



# GENEVA COLLEGE

## *Department of Computer Science, Mathematics & Physics*

### MISSION

The mission of the Department of Computer Science, Mathematics & Physics is to educate and minister to students by developing an understanding and appreciation of the fields of computer science, mathematics and physics in order to produce professional practitioners who will glorify God.

### OVERVIEW

Majors in the Department of Computer Science, Mathematics & Physics build foundations for careers that create and support the products and techniques that shape contemporary society. Computing, transportation, communication, health services, education, research, simulation, manufacturing, quality control and even finance depend upon the expertise developed in these fields. The understanding gained from our programs equips our students with the versatility to adapt to a changing marketplace as well as providing excellent preparation for graduate school. The entire curriculum is rooted in a Christian worldview which enables our students to combine their technical training with their understanding of God's purpose in creation, contributing through their work to the kingdom of God.

### FACILITIES AND EQUIPMENT

Students complete most of their major coursework in the recently-renovated Science & Engineering building. This facility features dedicated laboratories and equipment designed to provide students with hands-on experience in their field of interest. This includes research grade electronics, general and specialized computer laboratories, optical and other measurement equipment, and plans for a new computer automated observatory.

### APPLIED MATHEMATICS

As stewards of God's creation, we are given the precious tool of mathematics. The department offers training focused on the mathematics used in science and engineering, but also offers training in the theory of mathematics. Graduates in applied mathematics pursue a surprisingly wide variety of careers such as scientific research, forecasting, simulation, statistical analysis, consulting services, national security, aerospace, and higher education.

### MATH EDUCATION

Geneva's math education program meets Pennsylvania's requirements for certification and those of most other states. In addition to Geneva's core courses, students interested in

teaching math at the secondary level must complete State-mandated course requirements both in mathematics and in professional education and also must apply for admission to professional education by the end of the second year. The education portion of the curriculum covers issues such as technology in the classroom, teaching methods, methods of assessment and exceptionalities in the classroom. The mathematics portion of the curriculum includes most of the math courses taken for the applied mathematics major.

### COMPUTER SCIENCE

The swiftly changing nature of computer science requires computer professionals to have a breadth of basic knowledge to understand and adapt to advances in both hardware technology and software development techniques. Our program provides this breadth through a set of courses common to all computer science majors. This common core includes courses in programming, software engineering, computer architecture, operating systems, and networks. Despite its requirement for significant breadth, the field of computer science is too large for any single person to be expert in the entire field. Consequently, a depth of knowledge in one particular area is necessary. Our program provides depth by requiring that each student select one of the following areas of concentration.

#### CS - HARDWARE

The hardware concentration focuses on design and application of microprocessors, culminating in a course in embedded systems. This concentration prepares the student to work more closely with hardware in general and embedded systems in particular. Typical jobs for students in this concentration include design of hardware and/or software of specialty systems primarily for embedded systems, like aerospace equipment, medical devices, hand-held devices, and telecommunication equipment.

#### CS - INFORMATION SYSTEMS

The information systems concentration focuses on the application of computer technology to the particular problems and constraints that occur in business. This concentration enables students to analyze data and systems to extract meaning for the manager and support operations within a business environment. Typical jobs for students in this concentration include management of database systems, information systems, data mining applications, and support of all business information needs.

## CS - SCIENCE/MATH PROGRAMMING

The science/math concentration focuses on the math and physics background needed to apply the computer to complex problems in math, science, and engineering. This concentration enables the student to work with teams of engineers, mathematicians, and scientists by providing the bridge between their technical theory and the constraints inherent to computer applications. This concentration also prepares students for graduate study in computer science. Typical jobs include consulting for manufacturing applications, scientific research, pharmaceutical research, national security applications, and other applied mathematics areas.

## CS - WEB TECHNOLOGY

The web technology concentration focuses on the design and maintenance of software systems for the Internet and World Wide Web. This concentration prepares the student to design, implement and consult on applications used in electronic commerce, information distribution and retrieval, business applications, and human-computer interactions. Typical jobs for this concentration include web engineering, network design & administration, computer security, and web application security.

## PHYSICS

The physics major prepares students to explore the laws by which God governs the physical universe. These principles underlie advances in other scientific fields and applications in engineering and technology. Mathematics is the primary tool used to develop understanding of the design of God's creation. In any field studying the material creation, the pursuit of fundamental understanding leads to physics.

Geneva's physics program provides a solid foundation in all areas of the discipline, preparing students for success in industry or graduate education. Because physics majors are trained to use mathematics to analyze complex systems in terms of fundamental principles, they make valuable contributions in unexpected areas.

## OUTCOMES

The job demand for all majors within the Department of Computer Science, Mathematics & Physics remains strong because of the rapid development and implementation of technology. Additionally, students prepared with Geneva's emphasis on Christian worldview are better suited for a job market that values ethics and well-rounded, critical thinking.

## INTERNSHIPS

Through Geneva's internship programs, students can gain the ultimate credential before graduation—a resume of professional experience in well-known companies. Local organizations that have recently sponsored our students in internship positions include Management Science Associates, Horsehead Corporation, U.S. Steel, and the Technology Services department at Geneva. In addition to internships, our students often collaborate with engineering students on projects sponsored by the Center for Technology Development which accepts real-world engineering projects from local businesses and organizations.

## OUR FACULTY

**JANET HINES** (1996), Assistant Professor of Computer Science; B.S., B.S.E.E., Geneva College; M.B.A., Robert Morris College; M.S.T., University of Pittsburgh

**PHILIP M. HOLLADAY** (1983), Professor of Mathematics; B.S., M.S., Ph.D., North Carolina State University

**JOHN BOCK SCHAEFER** (1962), Associate Professor of Physics; SB, Massachusetts Institute of Technology; M.S., Carnegie Mellon University; University of South Carolina

**JOHN W. STEIN** (1995), Professor of Mathematics and Astronomy; B.S., Case Institute of Technology; Ph.D., University of Pittsburgh

**LEILA L. WALLACE** (1989), Assistant Professor of Computer Science and Chair, department of Computer Science, Mathematics, and Physics; B.S., Geneva College; M.S., University of Pittsburgh

**KEITH WILLSON** (2005), Assistant Professor of Mathematics and Physics; B.S., Geneva College; M.S., Carnegie Mellon University; Ph.D., Carnegie Mellon University



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3200 College Avenue, Beaver Falls, PA 15010 | [www.geneva.edu](http://www.geneva.edu)

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