

**B.S. BIOCHEMISTRY - CHEMICAL TRACK**

The State University of New York at Fredonia is committed to doing our part to provide each student a clear path to graduation. This four-year degree plan is a sample map for fulfilling requirements in the major, the College Core Curriculum (CCC), and other supporting courses. The pathway that you take to your degree may differ somewhat from this illustration, depending on where you start and the detours and side trips you may take along the way. If you are committed to completing your degree in four years, we encourage you to consider signing up for the Fredonia in 4 program. For complete information about this degree program, please consult the university catalog at [fredonia.smartcatalogiq.com](http://fredonia.smartcatalogiq.com)

FIRST YEAR					
Fall Semester			Spring Semester		
Course		Credits	Course		Credits
BIOL 131	Introductory Ecology & Evolution	3	BIOL 133	Introductory Cell & Molecular Biology	3
BIOL 132	Introductory Ecology & Evolution Lab	1	BIOL 134	Introductory Cell & Molecular Biology Lab	1
CHEM 115	General Chemistry I	3	CHEM 116	General Chemistry II	3
CHEM 125	General Chemistry Lab I	1	CHEM 126	General Chemistry Lab II	1
MATH 122	University Calculus I	4	MATH 123	University Calculus II	4
ENGL 100	English Composition	3	PHYS 230	University Physics I	3
CHEM 100	Chemistry Freshman Seminar	1	PHYS 232	University Physics Lab I	1
		<b>TOTAL</b>			<b>TOTAL</b>
		<b>16</b>			<b>16</b>

**Biochemistry**  
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**The State University**  
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SECOND YEAR					
Fall Semester			Spring Semester		
Course		Credits	Course		Credits
CHEM 215	Organic Chemistry I	3	CHEM 216	Organic Chemistry II	3
CHEM 225	Organic Chemistry Lab I	1	CHEM 230	Advanced Organic Lab	1
PHYS 231	University Physics II	3	CHEM 317	Analytical Chemistry, Quantitative Analysis	3
PHYS 233	University Physics Lab II	1	CHEM 327	Analytical Chemistry Lab I	1
BIOL 237	Genetics	3	CCC	American History	3
BIOL 238	Genetics Lab	1	CCC	Social Science	3
CCC	Humanities	3			
		<b>TOTAL</b>			<b>TOTAL</b>
		<b>15</b>			<b>14</b>

**The B.S. Biochemistry - Chemical Track** degree is among the most comprehensive in the northeast. With its core emphasis on mastery of technical and analytical skills in biochemistry, our program is designed to prepare students for graduate school, medical school, or careers in biochemical research. It also provides a broad foundation in the liberal arts, enhancing our graduates' abilities to meet challenges in a shifting social climate.

THIRD YEAR					
Fall Semester			Spring Semester		
Course		Credits	Course		Credits
BIOL 333	Biochemistry	3	CHEM 475	Advanced Biochemistry	3
BIOL 334	Biochemistry Lab	1	CHEM 136	Advanced Physical Chemistry	3
CHEM 315	Introduction to Physical Chemistry	3	CHEM 326	Advanced Physical Chemistry Lab	1
CHEM 325	Introduction to Physical Chemistry Lab	1	CHEM 465	Advanced Experimental Biochem. Lab	2
CCC	Western Civilization	3	CCC	Other World Civilizations	3
CCC	Foreign Language	3	CCC	Social Science	3
CCC	Art	3			
		<b>TOTAL</b>			<b>TOTAL</b>
		<b>17</b>			<b>15</b>

FOURTH YEAR					
Fall Semester			Spring Semester		
Course		Credits	Course		Credits
	BIOCHEM Major Elective	3	BIOL 380	Cell and Molecular Biology	3
	General Elective	3	CHEM 496	Seminar: Advances in Chemistry	1
	General Elective	3		General Elective	3
	BIOCHEM Major Elective	3		BIOCHEM Major Elective	3
	BIOCHEM Major Elective	3		General Elective	3
CHEM 495	Seminar: Advances in Chemistry	1			
		<b>TOTAL</b>			<b>TOTAL</b>
		<b>16</b>			<b>13</b>
		<b>2016-2017</b>			<b>GRAND TOTAL</b>
					<b>122</b>

[fredonia.edu](http://fredonia.edu)

## Why Study the Natural Sciences at Fredonia?

The Natural Sciences at Fredonia encompass state of the art programs in pure and applied sciences that prepare you well for graduate school and professional careers. Each program gives you the opportunity to engage in meaningful research in collaboration with the faculty.

### Choose from a variety of disciplines

- Mathematical Sciences offer programs in pure and applied mathematics, as well as certification programs in mathematics education.
- Computer and Information Sciences have multiple programs including those in software development, systems management and cooperative computer engineering.
- Biology houses programs in Biology, Medical Technology, Molecular Genetics, Exercise Science and Biology Adolescence Education.
- The Department of Chemistry and Biochemistry offers programs approved by the premier accreditor, The American Chemical Society, as well as certification program in Adolescence Chemistry Education.



- Programs in the Physics Department include several concentrations in Physics (including Physics Education), as well as being the home for most Cooperative Engineering majors.
- Programs in Geology and Environmental Sciences cover all aspects of earth and planetary sciences as well as the interdisciplinary programs in environmental science and GIS.

### Thrive in state-of-the-art Science Center

- Our new \$60 million Science Center features \$5 million in cutting-edge instruments and equipment. It boasts an innovative design that maximizes student learning, facilitates student-faculty collaboration, and creates spontaneous interactions across disciplines.
- Research labs and classrooms incorporate glass walls, natural light and open spaces, allowing visitors to easily observe students and faculty learning together.

### Receive an exceptional value

- Fredonia alumni in graduate and medical schools consistently say they were better prepared than their peers at larger schools because of rigorous Fredonia courses, smaller class sizes, undergraduate research opportunities and genuine relationships with faculty mentors.
- Internships are conducted in hospital labs, physician offices, health departments, environmental agencies, and energy, biomedical and pharmaceutical companies, as well as hospitals, pharmacies, veterinary clinics and zoos.
- Health Professions Advising Program assists students pursuing careers in medicine, dentistry, optometry and veterinary medicine.
- Students perform field research in Lake Erie, its tributaries and Fredonia's 200-acre nature sanctuary.

- Numerous need- and merit-based scholarships and fellowships are available for academically talented students, including some of the biggest awards available on campus.

### Exceptional faculty

- Faculty conduct research and are recognized consistently for their efforts on local, regional, national and international levels.
- Their interests range from studying the animal behavior of bats and praying mantises, among other species, quantifying the potential natural gas held with the Marcellus Shale region, and improving the water quality of the Great Lakes.



- One professor's research spurred a national law signed by President Obama. It bans the use of plastic microbeads in beauty and exfoliating products — because a Fredonian showed they contaminate water systems.

### Alumni successes

- Many recent graduates are enrolled in medical, dental, veterinary and optometry schools.
- Alumni have gone on to become clinical scientists, high school teachers, biomedical research scientists, physicians, pharmacists, environmental scientists, venture capitalists, veterinarians, lab directors, lawyers and forensic scientists, among other professions.
- Fredonians are among the faculty at University of California at Berkeley, Penn State University, Indiana University of Pennsylvania, The Scripps Research Institute and other institutions.