

## College of Science and Mathematics

Dean and Professor of Chemistry Michael McGinnis

The College of Science and Mathematics is comprised of the Departments of Biology and Physical Education; Chemistry and Biochemistry; Earth and Environmental Science; Mathematics; Physics; and Sports Medicine. Each department has its own chair.

### Mission

The mission of the College of Science and Mathematics is to provide high quality academic degree programs in mathematics and in the physical, biological and life sciences for our majors. We also provide support courses in these areas to meet the needs of the University. To this end we will provide the knowledge, experience and guidance in mathematics and the sciences in lecture, laboratory, and clinical settings that prepare our students to pursue advanced study, successful careers, and to become responsible citizens in a democratic society.

### Department of Biology & Physical Education

Department Chair: Professor Scott Page

Department Chair: Associate Professor Scott Page

Physical Education Program Coordinator: Associate Professor Elizabeth Wuorinen

Biology and Physical Education curricula offer students the opportunity to study the structure and function of living systems, from the complexity of cellular components to whole organism dynamics to ecosystem design.

The Bachelor of Science in Biology (<http://catalog.norwich.edu/archives/2014-15/residentialprograms/catalog/collegeofscienceandmathematics/biology>) prepares students for admission into graduate, medical, optometry, dentistry, and veterinary medical schools, as well as for immediate employment in the areas of environmental science, biotechnology, and teaching. Recent graduates are engaged in all of these areas. A core curriculum of science, mathematics and English courses ensures development of appropriate analytical and communication skills. Rounding out the major, seven free biology electives and 10 totally free electives allow students to mold their programs to meet specific career goals and develop one or more minors and/or double majors. A special Pre-medical Committee oversees our Pre-medical/Pre-dental track and assists in the placement of our graduates. Students who major in Biology may also elect a concentration in Neuroscience (<http://catalog.norwich.edu/archives/2014-15/residentialprograms/catalog/collegeofscienceandmathematics/neuroscience>).

A degree in Physical Education (<http://catalog.norwich.edu/archives/2014-15/residentialprograms/catalog/collegeofscienceandmathematics/physicaleducation>) emphasizes principles, problems and procedures for the improvement of individual and community health. The program provides an introduction to the Physical Education profession, and includes historical and philosophical implications and modern trends in program design with an emphasis on the study of the human body. Professional ethics, client privacy and liability issues are stressed throughout the program. Our students learn to design, revise and analyze exercise programs, how to coach team sports and group activities, and how to identify and implement exercise programs for a range of individuals, from athletes to disabled people.

The Physical Education students have access to the facilities and equipment of the Department of Biology and Physical Education. There are various courses designed to develop the students' interest in both

pedagogy and the fitness related fields. The Physical Education Major offers two options, Teacher Education and Exercise Science:

The courses in the Teacher Education option are designed to prepare students for teaching Physical Education in both elementary and secondary schools. The Teacher Education option is committed to a standards-based approach in the development of beginning educators.

The courses in the Exercise Science option are designed to prepare the student for nationally recognized certifications, such as the American College of Sports Medicine (ACSM) and National Strength and Conditioning Association (NSCA). There are courses available to engage the student in practical experiences in a range of venues from outdoor education to fitness facilities, as well as research opportunities.

An undergraduate degree in Physical Education Exercise Science option may also serve toward continued education in graduate school in exercise physiology or related area. Students also enter specialized programs leading to careers in strength and conditioning, outdoor leadership, recreation, cardiac or pulmonary rehabilitation, nutrition, and clinical research.

### Department of Chemistry & Biochemistry

Department Chair: Professor Mary Hoppe

Shinquin Programs of Chemistry and Biochemistry

Professors J. Byrne, Hoppe (Chair) and McGinnis; Associate Professors Rizzolo, Blank and Frisbie; Assistant Professor Guth; Lecturers Milius, Hoeltge, and Rutkowski

The Bachelor of Science in Chemistry and the Bachelor of Science in Biochemistry (<http://catalog.norwich.edu/archives/2014-15/residentialprograms/catalog/collegeofscienceandmathematics/chemistryandbiochemistry>) offer thorough and hands on laboratory oriented curricula. Our graduates are highly desired by industry and government employers for their laboratory skills, as well as being well qualified for admission to graduate and professional schools. The courses and labs required for these degrees assure that graduates are proficient in the fundamental principles of chemistry and prepared to apply these principles to specialized areas such as environmental, forensic, medicinal, and pharmaceutical chemistry.

Attainment of the Bachelor of Science in Chemistry requires at least 122 credits as does the Bachelor of Science in Biochemistry. Course work should conform to the following tables since many advanced chemistry courses have other course as prerequisites. All courses listed on the curriculum map are required, although the sequence varies somewhat for courses offered in alternate years. It is difficult for chemistry and biochemistry majors to schedule the required courses unless they follow the outline recommended here and pay special attention to the alternate year courses (designated with a symbol §).

The progress of all student majoring in chemistry and biochemistry will be evaluated by the department at the end of the first and second years. Students receiving an unsatisfactory evaluation will be requested to change majors.

In addition to offering a rigorous, quality curriculum in chemistry and biochemistry, the faculty are committed to providing quality instruction in our introductory course. All of our 100 level courses are consistent with the General Education Goals of the University. These courses provide the student with an introduction to the scientific methods, the correct and the effective presentation of data, and develop the students' critical thinking skills by allowing the analysis and the interpretation of experimental data.

*Chemistry courses taken for 3 credits, without a laboratory, will only satisfy free elective or chemistry minor requirements. Chemistry and biochemistry majors must enroll in the 4 credit option of each course required by their major.*

## Department of Earth & Environmental Science

Department Chair: Charles A. Dana Professor Richard Dunn

Norwich University, in the middle of the Green Mountain State, is ideally situated for direct and field intensive studies of our natural environment. The Bachelor of Science in Geology degree program (<http://catalog.norwich.edu/archives/2014-15/residentialprogramscatalog/collegeofscienceandmathematics/geology>) is designed to take advantage of our physical location. Courses are presented by faculty who are both respected teachers and active researchers in New England, Europe, and the western U.S.

The Geology degree provides a broad background in the physical sciences with a strong focus on geology and its pivotal role in understanding our environment. In addition, students often use free electives to develop an additional specialization. Graduates in Geology are prepared for a variety of possible careers in industry, consulting, state and federal surveys, the military, and teaching, or to enter graduate school.

The program emphasizes experiential learning through field studies and outdoor education. Courses include real projects and original research participation. The program is enriched through department field trips across New England, eastern Canada, and the western United States. All Geology majors take a pair of capstone courses involving an original research project and a seminar designed to synthesize their education and tie scientific thought to issues in society.

The department is equipped for analysis of ground and surface water, soil, sediment, and rock. Equipment enables terrestrial and lake coring, collection of hydro-geochemical data, determination of sediment characteristics, subsurface studies, geological mapping, and more.

Students in the Environmental Science degree program (<http://catalog.norwich.edu/archives/2014-15/residentialprogramscatalog/collegeofscienceandmathematics/geologyandenvironmentalscience>) take full advantage of Norwich University's location in the middle of the Green Mountain State, where we are ideally situated for field studies of our natural environment. The Bachelor of Science in Environmental Science is an interdisciplinary degree for students with environmental interests and career goals. Environmental Science majors start their curriculum with the development of a firm base in the sciences and mathematics. Each student develops an area of specialization by selecting a Concentration from one of two Options. Selection of an Option I Concentration leads to a heavier emphasis in science and engineering, whereas selection of an Option II Concentration results in a stronger emphasis in the social sciences, humanities and business.

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The Department of Earth and Environmental Sciences is equipped for analysis of ground and surface water, soil, sediment, and rock. Equipment enables terrestrial and lake coring, collection of hydro-geochemical data, determination of sediment characteristics, subsurface

studies, and more. In addition, majors have access to facilities in their departments of Concentration.

The ten selected Environmental Science Concentrations provide an education that is rigorous and makes graduates widely marketable within industry, graduate education, and the military.

## Department of Mathematics

Department Chair: Professor Robert Poodiack

The Mathematics Department offers a four-year program leading to the Bachelor of Science degree in Mathematics (<http://catalog.norwich.edu/archives/2014-15/residentialprogramscatalog/collegeofscienceandmathematics/mathematics>). The courses offered are intended to:

- prepare mathematics majors for graduate work in mathematics or careers in computer science, engineering, industry, business, actuary science, or teaching;
- support the curricula in all disciplines, and
- supply the students with the mathematics courses necessary to qualify for teacher licensure.

## Department of Physics

Department Chair: Associate Professor Richard Hyde

Norwich University offers the Bachelor of Science in Physics (<http://catalog.norwich.edu/archives/2014-15/residentialprogramscatalog/collegeofscienceandmathematics/physics>) to students desiring a strong background in basic physics. This curriculum prepares students for work in industry and government, for graduate work in physics and other physical sciences, or for a military career.

## Department of Sports Medicine

Department Chair: Associate Professor Eduardo Hernandez  
Athletic Training Program Coordinator: Lecturer James Murdock

The Bachelor of Science in Athletic Training (<http://catalog.norwich.edu/archives/2014-15/residentialprogramscatalog/collegeofscienceandmathematics/athletictrainingandsportsmedicine>) uses a competency-based approach in both the classroom and clinical settings. Using a medical education model, athletic training students gain experience in a variety of educational domains to prepare them to serve as allied health care providers for the physically active population. Certified Athletic Trainers have specialized education in the prevention, evaluation, diagnosis, and treatment of injuries and illness affecting physically active populations. Educational content is based on cognitive (knowledge), psycho-motor (skills), and clinical proficiencies (professional, practice-oriented outcomes). The Athletic Training Education Program (ATEP) incorporates hands-on experience in various professional settings. The Athletic Training Education Program (NU-ATEP) is accredited by the Commission on the Accreditation of Athletic Training Education (CAATE). Graduates are eligible to sit for the National Athletic Trainers' Association (NATA) Board of Certification (BOC) examination.

The Health Sciences program (<http://catalog.norwich.edu/archives/2014-15/residentialprogramscatalog/collegeofscienceandmathematics/sportsmedicine>) provides students an in-depth science background, and an introduction to the health care field. A core curriculum through freshman and sophomore years provides the students with a sound understanding of liberal arts, biology, chemistry, mathematics, physics, assessment, care and prevention.

The Health Science program incorporates hands-on experience in professional settings, with opportunities for internships and other community based learning. The Health Sciences program prepares students to meet the entrance requirements of graduate programs in areas such as physical therapy, occupational therapy, physician's assistant, medicine, public health, exercise sciences, biomechanics, and hospital administration.