



COLLEGE OF Science

ARE you interested in preparing for professional school in medicine, dentistry, pharmacy, law, or veterinary medicine? Is it your aim to advance the boundaries of research in science or technology? Whatever your dream, Virginia Tech's College of Science can help you realize it.

The progress being made in the sciences today was only a dream a short while ago, and the departments within the College of Science are on the cutting edge of research and scholarship. The College of Science encourages students to apply knowledge from one field to another and to think creatively, across disciplinary lines. Our alumni are making their marks in the worlds of education, research, business, industry, and government. You can join them. Take a step in the right direction. Explore the College of Science.

Majors:

- biochemistry
- biological sciences
- chemistry
- economics
- geosciences
- mathematics
- physics
- psychology
- statistics

HIGH SCHOOL PREPARATION & ADMISSION TO THE COLLEGE

A challenging college preparatory curriculum is your foundation for success in Virginia Tech's College of Science. Specifically, you must present a minimum of 18 units, including four units of English, three of math (including algebra II and geometry), two units of social science (including history), and two units of lab science (chosen from biology, chemistry, or physics). Three additional college preparatory units

are required, and the balance of the credits is your choice. Sciences majors who have completed three years of the same foreign language in high school are not required to study a foreign language at Tech.

Students should keep in mind that these are just the minimum requirements. Additional college preparatory classes make students more competitive

for admission to certain programs.

Involvement in extracurricular activities, including clubs and organizations related to your field of interest, also are beneficial. In addition to your high school transcript, SAT or ACT (plus writing) scores are required of freshman applicants.

CURRICULUM & OPPORTUNITIES

The College of Science offers baccalaureate degrees in nine disciplines, encompassing the mathematical, psychological, and natural sciences. The flexibility of our programs allows students to create a curriculum tailored to their goals and interests. Students are encouraged to pursue a minor, and double majors are possible as well. The College of Science also offers a minor in actuarial science.

Many of the natural science majors provide excellent preparation for medical, veterinary, and

dental schools. Faculty advisors provide guidance for students who plan to continue their education.

A common emphasis throughout the College of Science is on student involvement in extracurricular activities. You'll find numerous opportunities to develop your talents. For example, we have clubs, undergraduate research projects, internships, academic competitions, field studies, exhibits, student newspapers and magazines, and more.

A new initiative for the college is a set of opportunities to enter the field of Intellectual Property Law.

The program is designed to enrich the curricular offerings made available to students at Virginia Tech, exposing them in their undergraduate years to legal materials and principles of legal reasoning, so they may begin early in their academic careers to see scientific issues through the prism of the legal system and intellectual property concepts. A combined bachelor's degree and University of Richmond law degree includes a streamlined procedure for admission to University of Richmond Law School.

FACULTY & FACILITIES

Students benefit from facilities that enhance their learning experiences, including a variety of laboratories for students interested in physics, biological, chemical, and geological studies, and one of the most powerful computer systems in any university.

Renowned faculty members—including David Kingston, who has patented anti-cancer drugs—enable students to study with the leaders in their prospective fields.

From figuring a mathematical model for

predicting the motions of fluids to understanding the earth's geochemical processes, the faculty's research expertise lends excitement and creativity to the classroom.



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Programs of Study



BIOCHEMISTRY

Biochemistry focuses on the chemical basis of biological processes. Students receive fundamental education in biochemistry, biology, chemistry, physics, and mathematics.

The department offers an option in biotechnology. It is an interdisciplinary program applying fundamental biochemical and molecular biological

approaches to problems in agriculture, medicine, and environmental sciences. The department supports student interest in bioinformatics and genomics.

Qualified students are strongly encouraged to participate in undergraduate research with one or more faculty members. Students are able to creatively use the skills and knowledge obtained in

the classroom and teaching laboratories.

Graduates receive a bachelor of science degree and are prepared for employment as well as for admission to professional schools in medicine, nursing, dentistry, pharmacy, and veterinary medicine. This curriculum also is excellent preparation for post-graduate studies in the life sciences.

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BIOLOGICAL SCIENCES

Biological sciences is the study of life. As such our curriculum provides a broad education in the fundamentals of biology such as ecology, genetics, microbiology, botany, zoology, molecular biology and biotechnology to name just a few. A BS degree in the biological sciences also requires that our students are well versed

in chemistry, organic chemistry, physics and statistics as well which are all part of our curriculum.

The biological sciences curriculum also prepares students for graduate school and professional schools in medicine, dentistry, veterinary medicine, and related fields. Most students pursuing a

B.S. in the biological sciences find employment immediately upon graduation. To enhance professional development and employment potential, faculty members encourage students to participate in undergraduate research opportunities and/or relevant internships.

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CHEMISTRY

Chemistry deals with the properties and energetics of substances—the changes they undergo and the natural laws describing these changes.

The department offers both B.S. and B.A. degrees in chemistry. The B.S. program provides the more rigorous and

theoretical education in chemistry and is approved by the American Chemical Society. The B.A. degree has fewer course requirements, allowing students the flexibility to complete a double major or to meet additional requirements for pre-professional schools. Both the B.A. and

B.S. programs will prepare graduates for post-graduate study or for careers as professional scientists. As an experimental science, the department strongly encourages all chemistry majors to take part in undergraduate research.

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ECONOMICS

Economics is the study of how scarce resources are allocated among competing uses to satisfy human wants. Economic analysis is directed at a wide range of problems, including inflation and recession, environmental problems, taxation decisions, regulatory and antitrust problems, forecasting, and managerial decision making.

Students master the three fundamental activities used in economics: collection, analysis, and interpretation of economic data. Using logical thinking and economic theory to understand data patterns, students predict future trends and

present their conclusions. Economics majors are required to become familiar with sources of information about business and the economy, to analyze data using theoretical models, spreadsheet programs, and statistical techniques, and to present their conclusions both orally and in writing.

A degree in economics prepares students for careers in public policy, consulting, and a wide variety of business organizations. Specific employment opportunities include careers where the ability to analyze and interpret data is valued. In recent years, a large number of

Virginia Tech graduates have found employment in the financial services sector. By developing logical thinking and problem-solving skills, the study of economics also helps prepare students for business school, law school, and other graduate studies. The additional courses in business, help students in the Economics Business program secure employment with companies and government agencies who value their combined skills in economic theory as they are applied in the business and governmental settings.

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GEOSCIENCES

The Department of Geosciences offers exciting opportunities for students with an interest in applying a full range of scientific and mathematical skills to examine the earth's properties and dynamic processes. Understanding the enormously complicated earth systems requires strong quantitative skills and

solid knowledge of chemistry, physics, and biology. Course work in geosciences emphasizes the acquisition, processing, and interpretation of field data, as well as written and verbal communication skills.

Academic programs in geology, geophysics, geochemistry, earth science education and hydrology provide spe-

cialized training for career opportunities in resource (petroleum, minerals, and water) exploration and production, as well as for environmental and disaster management, education, and a host of similar jobs.

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MATHEMATICS

Students in the Department of Mathematics acquire a broad background in pure and applied mathematics and learn how to analyze and solve problems. In the junior and senior years, students choose mathematics courses relevant to their career goals and interests.

Students also take a core of applica-

tions courses in disciplines such as engineering, computer science, statistics, or education.

Many graduates obtain work in government, industry, actuarial firms, or teaching, while others pursue advanced degrees. There are four degree options: applied computational (concentrations

in biology, business, economics, engineering, physics, or statistics), applied discrete (concentration in computer science), education (secondary teaching), and traditional mathematics. Some of the best students in the department are double majors in computer science, engineering, physics, or statistics.

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PHYSICS

Physicists seek to understand nature at the most fundamental and quantitative level. The physics curriculum provides a broad background in scientific inquiry, quantitative problem solving, emerging research frontiers, and communication skills.

Students can pursue either a B.S. or a B.A. according to their career goals. The B.S. is recommended for students inter-

ested in graduate study or in leadership or technical positions in industry or government. It may lead to a 5-year B.S./M.S. for qualified students.

The B.A. allows students to pursue a more flexible program with a strong background in physics. It is ideal for students interested in science-education certification or as a pre-med or pre-law degree.

Students are strongly encouraged to participate in undergraduate research opportunities. Many of these projects are highly interdisciplinary. Internships and study-abroad experiences can be arranged.

The department offers excellent computer facilities and a student machine shop.

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PSYCHOLOGY

Psychology is the study of human and animal behavior and the psychological, social, and biological processes related to that behavior. The curriculum emphasizes methods of conducting research and understanding behavioral data.

The program provides a strong,

broad-based education. Students study all aspects of psychology and, through research, can pursue an area of interest such as clinical, counseling, developmental, experimental, industrial-organizational, physiological, or social psychology through their choice of courses.

Graduates receive a B.S. and are prepared for positions in community agencies, hospitals, rehabilitation centers, prisons, schools, industry, and government agencies. It is important to note, however, that a career as a professional psychologist requires graduate training.

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STATISTICS

Statistics is the applied science of making decisions from data. The curriculum emphasizes the use of probability modeling to design efficient data collection schemes and to extract the maximum information from resulting data, using

state-of-the-art computer software.

In addition to a solid set of courses in statistics, students take supporting courses in mathematics, computer science, and technical writing and are encouraged to pursue a minor in science-

oriented disciplines.

Graduates receive a B.S. in statistics and readily find employment in business, industry, and government agencies, and are also well-prepared to begin graduate school.

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Find all this information and more, including course catalogs, at: <http://www.vt.edu>



SCIENCE

College & Career Opportunities

FRESHMAN CURRICULUM

Courses of study will vary. The flexibility of the majors in the College of Science enables students to tailor their curriculum to fit career goals and interests. All students must fulfill the Curriculum for Liberal Education requirements. Electives will be determined by the major selected. A typical first-year schedule follows:

1ST SEMESTER

English
Math
Science + lab
Two limited electives

2ND SEMESTER

English
Math
Science + lab
Two limited electives

HONORS, CO-OP, & EDUCATION ABROAD

University Honors is available to students who have either a cumulative GPA of 3.80 (as reported on the high school transcript) and a minimum SAT score of 1350 (critical reading and mathematics) or a minimum ACT composite score of 30. Current college students who have a 3.6 or higher GPA are also

eligible for University Honors. For more information, visit www.unihonors.vt.edu.

Qualified students may wish to participate in the **Cooperative Education Program**. Co-op is a five-year program alternating academic semesters with related work semesters. This program allows students to help finance

their education while gaining valuable experience in their chosen fields. Students can learn more about co-op opportunities at www.career.vt.edu.

Qualified juniors and seniors can participate in **Education Abroad Programs** around the world. Find out more at www.oired.vt.edu.

STUDENT ORGANIZATIONS

In addition to the wide variety of clubs and special-interest groups available at Virginia Tech, the following curricular activities are open to science students:

- » American Chemical Soc.—student affiliates
- » Association of Black Psychologists
- » Biochemistry Club
- » Biology Club
- » Geology Club
- » Geophysical Society at Virginia Tech
- » Math Club
- » Microbiology Club
- » Minority Assoc. of Pre-Health Students
- » Psychology Club
- » Society of Physics Students
- » Statistics Club

- » VABIO—Virginia Biotechnology Association
- » W.B. Alwood Entomological Society

Honor societies include:

- » Alpha Chi Sigma—chemistry
- » Alpha Epsilon Delta—pre-med
- » Mu Sigma Rho—statistics
- » Phi Sigma
- » Pi Mu Epsilon—math
- » Psi Chi—psychology
- » Sigma Gamma Epsilon—earth sciences

Contact Us

For more information about the College of Science, please contact:

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If you have questions about admission to Virginia Tech, please contact:

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INSIDE LOOK:

Career Opportunities

The demand for graduates who have a liberal arts background from a university with a solid academic reputation is increasing. Employers find this background attractive because it often indicates an individual with strong interpersonal skills, effective written and oral communication skills, and the ability to analyze situations and solve problems effectively. The flexibility of the programs allows students to pursue specific career goals within the context of a broad education.

A partial list of career opportunities follows. More information is available from Career Services at www.career.vt.edu.

- » Actuary
- » Applied physicist
- » Biostatistician
- » Biotechnologist
- » Chemical physicist
- » Clinical chemist
- » Dentist
- » Economist
- » Economic statistician
- » Field assistant
- » Industrial hygienist
- » Laboratory manager
- » Laboratory technician
- » Mathematical physicist
- » Medical researcher
- » Medical technologist
- » Molecular biologist
- » National security agent
- » Nutritionist
- » Park naturalist
- » Pharmaceutical chemist
- » Physical therapist
- » Physician
- » Physicist
- » Psychologist
- » Quality controller
- » Research and development scientist
- » Research technician
- » Sales representative
- » Scientific applications programmer
- » Space physicist
- » Stock market researcher
- » Survey planner and analyst
- » Teacher
- » Technical sales representative
- » Veterinarian
- » Zoo assistant