

Computational science is the unique combination of mathematics and computer science applied to problems in the natural, behavioral and physical sciences. Integrating knowledge from several disciplines, the minor in computational science provides a distinct advantage to future leaders in an increasingly technical world. The Wittenberg Integrated Computational Science Program emphasizes interdisciplinary applications preparing students for opportunities and challenges of tomorrow.

### Program Strengths

- **Leadership and History** – Established in 2003, the Wittenberg computational science minor has a history of proven success, developing and graduating competitive minors since 2004. In 2004, the US Department of Energy provided significant support to further expand the program, introducing new courses in bioinformatics and computational chemistry.
- **Strong Faculty** – Wittenberg faculty are experienced and committed to developing students as future leaders in computational science. An ongoing initiative builds inter-relationships among departments in areas of applied computational science. In addition, multiple Wittenberg faculty have established a solid record of contributing to National Science Foundation projects in computational science.
- **Flexibility** – Majors from several disciplines including biology, biochemistry and molecular biology, chemistry, mathematics, computer science, physics, economics and geology can all readily complete the computational science minor. Computational science minors may also augment their education with courses from the Ralph Regula School of Computational Science, a pioneering Ohio initiative to prepare a technical workforce employing computational science for innovation.
- **Internships and real-world experiences** – Wittenberg provides tremendous opportunities for real-world experiences in computational science for its minors. Wittenberg students have added internships to their educational experience from such prestigious and unique venues as Wright-Patterson Air Force Base, the Ohio Supercomputer Center, Columbus Children's Hospital, Leadscope, Princeton University, Carnegie-Mellon University, SAIC and Edaptive Computing.
- **Facilities** – Wittenberg provides on-campus high-performance computing resources with the WARP 32 processor Linux cluster. The cluster provides students critical hands-on experience in using advanced computational science applications. This cluster is augmented with several discipline-focused computing labs. Students at Wittenberg may also use the advanced computing resources available at the Ohio Supercomputer Center.

## Wittenberg Computational Minor Overview

The Wittenberg Computational Science minor is designed to augment several established majors, enabling students to maintain a major focus plus develop critical experience in complementary technical areas. The following provides a quick overview of the computational expertise areas developed in the computational science minor.

### Required Course Topics

Introduction to Programming  
Calculus  
Computational Models and Methods

### Elective Course Areas\*

Biology  
Chemistry  
Economics  
Geology  
Math and Computer Science  
Physics

\*specific courses within these areas are approved for the minor

The Wittenberg Computational Science minor also incorporates experiential learning through a capstone project and internships. Several options are available for the capstone project including a senior thesis, an honors project, an internship related project, an independent study, a self-directed research project or a project related to a Wittenberg summer program.

Projects and internships have included applications in:

- *Drug discovery*
- *Material studies for nanotechnology*
- *New materials for storing energy*
- *Virtual pathology*
- *Database development*
- *3D Visualization of dynamic systems*
- *Quantum chemistry of polymers*
- *Software development*

Students from diverse fields of study have enhanced their Wittenberg education experience through activities in computational science including majors from:

- *Biochemistry Molecular Biology*
- *Biology*
- *Chemistry*
- *Chinese*
- *Computer Science*
- *French*
- *Mathematics*
- *Physics*

For more information:

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Visit [www.wittenberg.edu/computational\\_science](http://www.wittenberg.edu/computational_science) for the latest information on this leading program.

## **Computational Science Fast Facts**

**Computational Science Minor Established: 2002-2003**

### **Departments Represented on Computational Science Faculty Committee**

- Mathematics
- Computer Science
- Chemistry
- Biology
- Economics
- Geology
- Physics

**4 faculty developing computational science educational modules for NSF funded project (2007)**

**19 Computational Science Minors declared since establishing minor (as of 2007)**

### **Awarded \$946,000 by US DOE to build Computational Science program supports**

- Internships
- Scholarships
- Faculty development
- Student research
- Hardware
- Software

**On-site 32 processor Linux cluster for high-performance and parallel computing**

### **Fields of study for Computational Science Interns**

- Biochemistry Molecular Biology
- Physics
- Mathematics
- Computer Science
- Biology
- Chemistry
- French
- Chinese

### **Organizations already benefiting from Wittenberg Computational Science Internships**

- Wright-Patterson AFB Materials Laboratory
- The Ohio Supercomputer Center
- Wittenberg University
- Columbus Children's Hospital
- Princeton University
- Leadscope
- SAIC (Scientific Applications International Corporation)

## **Computational Science Faculty Committee**

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