, that are interested in learning more about these characterization techniques. Courses are instructed at a graduate level, but there are no specific requirements precluding admittance into the certificate program. Successful completion of the certificate requires students to earn a B or better in all three courses they take.

Online courses included in this certificate program are the same graduate level courses taught on-campus in the Materials Science & Engineering Department at the University of Florida.

Characterization methods and theory covered in this online certificate program relate to:

- surface composition
- microstructure
- surface roughness
- particle distribution
- subsurface structure
- thin films and coatings
- powders
- grain size
- wear of materials
- scratch testing
- hardness
- imaging techniques

Students completing the materials characterization certificate can also count the 3 certificate courses towards a 10 course online master's degree from the Materials Science and Engineering department at the University of Florida. Continuation towards a master's degree requires students to meet graduate admission requirements into the MSE department.

### Materials Science and Engineering Department

The University of Florida's (UF) Materials Science & Engineering (MSE) program is ranked among the top ten graduate and undergraduate materials science and engineering programs in the nation. At the undergraduate level, the MSE department offers an ABET-accredited B.S. degree in Materials Science & Engineering with specializations in biomaterials, ceramics, electronic materials, metallurgy, and polymers. At the graduate level, UF EDGE students can specialize in Polymers, Electronic Materials, Metals, Materials Characterization or Structural Materials. [www.mse.ufl.edu](http://www.mse.ufl.edu)

The MSE Department at the University of Florida is home to the Major Analytical Instrumentation Center (MAIC) <http://maic.mse.ufl.edu> MAIC is a materials characterization and analysis facility established to provide analytical support for the scientific and engineering community meeting the challenge of technology development. MAIC is a user-oriented facility that provides service to the university system and the industrial and commercial community. Demonstrations of specific characterizations techniques for the online certificate courses are done using the equipment located at the MAIC.

### Materials Characterization Certificate Structure

A certificate in Materials Characterization consists of three online courses. The course "Survey of Materials Analysis Techniques" is covers a broad range of instrumentation and analysis techniques.

#### EMA 6510: Survey of Materials Analysis Techniques

*(offered every fall)*

This course covers the principles, techniques and instruments used in characterization of materials including chemical, microstructural, and surface analysis of materials for metals, ceramics, polymers, and semiconductor systems. Research and industrial applications will be broadly presented and discussed.

#### EMA 6507: Scanning Electron Microscopy and Microanalysis

*(offered every summer)*

The course is designed to introduce the theoretical concepts of Scanning Electron Microscopy (SEM), Electron Probe Microanalysis (EPMA), and Energy Dispersive Spectroscopy (EDS). Topics covered include

### Contact Information

For more information on the Materials Characterization Certificate or the UF EDGE Program, please feel free contact us anytime.

Ruth Bryant  
UF EDGE  
352.392.9670  
rbyra@eng.ufl.edu  
[www.ufedge.eng.ufl.edu](http://www.ufedge.eng.ufl.edu)

Further questions regarding the MSE graduate program can be obtained via "Live Help" on the MSE department Web site at [www.mse.ufl.edu](http://www.mse.ufl.edu)

Doris Harlow  
MSE Academic Services  
dharl@mse.ufl.edu  
352.846.3315

Martha McDonald  
MSE Academic Coordinator  
mmcd@mse.ufl.edu  
352.846.3312

electron optics, electron beam- specimen interactions, instrument design, operational parameters, image formation and interpretation, specimen preparation, image processing, and data reduction and analysis of X-ray spectra.

#### EMA 6938: Special Topics: X-Ray Diffraction

*(offered every spring)*

This class will present the fundamentals and basic geometries used for powder and thin film x-ray diffraction analysis. The appropriate techniques to solve various problems in materials science and engineering such as: structure characterization, phase composition, grain size measurement, stress measurement, thin film thickness, density and roughness measurements, texture and epitaxial quality.