Application Process

Fall applications are received until August 10 of the current year. Spring applications are received until January 5.

Applicants should submit the followings materials:

- Official transcripts
- Resume
- Virginia Domicile Classification form
- TOEFL scores for foreign nationals
- A $60 check payable to GMU
- GRE scores and recommendation letters are not required.

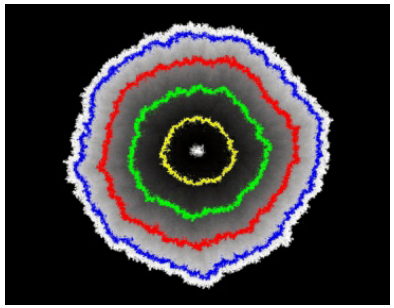
Online application:

http://admissions.gmu.edu/grad/

Application by mail:

Admissions Office, College of Science
4400 University Dr, MSN 6A3
Fairfax, VA 22030

Certificate Coordinator:
Prof. Estela Blaisten-Barojas, 703-993-1988,
blaisten@gmu.edu



GEORGE MASON UNIVERSITY

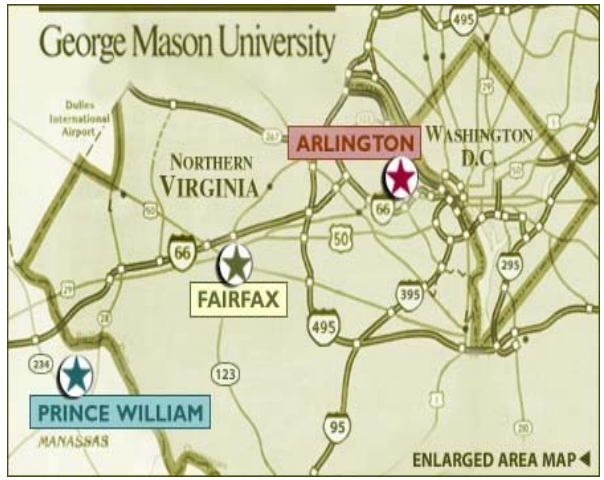
GEORGE MASON UNIVERSITY

Department of Computational &Data Sciences

George Mason University

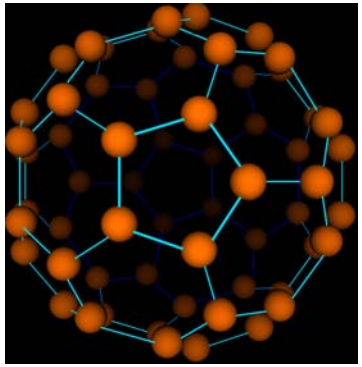
4400 University Dr., MSN 6A2

Fairfax, VA, 22030



http://nano.gmu.edu/certificate.htm

Graduate Certificate in Nanotechnology and Nanoscience

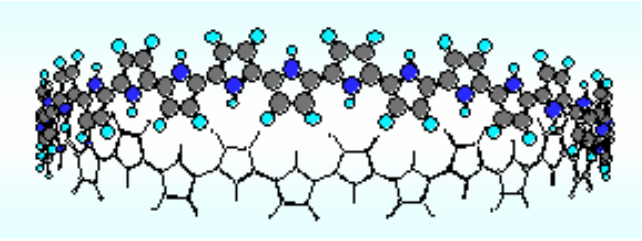


GRADUATE CERTIFICATE IN NANOTECHNOLOGY AND NANOSCIENCE

Nanotechnology and nanoscience are of great importance in a wide range of industries and are fundamental for the success of the region and the nation in the 21st century. Hence it is imperative that these fields be incorporated into the education of the next generation of applied scientists and engineers.

The Graduate Certificate in Nanotechnology and Nanoscience addresses the need to increase the number of qualified professionals in these critical research areas. This program is attractive for professionals who wish to benefit from the employment boom in the nanoscience fields. Graduates are well prepared to fill the demand for personnel with nanoscience training who can serve as process controllers in area fabrication facilities, and/or participate as members of interdisciplinary science teams.

Ideal candidates for this program have a background in physical or chemical sciences or in any branch of engineering, and are either currently working in, or planning to enter into,



the fields of nanotechnology and nanoscience.

Curriculum Requirements

The Graduate NANO Certificate requires a total of 15 credit hours, or five 3-credit courses. Students are required to take three core courses, plus two courses selected from the list of electives indicated below. One of the electives has to be a 600-level course.

Core Courses (all are required):

- NANO 500 Introduction to Nanomaterials and Interactions (3 credits) -- Offered Fall 2008, Dr. Veytsman
- NANO 510 Strategies for nanocharacterization (3 credits) -- Offered Fall 2009, Dr. Guharay
- NANO 520 Survey of Nanostructures (3 credits) -- Offered Spring 2008, Dr. Coskuner

Elective Courses:

- NANO 530 Nanofabrication (3 credits) -- Offered Fall 2008 ,Dr. Ikossi
- Nano 610 Nanoelectronics (3 credits) -- Offered Spring 2008, Dr. Ioannou
- NANO 620 Computational Modeling in Nanoscience (3 credits) -- Offered Spring 2008, Dr. Sheng

http://nano.gmu.edu/certificate.htm

Catalog Descriptions of Two NANO Courses:

◆ **NANO 500 Introduction to Nanomaterials and Interactions** (3:3:0). Prerequisites: admission into the Graduate Certificate in Nanotechnology and Nanoscience. Introduction to nanotechnology. Discussion of the Feynman challenge and its relation to modern science. Atoms and states; a review of quantum mechanics; energy levels; excitations. Includes light absorption and luminescence; covalent and hydrogen bonds in nanostructures and polymers; conformations of polymers; random walks; biological nanostructures and bio-inspired self-assembly. Discussion covers collective effects in nanostructures; one-dimensional lattices; delocalization; electron spectrum; proton excitations. Emphasis on two-dimensional and three-dimensional lattices. Applications to nanostructures of charges, currents, diamagnetics, paramagnetics and ferromagnetics.

◆ **NANO 510 Strategies for Nano characterization** (3:3:0). Prerequisites: NANO 500 and admission into the Graduate Certificate in Nanotechnology and Nanoscience. Introduces various nanocharacterization techniques, with a discussion of which techniques are most useful in various applications. Spacial resolution and detection methods in several-electron microscopy techniques (SEM, TEM, LEED). Ion-bean techniques, surface techniques and their limitations. Mass spectrometry (MALDI, cluster desorption), as well as STM and AFM techniques. IR and Multiwavelength spectroscopies. Includes gates and bridges; chemical thermodynamics; kinetics; and solid-state reactions. Various nanomaterials are treated such as metals, ionic crystals, and semiconductors. Solid-vapor phase thermal sublimation. Piezolectric and pyroelectric mechanisms. Polar surfaces in nanodevices, and catalytic reactions.