

Applied Science Department The College of William & Mary in Virginia



Applied Science is an interdisciplinary graduate department which offers M.S. and Ph.D. degrees in the physical and biological sciences. Courses are offered cooperatively by the core faculty of Applied Science along with affiliated faculty from the Departments of Biology, Chemistry, Computer Science, Mathematics, Physics, and the Virginia Institute of Marine Sciences (VIMS), as well as from the NASA Langley Research Center (LaRC) and the Thomas Jefferson National Accelerator Facility (Jefferson Lab). In Applied Science we use the tools, the techniques, and the understanding involved in a wide range of sciences in order to solve complex scientific and technical problems. The Department has state-of-the-art facilities in: (1) theoretical and computational analysis of physical and biological systems, (2) cellular and systems neurophysiology, (3) materials synthesis and characterization of small molecules, polymers, inorganics, and composites, (4) modification and evaluation of interfaces, (5) processing of materials and surfaces, and (6) imaging technology and theory from nano to planetary scales.

While Applied Science does not offer an undergraduate major, several courses in the department are particularly suitable for undergraduate students of physics, mathematics, chemistry, computer science, and biology. A minor in Applied Science is offered with a track in either Computational Biology or Materials Science. The minor in Applied Science permits a number of courses from other departments to count in the total credits (see the description below).

Introductory Undergraduate Courses offered by Applied Science

150W Freshman Seminar: Applied Pseudoscience. Spring (4 credits) This course offers a brief introduction to the scientific method, and then explores systematically a variety of paranormal phenomena (UFO's, ESP, Bermuda Triangle, etc.) It will help students to distinguish legitimate scientific discoveries from the bogus claims of tricksters and fools.

201 Introduction to Materials Science. Spring (3 credits) This course is intended as an introductory course for the Materials Science minor in Applied Science. The role materials have played and will continue to play in shaping society will be discussed.

APPLIED SCIENCE MNOR (Two Tracks)

Six designated courses (see below), including independent research (at least 2 credits) and totaling at least 18 credits. Required Research Experience: APSC 402 *or* 404 *or* 495-496 (2 to 4 credits), *or* pre-approved Senior Research projects from other departments. *Two tracks are available:*

TRACK ONE: COMPUTATIONAL BIOLOGY. Take 2 of 3 required courses: APSC 451 Cellular Biophysics and Modeling; APSC 452 Networks in the Brain and Biology; APSC 453 Introduction to Bioinformatics. **Additional courses may be selected from the following:** APSC 312 Medical Imaging; BIOL 404 Topics in Biotechnology; BIOL 406 Molecular Cell Biology; BIOL 442 Molecular Genetics; MATH 302 Ordinary Differential Equations; MATH 351 Applied Statistics, MATH 410 Mathematical Biology; MATH 441/442 Introduction to Applied Mathematics; CHEM 341 Principles of Biophysical Chemistry. *Additional APSC Graduate courses that may be taken and counted with instructor permission:* APSC 631 Applied Cellular Neuroscience; APSC 632 Applied Systems Neuroscience; APSC 751 Mathematical Physiology I; APSC 752 Mathematical Physiology II.

TRACK TWO: MATERIALS SCIENCE. Take 3 required courses: APSC 201 Materials Science; APSC 301 Mechanics of Materials; APSC 422 Intro Materials Characterization. **Additional courses may be selected from the following:** APSC 312 Medical Imaging; APSC 327 Lasers in Biomedicine; APSC 402 Applied Quantum Mechanics; APSC or CHEM 411 Polymer Science I; APSC or CHEM 412 Polymer Science II; APSC or CHEM 416 Polymer Laboratory; APSC 474 Continuum Mechanics; CSCI 426 Simulation; MATH 441 Applied Mathematics I; MATH 442 Applied Mathematics II; PHYS 475 Mathematical Physics. *Additional APSC Graduate courses that may be taken and counted with instructor permission:* APSC 607 Mathematical and Computational Methods I; APSC 608 Mathematical and Computational Methods II; APSC 621 Applied Solid State Science; APSC 623 Materials Science of Surfaces and Interfaces; APSC 627 Lasers in Medicine, Science, and Technology; APSC 637 Intro. to Optoelectronics. APSC 671 Solid State Nuclear Magnetic Resonance.

For more information, please see the College Catalog or contact the department at (757) 221-2563 or info@as.wm.edu.

<http://as.wm.edu>