DEPARTMENT OF BIOLOGY

FREDONIA

STATE UNIVERSITY OF NEW YORK

Undergraduate Student Handbook

Academic Year 2018- 2019

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Introduction

Welcome to the Biology Department The State University of New York at Fredonia!

The purpose of this Handbook is to help you gain as much as possible from your experiences in the Department of Biology at Fredonia. You will find information about our programs, opportunities, services and procedures. This Handbook supplements, but does not replace the Fredonia Catalogue.

Department Mission Statement

The mission of the Biology Department at Fredonia is to provide excellent instruction in all areas of Biological Science from molecules to ecosystems. Through rigorous student centered programs of study, we aspire to produce graduates who are well-prepared to enter graduate and professional programs and a wide variety of career opportunities. Through our contribution to general education, we strive to bring to the broader community of students, a greater understanding of the natural world and the process of scientific thinking. As a part of the scientific community, the Department values faculty scholarship, not only for the creation of new knowledge, but also as a means to better inform our faculty teaching and to provide meaningful opportunities for collaboration with students in the practice of science. We recognize our important role within the University and region, and in promoting scientific literacy and understanding in the wider community.

Student Learning Outcomes

The Biology Department has three primary Student Learning Outcomes (SLO), and assesses student ability in these areas:

SLO 1: Majors in the Biology Department should be able to communicate scientific observations, analyses, and arguments and to critically evaluate the scientific merit of articles and/or lectures.

SLO 2: Majors in the Biology Department should possess a solid comprehension of basic principles in the biological sciences, the nature of science, and the basis of scientific laws and theories.

SLO 3: Majors in the Biology Department should be able to design experiments, and collect, analyze, and interpret data.

Overview of Undergraduate Programs in the Biology Department

Biology
The Biology program is a comprehensive major requiring course in molecular biology, cell biology, organismal biology and ecology. Students are also required to perform a capstone research, internship or course experience. This program is recommended for students interested in pursuing graduate work in the biological sciences or professional studies in the health sciences. Additional information can be found in the catalog and webpage. https://www.fredonia.edu/biology/biology

Biology Adolescence Education
The science requirements for this major are very similar to those for the Biology major. Education courses are also required to obtain initial teaching certification in NYS. This program is recommended for students who wish to teach biology at the high school and middle school level. Additional information can be found in the catalog and webpage. https://www.fredonia.edu/biology/adolescence

Exercise Science
The Exercise Science program focuses on applied human physiology. This program is recommended for students interested in pursuing careers in Physical Therapy, Occupational Therapy, Chiropractic and Health and Wellness Promotion. The Exercise Science Program would also serve students considering graduate school programs focused on human physiology, exercise physiology and biomechanics (Exercise Science Track). Additional information can be found in the catalog and webpage.
https://www.fredonia.edu/biology/exercisescience

Medical Technology
The Medical Technology major is a professional program recommended for students interested in pursuing careers in clinical laboratory medicine. Students spend three years on campus at Fredonia and the final year interning at an accredited hospital program; application for internships is competitive. The program is certified for licensure through the NYS department of education and meets the requirements set forth by the National Accrediting Agency for Clinical Laboratory Sciences. Additional information can be found in the catalog and webpage. https://www.fredonia.edu/biology/medtech

Molecular Genetics
The Molecular Genetics program provides students with an intensive introduction to molecular and cellular biology and genetics. This program is recommended for students interested in pursuing graduate work in molecular biology, or in entering the work field as research technicians. Additional information can be found in the catalog and webpage. https://www.fredonia.edu/biology/molgen

Course Sequence Sheets and Checklists for Biology Programs

(Please double click on the page to view in a PDF file)

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A TYPICAL COURSE OF STUDY FOR A

BIOLOGY MAJOR

(Curriculum Code Number: 0313)

Outlined below is a typical four-year program for a Biology major at Fredonia. There is considerable flexibility, so your actual program may differ. The keys to graduating on time (the 4-year plan) are: 1) to select a major within your first academic year; 2) complete an average of 15 new credit hours each semester; 3) pass all of your courses and maintain a minimum 2.00 GPA overall and in the major (required); 4) keep your Biology and Chemistry sequence "on track"; and 5) work with your advisor to discuss your progress toward the four-year degree. The proposed course load attempts to present the required courses as early as possible so that one may have a very flexible senior year, which should allow you to become more involved in electives offered in your major. Some of the Biology electives, usually taken in the junior and senior years, are listed on the reverse side of this page. Remember, there is some flexibility, so your actual program may differ somewhat.

FRESHMAN YEAR -- FALL			FRESHMAN YEAR -- SPRING		
Cr. Hrs.	Course Number	Course Title	Cr. Hrs.	Course Number	Course Title
1	BIOL 100	Studying for Success (Highly Recommended)	4	BIOL 133/134	Intro Cell & Molecular Biology Lecture & Lab
4	BIOL 131/132	Intro Ecology & Evolution Lecture & Lab	4	CHEM 116/126	General Chemistry II Lecture & Lab
4	CHEM 115/125	General Chemistry I Lecture & Lab *(FF: Nat. Sci.)*	3-4	STAT 250	Stat for Scientists *(FF: Math/Quant)* **OR**
3	FF:	Social Sciences		MATH 120/122	Survey of Calculus I **OR** University Calculus I
3	FF:	Written Communication	3	FF:	Foreign Language
15	credit hours		14-15	credit hours	*(subtotal = 29-30 credits)*
SOPHOMORE YEAR -- FALL			**SOPHOMORE -- SPRING**		
4	BIOL 237/238	Genetics Lecture & Lab	4	BIOL 243/244	Organismal BiologyLecture & Lab
4	CHEM 215/225	Organic Chemistry I Lecture & Lab	4	CHEM 216/226	Organic Chemistry II Lecture & Lab
3	Elective	Any field of study†	3	Elective	Any field of study†
3	FF:	Arts	2	Elective	Any field of study†
			3	FF:	Humanities
14	credit hours	(subtotal = 43-44 credits)	16	credit hours	(subtotal = 59-60 credits)
JUNIOR YEAR -- FALL			**JUNIOR YEAR -- SPRING**		
4	BIOL 330/331	Ecology Lecture & Lab	3	BIOL	Elective (300- or 400-level)
4	BIOL 333/334	Biochemistry Lecture & Lab	4	PHYS 122/124	Physics II Lecture & Lab
4	PHYS 121/123	Physics I Lecture & Lab (CCC: Nat. Sci.)	3	Elective	Any field of study†
3	FF:	American History or Western Civilization or Other world Civilizations*	3	FF:	American History / Western Civilization / Other World Civilizations*
15	credit hours	(subtotal = 74-75 credits)	3	Elective	Any field of study
			16	credit hours	(subtotal = 90-91 credits)
SENIOR YEAR -- FALL			**SENIOR YEAR -- SPRING**		
3	BIOL	Elective (300 or 400 Level)	3	BIOL	Elective (300 or 400 level)
3	BIOL	Elective (300 or 400 level)	3	Elective	Any field of study† (300-400) level)
3	BIOL 491, 492	Senior Capstone (Research, Internship or Course) ††	3	Elective	Any field of study† (300-400) level)
3	Elective	Any field of study†	3	Elective	Any field of study†
3	Elective	Any field of study†	3	FF:	Any field of study†
15	credit hours	(subtotal = 105-106 credits)	15	cr. hrs.	(subtotal = 120 credits)

TOTAL MINIMUM HOURS REQUIRED: 120 hrs, 45 hours must be upper level

Notes:	
†	Electives can be from any field of study; students are strongly encouraged to consider completing a minor.
††	Senior Capstone must be taken during the senior year; specific time and length of time will vary based upon the experience. Capstone Experience fulfills the FF Oral Communication category.
*	Students must take 2 of the following: American History / Western Civilization / Other World Civilizations.

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State University of New York at Fredonia, Fredonia, NY 14063

Curriculum Checklist: B.S. Degree in BIOLOGY

(Curriculum Code Number: 0313)

GROUP I: FREDONIA FOUNDATIONS -- On the back of this sheet. **(21 hrs)**

† *Please note that 9 of the 30 hours are Required Courses listed below.*

GROUP II: REQUIREMENTS FOR MAJOR IN BIOLOGY -- **(27 hrs)**

Students must maintain a minimum 2.00 GPA overall and in the major.

	COURSE NUMBER AND TITLE			CR. HRS	SEMESTER COMPLETED F / S - YEAR	GRADE	Q. Pts.
	BIOL 131	Intro Ecology & Evolution Lecture		3	F		
	BIOL 132	Intro Ecology & Evolution Lab		1	F		
	BIOL 133	Intro Cell & Molecular Biology Lectur		3	S		
	BIOL 134	Intro Cell & Molecular Biology Lab		1	S		
*	BIOL 237	Genetics Lecture		3	F		
*	BIOL 238	Genetics Lab		1	F		
*	BIOL 243	Organismal Biology		3	S		
*	BIOL 244	Organismal Biology Lab		1	S		
*	BIOL 330	Ecology Lecture		3	F		
*	BIOL 331	Ecology Lab		1	F		
*	BIOL 333	Biochemistry Lecture		3	F		
*	BIOL 334	Biochemistry Lab		1	F		
†*	BIOL 491	Senior Capstone - Research	OR	3	F/S		
†*	BIOL 492	Senior Capstone - Internship	OR	3	F/S		
†*	BIOL 493	Senior Capstone - Course		3	F/S		

*** GROUP III: BIOLOGY ELECTIVES** **(12 hrs)**

Majors must take one upper level course from each of the three major biological sub-disciplines: Cell/Molecular, Organismal, Ecology/Evolution. A student whose capstone experience does not have a significant lab or field based component will be required to take a sub-discipline course that provides this opportunity. The remaining elective credits will be taken from upper level Biology courses, upon advisement.

	COURSE NUMBER AND TITLE		*LAB or FIELD*	HRS	F / S - YEAR	GRADE	Q. Pts.
Cell/Molecular Elective	BIOL						
Organismal Elective	BIOL						
Ecology/Evolution Elective	BIOL						
BIOL							

GROUP IV: SUPPORTING COURSES **(27-29 hrs)**

	COURSE TITLE AND NUMBER		HRS	F/S-YEAR	GRADE		HRS	F/S-YEAR	GRADE
+	General Chemistry I Lecture & Lab	CHEM 115	3	F		CHEM 125	1	F	
	General Chemistry II Lecture & Lab	CHEM 116	3	S		CHEM 126	1	S	
*	Organic Chem I Lecture & Lab	CHEM 215	3	F		CHEM 225	1	F	
*	Organic Chem II Lecture & Lab	CHEM 216	3	S		CHEM 226	1	S	
		(Circle one)							
+	Statistics for Scientists	STAT 250	3	F S	*or* Survey of Calculus I MATH 120		3	F S	
					or University Calculus I MATH 122		4	F S	
	Physics I Lecture & Lab	PHYS I 121 *or* 230	3 or 4	F S		*and* PHYS I 123 *or* 232	1	F S	
	Physics II Lecture & Lab	PHYS II 122 *or* 231	3 or 4	F S		*and* PHYS II 124 *or* 233	1	F S	

GROUP V: ELECTIVES -- 6 credits must be UL. Maximum of 15 Biology credits. **(Minimum: 25-30 hrs)**

COURSE NUMBER AND TITLE	HRS	F / S - YEAR	GRADE	Q. Pts.
Upper Level				
Upper Level				

* 39 credits counting toward 45 UL hour requirement

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TOTAL *MINIMUM* HOURS REQUIRED: 120 hrs

Electives for the Biology Major
(Curriculum Code: 0313)

Biology majors are required to take 12 hours of upper level Biology electives. To ensure a comprehensive and well-rounded treatment of the biological sciences, you must take one course from each of the three sub-disciplines, below. These courses are offered annually or every other year, and you will select your electives in consultation with your advisor. You will need junior or senior standing for these courses (please check the College Catalog for pre-requisites). A student whose capstone experience does not have a significant lab or field based component will be required to take an Arena course that provides this opportunity (There are 9 such courses in the Arenas).

Sub-Disciplines / Arenas

Cell and Molecular

- Advanced Biochemistry
- Advanced Experimental Biochemistry
- Cancer Biology
- Cell and Molecular Biology (Lab)
- Cell Signaling
- Designer Genetics
- Developmental Biology (Lab)
- Developmental Neurobiology
- Immunology
- Microbiology (Lab)
- Molecular Biology of Disease
- Molecular Genetics Lab (Lab)
- Molecules and Medicine
- Neurobiology
- Structural Biology

Organismal

- Advanced Neurophysiology
- Animal Behavior
- Animal Communication
- Developmental Biology (Lab)
- Immunology
- Mammalian Physiology (Lab)
- Microbiology (Lab)
- Muscles and Movement
- Neurobiology
- Plant Taxonomy (Field)
- Vertebrate Anatomy (Lab)

Ecology / Evolution

- Animal Behavior
- Animal Communication
- Aquatic Biology
- Biological Conservation
- Evolution
- Global Climate Change
- Plant Taxonomy (Field)
- Sociobiology
- Tropical Islands (Field)
- Vertebrate Anatomy (Lab)

The remaining elective credits will be taken from upper level courses in the sub-disciplines (above), Biostatistics, Undergraduate Research (not including Capstone Research), Hematology, Parasitology, Lab Supervision and Museum Practicum.

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Department of Biology

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(716) 673 - 3282 -- www.fredonia.edu/biology/ -- Fax: (716) 673 - 3493

A TYPICAL COURSE OF STUDY FOR A BIOLOGY ADOLESCENCE EDUCATION MAJOR

Curriculum Code Number: 2127 -- BIOLOGY CERTIFICATION FOR GRADES 7 - 12

Outlined below is a typical program for a Biology Adolescence Education major at Fredonia--your program may not be identical. The only courses listed are those required for graduation. It does not include elective courses or other courses that might be recommended for a particular student. New York State certification requirements include a foreign language. Biology Adolescence Education has a large number of required courses and extreme care must be taken in preparing schedules to ensure completion in four years. KEYS to "on time" graduation: 1) Choose major within your freshman year; 2) earn a minimum 2.75 GPA (required); 3) keep your Biology and Chemistry sequence "on track"; and 4) work with your Academic Advisor to discuss your progress toward your four-year degree.

FRESHMAN YEAR -- FALL

Cr. Hrs.	Course Number	Course Title
1	BIOL 100	Studying for Success (Highly Recommended)
4	BIOL 131/132	Introductory Ecology and Evolution Lecture & Lab
4	CHEM 115/125	General Chemistry I Lecture & Lab *(FF: Nat. Sci.)*
3	STAT 250	Statistics for Scientists *(FF: Math/Quant.)*
3	FF:	Foreign Language* **(110 level)**
15	credit hours	

FRESHMAN YEAR -- SPRING

Cr. Hrs.	Course Number	Course Title
4	BIOL 133/134	Introductory Cell and Molecular Biology Lecture & Lab
4	CHEM 116/126	General Chemistry II Lecture & Lab
3	MAED/SCED 105/106	Nature of Science & Sci Education, & Field Exp.
3	FF:	Written Communication
14	credit hours	*(Subtotal = 29 credits)*

SOPHOMORE YEAR -- FALL

4	BIOL 237/238	Genetics Lecture & Lab
4	CHEM 215/225	Organic Chemistry I Lecture & Lab
3	EDU 224	Adolescent Development (FF-Social Sciences)
3	EDU 250/251	Intro. to the Exceptional Learner & Field Exp.
3	FF:	Humanities
17	credit hours	*(Subtotal = 46 credits)*

SOPHOMORE YEAR -- SPRING

4	BIOL 243/244	Organismal Biology Lecture & Lab
4	CHEM 216/226	Organic Chemistry II Lecture & Lab
3	MAED/SCED 276	Literacy & Technology for Science & Math
3	FF:	American History / Western Civilization / Other World
14	credit hours	*(Subtotal = 60 credits)*

JUNIOR YEAR -- FALL

4	BIOL 330/331	Ecology Lecture & Lab
4	BIOL 333/334	Biochemistry Lecture & Lab
3	EDU 349	Educational Psychology
4	PHYS 121/123	Physics I Lecture & Lab
15	credit hours	*(Subtotal = 75 credits)*

JUNIOR YEAR -- SPRING

3	BIOL	Elective (300-400 level)
4	PHYS 122/124	Physics II Lecture & Lab
3	SCED 305/313	Diversity in Teaching Sci & Math & Field Exp.
3	FF:	American History / Western Civilization / Other World Civilizations
3	FF:	Arts
16	credit hours	*(Subtotal - 91 credits)*

SENIOR YEAR -- FALL

3	BIOL 421	Biological Conservation
3	SCED 419	Adolescence Science Methods & Field Exp.
2	EDU 303/304	Safe Schools & Healthy Students
3	BIOL	Elective (300 or 400 level)
3	BIOL	Elective (300 or 400 level)
14	credit hours	*(Subtotal = 105 credits)*

SENIOR YEAR -- SPRING

15	EDU 430	Student Teaching in the Secondary School: Spring Semester Only (CCC-Basic Communication Oral)
3	SCED 303	Assessment for Inquiry-based Science
		Because Student Teaching occurs during the Spring Semester, all other requirements must be completed in 7 semesters.
18	credit hours	*(123 Total MINIMUM Hours Required, 45 hours must be upper level))*

Notes * **It is the student's responsibility to ensure that an official transcript listing completed languages is on file in the Biology Department Office.**

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The Department of Biology

State University of New York at Fredonia, Fredonia, NY 14063

Curriculum Checklist: B.S. Degree in BIOLOGY ADOLESCENCE EDUCATION

Curriculum Code Number: 2127 -- BIOLOGY CERTIFICATION FOR GRADES 7 - 12

GROUP I: FREDONIA FOUNDATIONS -- On the back of this sheet. (18 hrs)

**Please note that 12 of the 30 hours are Required Courses listed below.*

GROUP II: REQUIREMENTS FOR MAJOR IN BIOLOGY -- (27 hrs)

Students must maintain a minimum 2.75 GPA overall and in the major.

COURSE NUMBER AND TITLE		CR. HRS	SEMESTER COMPLETED F / S - YEAR	GRADE	Q. Pts.
BIOL 131	Introductory Ecology and Evolution Lecture	3	F		
BIOL 132	Introductory Ecology and Evolution Lab	1	F		
BIOL 133	Introductory Cell and Molecular Biology Lecture	3	S		
BIOL 134	Introductory Cell and Molecular Biology Lab	1	S		
BIOL 237	Genetics Lecture	3	F		
BIOL 238	Genetics Lab	1	F		
BIOL 243	Organismal Biology Lecture	3	S		
BIOL 244	Organismal Biology Lab	1	S		
BIOL 330	Ecology Lecture	3	F		
BIOL 331	Ecology Lab	1	F		
BIOL 333	Biochemistry Lecture	3	F		
BIOL 334	Biochemistry Lab	1	F		
BIOL 421	Biological Conservation	3	F		

BIOLOGY ELECTIVES - *Minimum 2.75 GPA* (9 hrs)

BIOL 300- 400- level courses. No more than 3 cr. hrs. of UG Research, Lab Supervision, Museum Practicum or Internship.

COURSE NUMBER AND TITLE	HRS	F / S - YEAR	GRADE	Q. Pts.
1. BIOL				
2. BIOL				
3. BIOL				

GROUP III: SUPPORTING COURSES -- (27-29 hrs)

COURSE TITLE AND NUMBER		HRS	F/S-YEAR	GRADE		HRS	F/S-YEAR	GRADE
* General Chemistry I Lecture & Lab	CHEM 115	3	F		CHEM 125	1	F	
General Chemistry II Lecture & Lab	CHEM 116	3	S		CHEM 126	1	S	
Organic Chemistry I Lecture & Lab	CHEM 215	3	F		CHEM 225	1	F	
Organic Chemistry II Lecture & Lab	CHEM 216	3	S		CHEM 226	1	S	
(Circle one)					*(Circle one)*			
* Statistics for Scientists	STAT 250	3	F S					
* Physics I Lecture & Lab	PHYS I 121 *or* 230	3 or 4	F S		*and* PHYS I 123 *or* 232	1	F S	
Physics II Lecture & Lab	PHYS II 122 *or* 231	3 or 4	F S		*and* PHYS II 124 *or* 233	1	F S	

GROUP IV: ADOLESCENCE EDUCATION -- *Minimum 2.75 GPA Required* (41 hrs)

	COURSE NUMBER AND TITLE	HRS	F / S - YEAR	GRADE	Q. Pts.
MAED/ SCED	105/106 Nature of Science and Science Education, & Field Exp.	3			
EDU	224 Adolescent Development	3			
EDU	250/251 Introduction to the Exceptional Learner & Field Exp.	3			
MAED/SCED	276 Literacy and Technology for Science and Mathematics	3			
EDU	303 SAVE/DASA/FIRE&ARSON	1			
EDU	304 Safe Schools and Healthy Students	1			
SCED	303 Assessment for Inquiry-Based Science	3			
SCED	305/313 Diversity in the Teaching of Science and Math & Field Exp.	3			
EDU	349 Educational Psychology	3			
SCED	419 Adolescence Science Methods & Field Exp.	3			
EDU	430 Student Teaching in the Secondary School Spring Semester Only	15			

NOTES: Because Student Teaching occurs during the Spring Semester, all other requirements must be completed in 7 semesters.

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TOTAL MINIMUM HOURS REQUIRED: 122 HRS - 45 hours must be upper level

Electives for the Biology Adolescence Education Major

(Curriculum Code Number: 2127)

The list below includes many of the courses that are considered upper level electives for the Biology or Biology Adolescence Education degrees. Most of these courses are offered on a yearly or every other year basis. In most cases, you will need junior standing to be eligible for these courses (check the College Catalog for prerequisites). If you are interested in any of these electives, please check the most recent Course Offerings Online. Adolescence Education majors generally have little free time for electives, so careful planning with the assistance of your Academic Advisor is important.

Advanced Biochemistry
Advanced Experimental Biochemistry
Advanced Neurophysiology
Animal Behavior
Animal Communication
Aquatic Biology
Basic Hematology
Biostatistics
Cancer Biology
Cell and Molecular Biology
Cell Signaling
Designer Genetics
Developmental Biology
Developmental Neurobiology
Evolution
Global Climate Change
Immunology
Mammalian Physiology
Microbiology
Molecular Biology of Disease
Molecular Genetics Lab
Molecules and Medicine
Muscles and Movement
Museum Practicum
Neurobiology
Parasitology
Plant Taxonomy
Sociobiology
Tropical Islands
Undergraduate Research
Vertebrate Anatomy

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A TYPICAL COURSE OF STUDY FOR A
EXERCISE SCIENCE MAJOR

(Curriculum Code Number: 0423)

Outlined below is a typical four-year program for an Exercise Science major at Fredonia. There is some flexibility, so your actual program may differ. The keys to graduating on time (the 4-year plan) are: 1) to select a major within your first academic year; 2) complete an average of 15 new credit hours each semester; 3) pass all of your courses and maintain a minimum 2.00 GPA overall and in the major (required); 4) keep your pre-requisite courses "on track"; and 5) work with your advisor to discuss your progress toward the four-year degree. The proposed course load attempts to present the required courses as early as possible so that one may have a very flexible senior year, which should allow you to focus on your major courses and capstone.

FRESHMAN YEAR -- FALL

Cr. Hrs.	Course Number	Course Title
1	BIOL 100	Studying for Success (Highly Recommended)
4	BIOL 131/132	Intro Ecology & Evolution Lecture & Lab
4	CHEM 115/125	General Chemistry I Lecture & Lab (FF: Nat. Sc:
3	*FF:*	*Written Communication*
3	*FF:*	*American History***
15	credit hours	

FRESHMAN YEAR -- SPRING

Cr. Hrs.	Course Number	Course Title
4	BIOL 133/134	Intro Cell & Mol Biol Lecture & Lab
4	CHEM 116/126	General Chemistry II Lecture & Lab
3	STAT 250	Statistics for Scientists (FF: Math/Quant)
3	*FF:*	*Foreign Language*
14	credit hours	*(subtotal = 29 credits)*

SOPHOMORE YEAR -- FALL

1	EXSC 250	Introduction to Applied Human Physiology
4	BIOL 245	Human Anatomy & Physiology I Lecture & Lab
4	PHYS 121/123	College Physics I Lecture & Lab
3	PSY 129	Intro to Psych *(FF: Social Science)*
3	*FF:*	*Humanities*
15	credit hours	*(subtotal = 44 credits)*

SOPHOMORE YEAR -- SPRING

4	BIOL 246	Human Anatomy & Physiology II Lect & Lab
3	BIOL 220	Principles of Human Nutrition
4	PHYS 122/124	College Physics II Lecture & Lab
3	*FF:*	*Humanities*
14	credit hours	*(subtotal = 58 credits)*

JUNIOR YEAR -- FALL

4	EXSC 300	Exercise Physiology Lecture & Lab
3	PSY XXX	Second Psychology Course
3	*FF:*	*American History or Western Civilizations or Other World Civilizations**
3	Elective	Any field of study†
3	Elective	Any field of study†
16	credit hours	*(subtotal = 74 credits)*

JUNIOR YEAR -- SPRING

3	EXSC 350	Kinesiology
3	EXSC 302	Exercise Prescription
3	*FF:*	*American History or Western Civilizations or Other World Civilizations**
3	Elective	Any field of study† (300-400 level)
3	Elective	Any field of study†
15	credit hours	*(subtotal = 89 credits)*

SENIOR YEAR -- FALL

3	EXSC 491, 492 or 493	Capstone Experience (Research, Internship, or Course) †† (FF Oral Communication)
3	EXSC 425	Biomechanics
3	EXSC/BIOL	Upper Level Elective
3	EXSC/BIOL	Upper Level Elective
3	*Elective*	Any field of study†
15	credit hours	*(subtotal = 104 credits)*

SENIOR YEAR -- SPRING

3	EXSC/BIOL	Upper Level Elective
3	Elective	Any field of study† (300-400 level)
3	Elective	Any field of study† (300-400 level)
3	Elective	Any field of study† (300-400 level)
3	Elective	Any field of study†
1	Elective	Any field of study† (if captsone performed in fall)
16	cr. hrs.	*(120 Total **MINIMUM** Hours Required-45 hours must be at the upper level)*

Notes:

† Electives can be from any field of study; they have been equally distributed so that you could complete a minor in another area of interest.

†† Senior Capstone must be taken during the senior year; specific time and length of time will vary based upon the experience. Capstone Experience fulfills the CCC-Basic Communication-Oral category.

* Students must take 2 of the following: American History / Western Civilization / Other World Civilizations

2018-2019

Department of Biology
State University of New York at Fredonia, Fredonia, NY 14063

Curriculum Checklist: B.S. Degree in Exercise Science
(Curriculum Code Number: 0423)

GROUP I: FREDONIA FOUNDATIONS -- On the back of this sheet. (18 hrs)
+ Please note that 12 of the 30 hours are Required Courses listed below.

GROUP II: REQUIREMENTS FOR MAJOR IN EXERCISE SCIENCE (36 hrs)
Students must maintain a minimum 2.00 GPA overall and in the major.

	COURSE TITLE AND NUMBER		CR. HRS	SEMESTER COMPLETED F / S - YEAR	GRADE	Q. Pts.
	BIOL 131	Introduction to Ecology and Evolution Lecture	3	F S		
	BIOL 132	Introduction to Ecology and Evolution Lab	1	F S		
	BIOL 133	Introductory Cell and Molecular Biology Lecture	3	S		
	BIOL 134	Introductory Cell and Molecular Biology Lab	1	S		
	BIOL 220	Principles of Human Nutrition	3	S		
*	BIOL 245	Human Anatomy and Physiology I Lecture and Lab	4	F		
*	BIOL 246	Human Anatomy and Physiology II Lecture and Lab	4	S		
	EXSC 250	Introduction to Applied Human Physiology	1	F		
*	EXSC 300	Exercise Physiology Lecture and Lab	4	F		
*	EXSC 302	Exercise Prescription	3	S		
*	EXSC 350	Kinesiology	3	S		
*	EXSC 425	Biomechanics	3	F		
+*	EXSC 491	Senior Capstone - Research OR	3	F S		
+*	EXSC 492	Senior Capstone - Internship OR	3	F S		
+*	EXSC 493	Senior Capstone - Course	3	F S		

GROUP III: SUPPORTING COURSES -- (25 hrs)

	COURSE TITLE AND NUMBER		HRS	F/S-YEAR	GRADE		HRS	F/S-YEAR	GRADE
+	General Chemistry I Lecture & Lab	CHEM 115	3	F		CHEM 125	1	F	
	General Chemistry II Lecture & Lab	CHEM 116	3	S		CHEM 126	1	S	
+	Statistics for Scientists	STAT 250	3	F S					
	College Physics I Lecture & Lab	PHYS 121	3	F		PHYS 123	1	F	
	College Physics II Lecture & Lab	PHYS 122	3	S		PHYS 124	1	S	
+	Introduction to Psychology	PSY 129	3	F S					
	Second Psychology Course	PSY XXX	3	F S					

*** GROUP IV: UPPER LEVEL ELECTIVE HOURS** (9 hrs)

Electives suggested for advanced study in Graduate or Professional Schools.

	HRS	F / S - YEAR	GRADE	Q. Pts.
Suggested for: **Pre-PT** - Additional Biology courses, Advanced Exercise Physiology				
Suggested for: **Pre-OT** - Abnormal Psychology, Developmental Psychology				
Suggested for: **Pre-AT** -Athletic Training Internships, Advanced Exercise Physiology				

GROUP V: ELECTIVES - 12 credits must be UL. Maximum of 9 Biology/Exercise Science credits. (32 hrs)

	COURSE NUMBER AND TITLE	HRS	F / S - YEAR	GRADE	Q. Pts.
Upper Level					
Upper Level					
Upper Level					
Upper Level					

* 33 credits counting toward 45 UL hour requirement

2018-2019

TOTAL MINIMUM HOURS REQUIRED: 120 hrs

Upper Level Electives for the Exercise Science Major

(Curriculum Code Number: 0423)

Exercise Science majors are required to take 9 hours of upper level Biology electives. You will select your electives in consultation with your advisor. Some examples are listed below:

* Abnormal Psychology

Advanced Exercise Physiology

Advanced Neurophysiology

Athletic Training Internship I

Athletic Training Internship II

Athletic Training Internship III

* Developmental Psychology

Mechanisms of Obesity

Muscles and Movement

Museum Practicum

Neurobiology

* Can be used as UL Biology/EXSC electives for students interested in OT programs.

2018-2019

Department of Biology

State University of New York at Fredonia

Mrs. Patricia S. Astry, Director of Medical Technology Program

234 Science Center ~~ (716) 673-3283 ~~ Fax: (716) 673-3493 ~~ Email: patricia.astry@fredonia.edu

A TYPICAL COURSE OF STUDY FOR A MEDICAL TECHNOLOGY MAJOR

(Curriculum Code Number: 0290)

Outlined below is a typical four-year program for a Medical Technology major at Fredonia. The requirements for graduation include a series of required courses and the completion of at least 120 hours of coursework. It is important to follow the course sequence as indicated so you can complete all requirements prior to the senior year internship. Typically, a minimum 3.00 GPA is required for entrance to the clinical internship. Medical Technology students may take upper level Biology courses listed on the back if interested, and if time permits. However, Medical Technology students are not required to take upper level Biology electives, and usually do not have room in their busy schedules for these courses.

FRESHMAN YEAR - FALL

Cr. Hrs.	Course Number	Course Title
1	BIOL 100	Studying for Success (Highly Recommended)
4	BIOL 131/132	Introductory Ecology and Evolution Lecture and Lab
4	CHEM 115/125	General Chemistry I Lec. & Lab *(FF: Nat. Sci.)*
3	*FF:*	*Social Science*
3	*FF:*	*Written Communication*
15	credit hours	

FRESHMAN YEAR - SPRING

Cr. Hrs.	Course Number	Course Title
4	BIOL 133/134	Introductory Cell and Molecular Biology Lecture and Lab
4	CHEM 116/126	General Chemistry II Lec. & Lab
3	STAT 250	Stat for Scientists *(FF: Math/Quant)*
3	*FF:*	*Humanities*
3	*FF:*	*Foreign Language*
17	credit hours	*(subtotal - 32 hours)*

SOPHOMORE YEAR - FALL

4	BIOL 237/238	Genetics Lecture & Lab
4	BIOL 245	Human Anatomy & Physiology I Lec & Lab
4	CHEM 215/225	Organic Chemistry I Lecture & Lab
3	*FF:*	*Arts*
15	credit hours	*(subtotal - 47 hours)*

SOPHOMORE YEAR - SPRING

4	BIOL 246	Human Anatomy & Physiology II Lec & Lab
1	BIOL 256	Introduction to Clinical Sciences
4	CHEM 216/226	Organic Chemistry II Lecture & Lab
3	*FF:*	*American History or Western Civilization or Other World Civilizations**
3	*Elective*	*Any field of study*
15	credit hours	*(subtotal - 62 hours)*

JUNIOR YEAR - FALL

4	BIOL 333/334	Biochemistry Lecture & Lab
3	BIOL 461	Immunology & Serology Lecture & Lab
4	PHYS 121/123	Physics I & Lab *(CCC: Nat. Sci.)*
3	*FF:*	*American History or Western Civilization or Other World Civilizations**
14	credit hours	*(subtotal - 76 hours)*

JUNIOR YEAR - SPRING

3	BIOL 338	Microbiology Lecture & Lab
1	BIOL 344	Parasitology
1	BIOL 453	Basic Hematology
4	PHYS 122/124	Physics II Lecture & Lab
3	*Elective*	*Any field of study*
2	*Elective*	*Any field of study*
14	credit hours	*(subtotal - 90 hours)*

SENIOR YEAR - FALL

CLINICAL INTERNSHIP

15	MEDT 490 - Clinical Internship (FF: Oral Communication)	
15	credit hours	*(subtotal - 105 hours)*

SENIOR YEAR - SPRING

15	MEDT 491 - Clinical Internship
15	credit hours -- *(120 Total MINIMUM Hours Required - 45 hours must be upper level)*

Notes:

* Students must take 2 of the following: American History / Western Civilization / Other World Civilizations

2018-2019

ACADEMIC ADVISOR: Professor Patricia S. Astry **STUDENT:**

Department of Biology
State University of New York at Fredonia, Fredonia, NY 14063

Curriculum Checklist: B.S. Degree in MEDICAL TECHNOLOGY
(Curriculum Code Number: 0290)

Profesor Patricia S. Astry, Director of the Medical Technology Program
Patricia.Astry@fredonia.edu -- 234 Science Center -- (716) 673-3283 -- FAX: (716) 673-3493

GROUP I: FREDONINA FOUNDATIONS -- On the back of this sheet. (21 hrs)
†Please note that 9 of the 30 hours are Required Courses listed below.

GROUP II: REQUIREMENTS FOR MAJOR IN MEDICAL TECHNOLOGY (33 hrs)
Students must maintain a minimum 2.00 GPA overall and in the major. A minimum 3.00 GPA is required for entrance to the clinical program.

		COURSE TITLE AND NUMBER	CR. HRS	SEMESTER COMPLETED F / S - YEAR	GRADE	Q. Pts.
	BIOL 131	Introductory Ecology and Evolution Lecture	3	F		
	BIOL 132	Introductory Ecology and Evolution Lab	1	F		
	BIOL 133	Introductory Cell and Molecular Biology Lecture	3	S		
	BIOL 134	Introductory Cell and Molecular Biology Lab	1	S		
*	BIOL 237	Genetics Lecture	3	F		
*	BIOL 238	Genetics Lab	1	F		
*	BIOL 245	Human Anatomy and Physiology I Lecture and Lab	4	F		
*	BIOL 246	Human Anatomy and Physiology II Lecture and Lab	4	S		
	BIOL 256	Introduction to Clinical Sciences	1	S		
*	BIOL 333	Biochemistry Lecture	3	F		
*	BIOL 334	Biochemistry Lab	1	F		
*	BIOL 338	Microbiology Lecture and Lab	3	S		
*	BIOL 344	Parasitology	1	S		
*	BIOL 453	Basic Hematology	1	S		
*	BIOL 461	Immunology and Serology Lecture and Lab	3	F		

GROUP III: SUPPORTING COURSES -- (26 hrs)

	COURSE TITLE AND NUMBER		HRS	F/S-YEAR	GRADE		HRS	F/S-YEAR	GRADE
†	General Chemistry I Lecture & Lab	CHEM 115	3	F		CHEM 125	1	F	
	General Chemistry II Lecture & Lab	CHEM 116	3	S		CHEM 126	1	S	
*	Organic Chemistry I Lecture & Lab	CHEM 215	3	F		CHEM 225	1	F	
*	Organic Chemistry II Lecture & Lab	CHEM 216	3	S		CHEM 226	1	S	
		CIRCLE ONE							
†	Statistics for Scientists	STAT 250	3	F S					
	Physics I Lecture & Lab	PHYS I 121 *or* 230	3 or 4	F S		*and* PHYS I 123 *or* 232	1	F S	
	Physics II Lecture & Lab	PHYS II 122 *or* 231	3 or 4	F S		*and* PHYS II 124 *or* 233	1	F S	

GROUP IV: CLINICAL INTERNSHIP -- *30 hours to be performed at an accredited hospital program.* (30 hrs)

DEPT	COURSE NUMBER AND TITLE	NAME OF HOSPITAL	HRS	F/S-YEAR	GRADE
MT	*490 / 491 Clinical Studies in Med. Tech.*				

GROUP V: ELECTIVES (10 hrs)

	DEPT	COURSE NUMBER AND TITLE	HRS	F / S - YEAR	GRADE	Q. Pts.
1.						
2.						
3.						
4.						

TOTAL MINIMUM HOURS REQUIRED: 120 hrs - 45 hours must be upper level

* *62 credits counting toward a 45 hor upper level requirement.*

2018-2019

Upper Level Electives for the Medical Technology Major

(Curriculum Code Number: 0290)

It should be noted that upper level Biology electives are not required for Medical Technology majors, and there is typically little time for electives in this program. However, for a Medical Technology student who has the time and interest, the list below includes many of the courses that are considered electives for the Medical Technology degree. Most of these courses are offered on a yearly or every other year basis. In most cases, you will need junior standing to be eligible for these courses (check the College Catalog for prerequisites). If you are interested in any of these electives, please check the most recent Course Offerings online, or ask your Academic Advisor for more information.

Advanced Neurophysiology
Animal Behavior
Animal Communication
Aquatic Biology
Biological Conservation
Biostatistics
Cancer Biology
Cell and Molecular Biology
Cell Signaling
Comparative Vertebrate Anatomy
Designer Genetics
Developmental Biology
Developmental Neurobiology
Evolution
Global Climate Change
Lab Supervision in Biology
Mammalian Physiology
Molecular Biology of Disease
Molecular Genetics Lab
Molecules and Medicine
Muscles and Movement
Museum Practicum
Neurobiology
Plant Taxonomy
Sociobiology
Tropical Islands
Undergraduate Research
Vertebrate Anatomy

2018-2019

The Department of Biology

State University of New York at Fredonia, Fredonia, New York 14063

(716) 673 - 3282 – Biology website: www.fredonia.edu/biology/ – Fax: (716) 673 - 3493

A TYPICAL COURSE OF STUDY FOR A
MOLECULAR GENETICS MAJOR

(Curriculum Code Number: 0837)

Outlined below is a typical four-year program for a Molecular Genetics major at Fredonia. The proposed course load attempts to present the required courses as early as possible so that one may have a very flexible senior year, which should allow you to become more involved in electives offered in your major. Some of the Biology electives, usually taken in the junior and senior years, are listed on the reverse side of this page. Remember, there is some flexibility, so your actual program may differ somewhat. Key to a four-year degree: 1) select a major within your freshman year; 2) take an average of 15 new credits each semester; 3) pass all of your courses; 4) keep your Biology and Chemistry courses "on track"; and 5) work with your advisor to discuss your progress toward the four-year degree.

FRESHMAN YEAR -- FALL

Cr. Hrs.	Course Number	Course Title
1	BIOL 100	Studying for Success (Highly Recommended)
4	BIOL 131/132	Intro Ecology and Evolution Lecture & Lab
4	CHEM 115/125	General Chemistry I Lect. & Lab *(FF: Nat. Sci.)*
3-4	MATH 120	Survey of Calculus I *(FF: Math/Quant)*
	or	
	MATH 122	University Calculus I
3	*FF:*	*Written Communication*
15-16	credit hours	

FRESHMAN YEAR -- SPRING

Cr. Hrs.	Course Number	Course Title
4	BIOL 133/134	Intro Cell and Molecular Biology Lecture & Lab
4	CHEM 116/126	General Chemistry II Lecture & Lab
3-4	MATH 121	Survey of Calculus II
	or	
	MATH 123	University Calculus II
3	*FF:*	*Foreign Language*
14-15	credit hours	*(subtotal = 29-31 credits)*

SOPHOMORE YEAR -- FALL

4	BIOL 237/238	Genetics Lecture & Lab
4	CHEM 215/225	Organic Chemistry I Lecture & Lab
3	*FF:*	*Arts*
3	*FF:*	*Western Civilization or American History or Other World Civilizations**
14	credit hours	*(subtotal = 43-45 credits)*

SOPHOMORE YEAR -- SPRING

3	BIOL 243	Organismal Biology
4	CHEM 216/226	Organic Chemistry II Lecture & Lab
3	Elective	Any field of study†
3	*FF:*	*Humanities*
3	*FF:*	*Social Sciences*
16	credit hours	*(subtotal = 59-61 credits)*

JUNIOR YEAR -- FALL

4	BIOL 333/334	Biochemistry Lecture & Lab
4	BIOL 380/381	Cell & Molecular Biology Lecture & Lab
4	PHYS 121/123	Physics I & Lab *(CCC: Nat. Sci.)*
3	*FF:*	*Western Civilization or American History or Other World Civilizations**
15	credit hours	*(subtotal = 74-76 credits)*

JUNIOR YEAR -- SPRING

2	BIOL 437	Molecular Genetics Lab
4	PHYS 122/124	Physics II & Lab
3	Elective	Any field of study†
3	Elective	Any field of study†
3	Elective	Any field of study†
15	credit hours	*(subtotal = 89-91 credits)*

SENIOR YEAR -- FALL

3	BIOL 435	Developmental Biology Lecture & Lab
3	BIOL 491, 492 or 493	Capstone Experience (Research, Internship, or Course) †† (FF Oral Communication)
3	BIOL	Elective (300 or 400 level)
3	BIOL	Elective (300 or 400 level)
3	Elective	Any field of study †
1	Elective	Any field of study †
16	credit hours	*(subtotal = 105-107 credits)*

SENIOR YEAR -- SPRING

3	BIOL 338	Microbiology
3	BIOL	Elective (300 or 400 level)
3	Elective	Any field of study † (300-400 level)
3	Elective	Any field of study †
3	Elective	Any field of study †
15	cr. hrs.	*(120 Total **MINIMUM** Hours Required - 45 hours must be upper level)*

† Electives can be from any field of study; they have been equally distributed so that you could complete a minor in another area of interest. Many students choose Biology Electives that allow them to specialize.

* Students must take 2 of the following: American History / Western Civilization / Other World Civilizations

†† Senior Capstone must be taken during the senior year; specific time and length of time will vary based upon the experience. Capstone Experience fulfills the FF Oral Communication Category.

2018-2019

Department of Biology

State University of New York at Fredonia, Fredonia, NY 14063

Curriculum Checklist: B.S. Degree in MOLECULAR GENETICS

(Curriculum Code Number: 0837)

GROUP I: FREDONIA FOUNDATIONS-- On the back of this sheet. **(21hrs)**

† *Please note that 9 of the 30 hours are Required Courses listed below.*

GROUP II: REQUIREMENTS FOR MAJOR IN BIOLOGY -- **(34 hrs)**

Students must maintain a minimum 2.00 GPA overall and in the major.

	COURSE NUMBER AND TITLE		CR. HRS	SEMESTER COMPLETED F / S - YEAR	GRADE	Q. Pts.
	BIOL 131 Introductory Ecology & Evolution Lecture		3	F		
	BIOL 132 Introductory Ecology & Evolution Lab		1	F		
	BIOL 133 Introductory Cell & Molecular Biology Lecture		3	S		
	BIOL 134 Introductory Cell & Molecular Biology Lab		1	S		
*	BIOL 237 Genetics Lecture		3	F		
*	BIOL 238 Genetics Lab		1	F		
*	BIOL 243 Organismal Biology Lecture		3	S		
*	BIOL 333 Biochemistry Lecture		3	F		
*	BIOL 334 Biochemistry Lab		1	F		
*	BIOL 338 Microbiology Lecture and Lab		3	S		
*	BIOL 380 Cell & Molecular Biology Lecture		3	F		
*	BIOL 381 Cell & Molecular Biology Lab		1	F		
*	BIOL 435 Developmental Biology Lecture and Lab		3	F		
*	BIOL 437 Molecular Genetics Lab		2	S		
†*	BIOL 491 Senior Capstone - Research	OR	3	F S		
†*	BIOL 492 Senior Capstone - Internship	OR	3	F S		
†*	BIOL 493 Senior Capstone - Course		3	F S		

GROUP III: BIOLOGY ELECTIVES -- **(9 hrs)**

BIOL 300-, 400-, 500-level courses. No more than 3 cr. hrs. of UG Research, Lab Supervision, Museum Practicum or Internship.

	COURSE NUMBER AND TITLE	HRS	F / S - YEAR	GRADE	Q. Pts.
	BIOL				
	BIOL				
	BIOL				
	BIOL				

GROUP IV: SUPPORTING COURSES -- **(30-34 hrs)**

	COURSE TITLE AND NUMBER		HRS	F/S-YEAR	GRADE		HRS	F/S-YEAR	GRADE
†	General Chemistry I Lecture & Lab	CHEM 115	3	F		CHEM 125	1	F	
	General Chemistry II Lecture & Lab	CHEM 116	3	S		CHEM 126	1	S	
*	Organic Chemistry I Lecture & Lab	CHEM 215	3	F		CHEM 225	1	F	
*	Organic Chemistry II Lecture & Lab	CHEM 216	3	S		CHEM 226	1	S	
		(Circle one)				*For 3/4 Dental & 3/4 Optometry choose MATH 120 BELOW*			
†	Calculus I & II	MATH 120 (or 122)	3 or 4	F S		*and* MATH 121 *or* 123	3 or 4	F S	
	Physics I Lecture & Lab	PHYS I 121 *or* 230	3 or 4	F S		*and* PHYS I 123 *or* 232	1	F S	
	Physics II Lecture & Lab	PHYS II 122 *or* 231	3 or 4	F S		*and* PHYS II 124 *or* 233	1	F S	

GROUP V: ELECTIVES -- 2 credits must be UL. Maximum of 11 Biology credits. **(22-26 HRS)**

	COURSE NUMBER AND TITLE	HRS	F / S - YEAR	GRADE	Q. Pts.
Upper Level					

* 43 credits counting toward 45 UL hour requirement

2018-2019

TOTAL MINIMUM HOURS REQUIRED: 120 hrs

Upper Level Electives for the Molecular Genetics Major

(Curriculum Code Number: 0837)

The list below includes many of the courses that are considered upper level electives for the Molecular Genetics degree. Most of these courses are offered on a yearly or every other year basis. In most cases, you will need junior standing to be eligible for these courses (check the College Catalog for prerequisites). If you are interested in any of these electives, please check the most recent Course Offerings Online, or ask your Advisor for more information.

Advanced Neurophysiology
Animal Behavior
Animal Communication
Aquatic Biology
Basic Hematology
Biological Conservation
Biostatistics
Cancer Biology
Cell Signaling
Designer Genetics
Developmental Neurobiology
Evolution
Global Climate Change
Immunology
Mammalian Physiology
Molecular Biology of Disease
Molecules and Medicine
Muscles and Movement
Museum Practicum
Neurobiology
Parasitology
Plant Taxonomy
Sociobiology
Tropical Islands
Undergraduate Research
Vertebrate Anatomy

2018-2019

Pre-Medicine and Allied Areas

Fredonia graduates have enjoyed considerable success in gaining entry to medical, veterinary, osteopathic, optometry, dental and other professional health programs. The Health Professions Advising Committee closely advises and assists each pre-medical student and prepares a committee letter on his/her behalf. The complete credentials file is assembled by the Biology Department and submitted in a timely manner on behalf of each applicant.

While medical schools do not stipulate a particular major program of undergraduate study, they do require that students have minimum preparation in a number of areas including Biology, Chemistry, English, and Physics. The Fredonia Biology major meets the requirements for American medical schools and many students choose it as the most appropriate undergraduate pre-med program. Pre-Health students may select any major at Fredonia. Students interested in careers in the health professions should register with the Health Professions Advising Program as freshmen to ensure appropriate advice and assistance (register at the Department of Biology Office, Room 221, Science Center).

The Health Professions Advising Committee at Fredonia advises students on course selection and extracurricular activities. The committee interviews sophomores to provide advice early in the academic program and when the students are preparing to apply to health professional schools. It is highly recommended that all pre-health students use the advising services of the Health Professions Advising Committee.

Students who are seriously considering a medical, veterinary or dental career should seek appropriate summer employment/internship opportunities early in their undergraduate experience. Fredonia students regularly intern at local practices and clinics.

Students interested in pre-health (other than Medical Technology) are advised to take BIOL 275 Health Professions Careers in their sophomore year. Medical Technology students will take BIOL 256 Introduction to Clinical Science in their sophomore year.

The book, *Medical School Admissions Requirements* (AAMC, Washington, D.C.) is essential reading for any undergraduate who is seriously considering medical school. Students may borrow the copy of this book from the Health Professions Advising Office. The office has other books and DVDs on careers in medicine and the health professions that students can borrow as well.

For additional information on pre-med, pre-vet, pre-dental, pre-optometry, please contact Dr. Ted Lee. For additional information on other pre-health programs (pre- PA, pre-Pharmacy, pre-PT, pre-OT, pre-nursing), please contact Department Chair Patricia Astry.

Medical and Pharmacy

Lake Erie College of Osteopathic Medicine (LECOM) Medical College and School of Pharmacy

Early Acceptance Program

High school students and Fredonia freshmen and sophomores may apply to this program. The program contains 4+4 and 3+4 tracks; most students will do the 4+4 track- 4 years at Fredonia and 4 years at LECOM (Medical College or School of Pharmacy). Highly motivated students can do the 3+4 track with 3 years at Fredonia and 4 years at LECOM (Medical College or School of Pharmacy). Academic credits from the first year at LECOM will transfer to Fredonia for the students' BS degrees.

- For the 3+4 Track
- Eligible high school students and Fredonia freshmen must have:
  - ✓ at least a 93 grade point average

  And one of the following (note: SAT scores are not superscored)
  - ✓ SAT scores of 1280 (old SAT) or better
  - ✓ SAT scores of 1340 (new SAT) or better
  - ✓ ACT scores of 28 or higher

- For the 4+4 Track
- Eligible high school students and Fredonia freshmen must have:
  - ✓ at least a 93 grade point average

  And one of the following (note: SAT scores are not superscored)
  - ✓ SAT scores of 1170 (old SAT) or better
  - ✓ SAT scores of 1240 (new SAT) or better
  - ✓ ACT scores of 26 or higher

- To apply to the 4+4 track, eligible Fredonia sophomores must have:
  - ✓ a 3.4 or higher overall GPA
  - ✓ a 3.2 or higher science GPA

At Fredonia, students must have a 3.4 or higher overall GPA and a 3.2 or higher GPA in the sciences.

Optometry

SUNY Optometry

Combined Degree (3/4) Program

High school students and Fredonia freshmen and sophomores may apply to this program. Students complete 3 years at Fredonia and 4 years at SUNY Optometry. Academic credits from SUNY Optometry will transfer to Fredonia for the students' BS degrees.

- Eligible high school students must have:
  - ✓ at least a 93 grade point average
  - ✓ SAT scores of 1300 or better (with a minimum of 670 math and 550 verbal)
- Eligible SUNY Fredonia sophomores may apply with:
  - ✓ at least a 3.3 overall GPA and a minimum 3.3 GPA in the sciences and math

At Fredonia students must have at least a 3.3 overall GPA, a 3.3 GPA or higher in the sciences and math and obtain a minimum total science score of 330 on the OAT with no individual section less than 310.

New England College of Optometry (NECO)

3 + 4 Program

High School seniors and Fredonia freshmen and sophomores may apply to this program. Academic credits from the first year at NECO will transfer to Fredonia for the students' BS degree.

- Eligible high school students must have:
  - ✓ High school average of 90 or higher
  - ✓ SAT of 1200, critical reading and math or ACT of 26
- All students in the program must have a 3.3 overall GPA or higher, a math and science GPA of 3.1, and have received a 320 or higher for the academic average of the Optometry Admission Test (OAT) with no OAT sub-score below 290.

Pharmacy

University of Buffalo School of Pharmacy and Pharmaceutical Sciences

3 + 4 Program

Fredonia juniors may apply for early admission into the Buffalo Pharmacy Program. Academic credits from the School of Pharmacy will transfer to Fredonia for the students' BS degree.

- Minimum requirements
  - ✓ 3.5 overall grade point average
  - ✓ 3.5 Science and Math GPA
  - ✓ a grade of C or higher in all pre-requisite classes
  - ✓ take the PCAT exam: there is not a minimum score, but applicants typically present a score of at least 300
  - ✓ apply by October 1st of junior year using PharmCAS

Additional information about the Health Professions Advising Committee can be found at http://home.fredonia.edu/prehealth

The Capstone Experience

The Capstone Experience is designed to help students apply and expand their biological knowledge through a number of academic opportunities. The Capstone focuses on problem solving, oral communication and written communication; increases and expands students' knowledge in the biological disciplines and enhances preparation for graduate school, professional school or the workforce. Students entering the department in Fall 2014 will be required to perform a capstone experience in their senior year.

The requirements for the capstone experience can be met in the following ways:

Biology majors – Capstone Research, Internship or Course

Biology Adolescence Education majors – Semester of student teaching

Exercise Science majors – Capstone Research, Internship or Course

Medical Technology majors – Twelve month internship at accredited hospital

Molecular Genetics majors – Capstone Research, Internship or Course

I. Biology, Exercise Science and Molecular Genetics Majors

A. Capstone Research

Expectations – Capstone research requires at least 3 credits of undergraduate research during the senior year, or a 10 week summer research position (REU or in our department) during the summer before the senior year. Your faculty research mentor will bear responsibility for the evaluation of the learning and inquiry experience. A formal paper will be required, and a formal oral presentation will be given during a capstone undergraduate/internship symposium. Your advisor will help you determine if your capstone experience should be research.

For additional information about research, see Special Academic Programs, page 33.

B. Capstone Internship

Expectations – Capstone internship requires a 3 credit internship experience (120 hours). Acceptable experiences include an applied research project or an extensive literature review based on an interesting question developed during the internship. A site supervisor will provide evaluations to the faculty mentor; the faculty mentor will bear responsibility for the final evaluation of the learning experience. A formal paper will be required, and a formal oral presentation will be given during a capstone undergraduate/internship symposium. Your advisor will help you determine if your capstone experience should be an internship. (Please note – job shadowing internships are available and valuable, but an internship limited to job shadowing does not count as a capstone experience.

For additional information about internships, see Special Academic Programs, page 33.

C. Study Abroad

Expectations – A study abroad experience can fill the Senior Capstone requirement if you perform an internship or take a course that is biological or health-related in nature.

For additional information about study abroad, see http://home.fredonia.edu/studyabroad

D. Capstone Course

Capstone sections of our upper level courses will be offered on a rotating basis. Some of these courses will be modifications of currently existing courses; other will be new courses. Expectations for a capstone course experience will be the same as for research and internships – inquiry based learning/problem solving, written and oral presentation. Students will present their oral and written presentations in class. Your advisor will help you determine if your capstone experience should be a capstone course.

II. Medical Technology Major Internship

This is a 12 month internship performed at a hospital based school approved by the National Accrediting Agency for Clinical Laboratory Sciences. Students study clinical microbiology, immunology, chemistry, immunohematology, parasitology, virology, urinalysis and toxicology as they prepare for a career in clinical laboratory science. This internship is a requirement of the Medical Technology program.

III. Biology Adolescence Education Majors Student Teaching

Students spend their final semester student teaching biology at a local high school or middle school. Student teaching is a requirement for the Biology Adolescence Education degree.

For additional information about the Senior Capstone, please consult the Capstone Manual, https://drive.google.com/drive/folders/0B7upgZc2SF0WZkc5R2staURneUU

Biology Honors Program

This program provides talented Biology department majors the opportunity to perform research at an advanced level. Honors students will perform a minimum of two semesters of research, produce a formal thesis and offer a lecture to the campus and a private thesis defense to the faculty. Honors students will be recognized with a biology cord at graduation and the statement, Honors Biology Major on the student's transcript. The program is open to Biology students of sophomore standing or higher who have maintained a 3.5 GPA in stipulated courses.

Professional Behavior Expectations for Students

Being successful in college requires more than getting good grades. Observing the behavioral expectations listed below will increase your potential for success within the Department of Biology.

I. General Expectations:

- Show respect to faculty and other students
- Faculty post office hours. Plan to visit at that time or email them if you would like to set up an appointment at other times.

- If you schedule an appointment, please be there on time. If you can't make the meeting, notify the faculty member ASAP.
- When visiting faculty, knock on the door and wait until you are welcomed in.
- Don't interrupt conversations already in progress, even if you only have a quick question.
- The accepted address for faculty is 'Professor Smith /or "Dr. Smith". It is considered rude to call faculty by their first name or by their last name only. Do not do this unless you have explicit permission from the faculty member.
- Coming to class and lab is your professional obligation. If you fail to do so, you should not expect your professor to tell you what you missed, or to re-teach you the material. The obvious exception to this is illness or a true emergency.

II. Email:

- Check your email daily – we use this vehicle to transmit important information to students
- Use an appropriate tone for email with faculty and staff; not the causal tone used when communicating with friends.
- Much information about the department and your courses can be found in the university catalog, this handbook, the department webpage and course syllabi. Check those resources to answer your questions before emailing faculty and staff.
- While email is generally reliable, sometimes messages are not received. If you don't get a response to an important email, you may wish to re-send the email, visit the faculty member during office hours or telephone the professor.

III. Classroom:

- Attend all classes and arrive on time.
- Be attentive. Participate. Don't pack up to leave until the instructor dismisses you.
- Visit the restroom before class. Bring what you need to class so you do not need to leave the room during class.
- Turn your cell phone off before class. Do not text, email, check Facebook, play games, etc. during class.
- Review your notes regularly, keep up with assigned reading and ask questions as they arise. Don't wait until just before an exam to start studying or ask the instructor for help.

IV. Laboratory:

- Attend all labs and be prepared to participate.
- If there is a possibility you may need to miss a lab, alert your instructor right away. Some faculty will not allow make-ups due to the complexity of lab set-up.
- Labs are longer than lecture and require more interaction and conversation between students. Behave in a professional manner. When writing letters of reference, faculty reflect on student behavior and maturity as well as accomplishments. Profane language and gossip don't reflect well on a student's character.
- It is expected you will read assigned material prior to lab and be well-prepared. However, faculty expect students to have questions. If you don't know how to use a piece of equipment or if you have a question about a procedure, ask your instructor.

V. Moving towards Success:

- Be an engaged student and take personal responsibility for your learning.
- Work with your advisor to ensure you will fulfill all requirements for graduation.
- Your course syllabi are contracts between you and the instructor. Refer to it before asking questions that are answered in the syllabus.

- Make allowances for computer glitches. Maybe your printer really did die the morning the assignment is due, but that may not be an acceptable excuse for turning an assignment late. Save backups on a thumb drive and find another computer to print your assignment.
- Work with your advisor and Career Development professionals to ensure you are well-prepared for life after graduation – employment or graduate or professional school.
- Develop your interpersonal skills. Talk to faculty and learn how to work productively with other students in and out of class.
- Get to know one or more faculty well enough so that they can write a meaningful and supportive letter of reference for you prior to graduation.
- College is very different than high school. Be alert to struggles and see your professor early on if you need help. Waiting until the end of the semester to get assistance is too late!

Academic Integrity

The university expects students to be aware of and obey the academic integrity policies as set forth in the college catalog. It is your responsibility to read this policy and be aware of disciplinary consequences for violation of the integrity. Your advisor can answer questions regarding this information.

http://fredonia.smartcatalogiq.com/en/2017-2018/Catalog/Academic-Policies/Academic-Integrity-Policy

Some information from the catalog is excerpted, below:

Violations of academic integrity are described within four broad, overlapping categories:
Fraud, Plagiarism, Cheating, and Collusion.

Fraud
Behaving deceptively, misrepresenting oneself or another person, and falsifying official print and/or electronic documents are actions that seriously undermine the integrity of any social institution and may result in criminal prosecution. Examples include forging or altering official school documents, and taking an exam in place of another student.

Plagiarism
Plagiarism consists of presenting the work of others as one's own. It is unethical to copy directly the words or work of other authors without giving them credit. It is also unethical to rearrange or add a few words to another author's text while leaving the majority unaltered or to take an author's unique idea or discovery and to represent it as one's own. Examples include copying the work of another author without giving proper credit in the text ; neglecting to cite the original in a footnote; implying that another author's words, works, or ideas are one's own by neglecting to use quotation marks.

Cheating
In all academic situations, any behavior that subverts the purpose of an academic assignment constitutes cheating, whether one actively commits the act of dishonesty on one's own behalf or enables someone else to do so. Examples include copying someone else's work or permitting one's own work to be copied, Intentionally providing or seeking questions to an exam that will be given in a later section or used as a make-up exam, communicating or sharing information during an exam.

Collusion
Most colleges and universities support some opportunities for collaborative learning, but unauthorized collaboration is considered collusion. Unless collaboration is expressly permitted by the instructor, students should work alone. Even when an instructor authorizes collaboration, collusion may still occur. In all cases, work submitted should reflect an individual's own effort. Examples include when a pair or larger group of

students studies a problem, one of the students formally writes and/or types the results, the other members of the group copy the results, and each individual submits the work as his/her own, or when a pair or larger group of students work on a series of problems or tasks, each student completes a portion of the problem set or task, the students combine their work, and each student submits the entire problem set or task as his/her own.

Sanctions/Penalties
Depending upon the offense, sanctions may include but are not limited to the following: A formal warning, a grade of zero being assigned to the particular performance, and/or a failing grade being given for the course, placing the student on disciplinary probation, temporarily suspending the student, or permanently expelling the student from the university.

Advising

Every Biology Department student is assigned an advisor. This faculty member will help you move towards success in your academic career at Fredonia. They will assist you with course scheduling, concerns about grades and preparing for opportunities after graduation. The more prepared you are for meetings with your advisor, the more assistance they can provide you.

General Information:

- You can find out who your advisor is in "Your Connection".
- See your advisor whenever you have questions or concerns about your academic progress, prerequisites, degree requirements, and related concerns.
- Discuss your grade concerns with your professor and advisor. Grades of "D" and "E" can be quite damaging to a transcript. Your advisor can help you determine if you should withdraw from the course.
- Applying to graduate school or professional school or for a job requires a lot of time and attention. The following people can help you: Your advisor, specific faculty as listed in the Faculty/Staff roster (page 31), professionals from the Career Development Office.

Advisement prior to Registering for courses:
You are required to meet with your advisor each semester during advisement week to discuss your progress, concerns and course schedule for the upcoming semester. This is also a time to discuss your educational and career goals.

- You will receive information about course advising via email; be sure to read it thoroughly. Make sure to sign up for advising at least 24 hours in advance; faculty post sign-up sheets outside their offices or make electronic scheduling available through Google. Pick times early in the week in case you have questions later.
- Use the program checklists to determine what courses (major, supporting and General Education) you need for the next semester.
- Check to see if you have all the prerequisites for courses you wish to take.
- Come to your meeting prepared with a tentative list of courses and alternates.
- In addition to bringing relevant questions and a tentative schedule, please be prepared to discuss the following questions with your advisor according to the semester. (Note these questions are designed to begin first semester freshman year. Transfers should begin with the questions relevant to the level at which they enter the program.)

Freshman year, fall semester

- ✓ Why did you pick this major?

- ✓ What do you like about biology?
- ✓ What are you struggling with?
- ✓ What do you perceive to be your strengths?

Freshman year, spring semester

- ✓ What do you like about biology?
- ✓ What are you struggling with?
- ✓ What do you perceive to be your strengths?

Sophomore year, fall semester

- ✓ Are there any areas you are struggling with?
- ✓ What do you hope to do after graduation?
- ✓ What would you like to do for a capstone experience, and why?

Sophomore year, spring semester

- ✓ Are there any areas you are struggling with?
- ✓ What do you hope to do after graduation?
- ✓ What would you like to do for a capstone experience, and why?

Junior year, fall semester

- ✓ What do you hope to do after graduation? What do you need to do to increase your ability to achieve this goal?
- ✓ Have you submitted your Capstone Declaration form to your advisor yet?
- ✓ What are your plans for your capstone?

Junior year, spring semester

- ✓ What are you plans for your capstone?
- ✓ If you are performing capstone research, internship or study abroad, have you made necessary arrangements?

Senior year, fall semester

- ✓ How is your capstone experience progressing?

- ✓ What do you hope to do after graduation?
- ✓ What are you doing to achieve this goal?

Senior year, spring semester

- ✓ If your capstone is not yet complete, when will it be complete?
- ✓ What are your plans after graduation?
- ✓ If your goal (employment, graduate school, etc.) is not yet achieved, what are you doing to achieve it?

Transfer Credit

If you wish to take a course at another college and transfer it to Fredonia, you must do the following:

- Check course equivalencies at https://connect.fredonia.edu/yourconnection/FRD_TransArt.P_TransArt
- If you find an equivalent course at another college, you must then fill out the transfer credit approval form at https://home.fredonia.edu/sites/default/files/section/registrar/_files/14140_Transfer_Credit_Approval.pdf
- Bring the form to the Administrative Suite in the Science Center, and request the Department Chair approve and sign it.
- Return the completed, signed form to the Office of the Registrar.
- After completing the course, request the college send an official transcript to the Fredonia Office of the Registrar.
- If you think the course you wish to take is equivalent to a particular major requirement or CCC at Fredonia, but is not listed as such, you will need to attach a copy of the course description to the transfer credit approval form.
- If you submit the approval form to the Registrar and then do not take the course, please notify the Registrar.

Students failing to get approval prior to taking the course at another college sometimes find the course does not transfer. Following the instructions listed above will ensure you don't spend time and money needlessly!

Specialized Academic Programs

Undergraduate Research

The dictionary defines research as the *'diligent and systematic inquiry or investigation into a subject in order to discover or revise facts, theories, and applications.'* and as a '*gathering of data, information and facts for the advancement of knowledge.'*

Scientists performing biological research pose questions about many aspects of the natural world – one scientist may wonder if a particular water pollutant harms the development and growth of fish. Another may wonder if a particular food supplement can aid in human weight loss. After the area of interest is identified, the scientist forms a hypothesis, designs an experiment, collects and analyzes data and draws conclusions.

Fredonia Biology faculty perform research in the areas of molecular and cellular biology, organismal biology, and ecology. Research opportunities are available at the 200, 400 and capstone level, talk with your advisor if you are interested in performing research.

Internship

The Fredonia Career Development Office offers the following definition of an internship – *"An internship is a learning experience gained by working in a position related to a student's major or career field. Internships provide hands-on experience that can confirm or reject tentative career choices; help to develop useful career building skills; show potential employers evidence of the ability to apply skills in a related work environment and make students more attractive candidates for employment, professional or graduate school."*

Internships generally fall into one of three categories:

- *Job Shadowing (200 level)* is very helpful for underclassmen wanting to learn more about a particular career. Students interested in the health sciences will often job shadow certified health professionals.

- A *Work Experience Internship (400 level)* requires the upper-level student to apply concepts he/she has learned in school to a work-related situation. The student gains work experience in their field of study; the internship may also be part of a degree program required for professional certification and licensure (as in the case of the clinical laboratory internship required for Medical Technology).

- A *Research Internship (400 level)* allows upper-level students to research a particular question for an institution or organization. For example, a student intern working with a local health department might obtain and test lake water samples for evidence of pollution. Or a student intern in a retail pharmacy may compare the effectiveness of different approaches to patient education.

400 Level internships often serve as capstone internships, talk with your advisor if you are interested in performing an internship.

What are the benefits of research and internships?

Becoming involved in research while you are an undergraduate has many advantages.

- It allows you to put into practice what you have learned in the classroom;
- It complements upper-level coursework;
- It teaches you how to critically read a journal article;
- It allows you to become deeply engaged in a problem of current interest in your field and work on it over an extended time;
- It gives you an opportunity for independent learning and creativity;
- It gives you more experience with scientific writing;

- And it generally gives a significant advantage when applying to graduate school or industry, especially if you have generated a publication.

Performing a type of internship allows many of the same benefits as research. In particular, it gives you an opportunity for independent learning and creativity, gives you insight into what employers expect from their employees, and it may be a stepping stone to employment with the organization for which you are interning.

Study Abroad

There are a variety of opportunities for Fredonia students to study abroad in courses lasting several weeks to a semester long experience. Biology Department majors must work carefully to ensure that they stay on track with their major requirements if they choose to study abroad for a semester. Study abroad experiences may be able to count as capstone internships. Additional information can be obtained from the Department of International Education. http://www.fredonia.edu/internationaleducation/studyabroad/

Student Support Services

A variety of campus offices exist to offer students assistance in the areas of career development, learning and personal health.

Career Development Office

The Career Development Office (CDO) provides a link between the campus and the world of work. The professional staff helps freshmen through alumni to:

- explore options and make career/major/job choices
- plan strategies to gain experience and identify skills to become competitive
- identify and apply for internship opportunities
- develop skills to implement a successful job search
- learn how to apply to graduate or professional school
- locate information and opportunities to make decisions or implement plans
- get connected to employers and graduate schools

The *Internships* section of the CDO website lists a wide variety of internship opportunities, a searchable database of internships previously held by Fredonia students, and current internship policies and procedures. Career counselors can help students find internship opportunities related to their interests and goals, as well as create an effective resume and cover letter.

Contact Information: The Career Development Office is located on the second floor of Gregory Hall. Appointments can be made online from the CDO website at http://www.fredonia.edu/cdo/ or by calling (716) 673-3327.

Counseling Center

Sometimes personal and emotional problems arise that could interfere with your academic work. The Fredonia Counseling Center (SFCC) can help. The Center offers free, confidential, and individualized services by licensed mental health professionals to all registered students.
The Counseling Center is located in LoGrasso Hall. Appointments can be made in person at the reception desk or by telephone at (716) 673-3424. Information about services being offered for the current semester including

groups, workshops, and wellness ideas and links can be accessed through the center's website at www.fredonia.edu/counseling.

Student Health Center

The Student Health Center is staffed by a board-certified physician, two nurse practitioners, registered nurses, a lab technologist and a secretary. Staff members strive to provide quality health care for the student population in a caring, confidential, outpatient clinic setting. Health services are funded by the mandatory health fee paid each semester; most services at the health center and many medications are provided without any additional charge to the student.

The Health Center is located in LoGrasso Hall, and is open from 8:00 a.m. to 5:00 p.m., Monday through Friday, and Saturday from 10:00 a.m. until 1:00 p.m. When necessary, referrals can be made to private physicians or specialists in the local area. For more information, call (716) 673-3131 or email health.center@fredonia.edu.

Learning Center/Disability Support Services

The Learning Center is a place where any Fredonia student can go to get help from student tutors. Tutoring is free and is available in most subject areas on a drop-in basis. Subject areas include but are not limited to: math, English/writing, computer science, physics, chemistry, psychology, sociology, Spanish, economics, business administration, accounting, biology, geology and history. In addition to tutoring services, the Learning Center provides language support services for English as a second language (ESL) and is also the home of Disability Support Services for Students.

The Learning Center is always looking for successful students who are interested in becoming tutors. If you think you might be interested in being a tutor, contact the Center.

The Center is located on the fourth floor of Reed Library, and can be reached by calling (716) 673-3550 or by email at learning.center@fredonia.edu. The Learning Center's website is located at http://www.fredonia.edu/tlc.

Scholarships

The Department of Biology routinely offers scholarships to academically qualified students. The faculty review student records and award the scholarships based upon academic merit, career aspirations and other relevant attributes of the student. Scholarship recipients are then notified by mail during the spring and summer semesters. The scholarships available are:

The Archer and Mabel Fox Scholarship
The Bruce and Nancy Garlapow Memorial Scholarship
The 1929 Graduates' Bioethics Award
The Herbert Clark Mackie and Marion C. Mackie Memorial Endowment
The Alice M. Sam Biology Scholarship
The Willard F. Stanley Memorial Scholarship
The Stavrides Award for Outdoor Interests (Natural Environment)
The Adele Maytum Hunter Scholarship
The Biology Endowment Fund
The Yunghans/Mirabelli Scholarship
Michael and Marie Kaufman Yochym Biology Scholarship
Ken Mantai Scholarship Endowment
Sons of Karen West Scholarship

For additional information, see “Scholarships” on the Biology home page.
http://home.fredonia.edu/biology/scholarships

Summer Research Fellowships

The Department of Biology also sponsors a series of summer fellowships to support undergraduate and graduate research endeavors. Undergraduate and graduate students develop research project proposals under the guidance of a faculty member, and submit them to a committee for fellowship consideration. Students who are awarded fellowships perform summer research for 10 weeks under the mentorship of the faculty member, and develop and offer formal presentations to the department the following fall. The fellowships are generously endowed by:

The Holmberg Foundation Research Award
The Falcone Endowment Fund
The Constantine Barker Memorial Fund
The Dr. Robert Wettingfeld Undergraduate Research Award
The Yunghans-Dietter Research Award
The Biology Endowment Fund

For additional information, see “Summer Research Fellowships” on the Biology home page.
http://home.fredonia.edu/biology/scholarships

For information on other college scholarships, please contact the Fredonia College Foundation or the College Scholarship Committee (Office of Student Affairs).

Biology Clubs and Student Organizations

Biology Club

The Biology Club is open to all department majors, and sponsors a variety of academic and social events. Past activities have included nature hikes, white-water rafting, invasive species removals, visits to the Buffalo Museum of Science, the Buffalo Zoo, pot luck dinners, scavenger hunts, biology trivia events, movie nights, bio-olympics and a host of other activities. Faculty advisor – Dr. Jon Titus

Tri-Beta

Tri-Beta is a national biology honor society. Biology Department majors with a biology GPA of 3.00 and a cumulative GPA of 2.7 are eligible for membership. TriBeta hold local, regional and national research conferences, offers a scholarly publication (BIOS) and offers financial awards to support undergraduate research. Faculty advisor – Dr. Nicholas Quintyne

Health Professions Club

This club is open to all students interested in the health professions. Meetings enable students to meet health care professionals, learn about volunteering and internship and gain information and assistance in applying to professional programs. Faculty advisor – Dr. Ted Lee

Biology Faculty and Staff Roster

Faculty	Phone 716-673	Room/ Building	Email - @fredonia.edu	Research Interest/Curricular Interest
Ms. Patricia Astry, Biology Chair *Contact for Medical Technology & Pre-Allied Health*	3283	221/234 Science Center	patricia.astry	**Immunology/Microbiology** – Immunodiagnostics – Diagnosing infectious disease through the detection of antibodies.
Dr. Todd Backes *Contact for Exercise Science*	3362	238 Science Center	todd.backes	**Applied Human Physiology –** Study of how the physiological stress of acute and chronic exercise affects cognitive function. Study of how dehydration and fluid consumption affects exercise performance.
Dr. William Brown *Contact for Adolescence Education*	3620	132 Science Center	william.brown	**Ecology and Evolution** – Study of the ecology of cooperation and conflict in animal social groups and mating systems.
Dr. Scott Ferguson *Contact for Molecular Genetics*	4883	223 Science Center	scott.ferguson	**Molecular Biology** – The use of genetic and cell biological approaches to further our understanding of the developmental factors that pattern the Drosophila oocyte.
Dr. Frederick Harrington	4958	233 Science Center	frederick.harrington	**Physiology** – The study of the growth of green algae in varying environmental conditions and the production of biofuel precursors.
Dr. Karry Kazial	3284	124 Science Center	karry.kazial	**Animal Behavior** – Current research focuses on acoustic communication in bats and bat-insect interactions.
Dr. Jonathan Kniss	3820	230 Science Center	jonathan.kniss	**Developmental Biology –** The developing Zebrafish lateral line is used as a system to conduct genetic, molecular and cell biological experiments to better understand cell migration, organ formation and regeneration.
Dr. Theodore Lee *Contact for Pre -medicine, -dentistry, -optometry, -veterinary medicine*	3816	221/212 Science Center	Leew	**Molecular Biology** – The molecular regulation of gene expression in bacteria. Identification of bacteria by analysis of 16S rRNA gene.

Faculty	Phone 716-673	Room/ Building	Email - @fredonia.edu	Research Interest/Curricular Interest
Mr. Edward McCarrick	3815	241 Science Center	edward.mccarrick	**Instructional Support Associate**
Dr. Scott Medler	3360	229 Science Center	soctt.medler	**Vertebrate Physiology** – Skeletal muscle structure, function, and plasticity. Identification of skeletal muscle fiber types in relation to muscle function and plasticity.
Dr. Patricia Noel	3782	211 Science Center	patricia.noel	**Laboratory Coordinator and Instructor** – Introduction to Ecology and Evolution, Introduction to Cell and Molecular Biology
Mrs. Caldwell Proper	3282	221 Science Center	caldwell.proper	**Department Secretary**
Dr. Nicholas Quintyne	3821	224 Science Center	nicholas.quintyne	**Cell Biology** – Function and regulation of microtubules and microtubule-associated proteins in cellular architecture and cell cycle progression in normal and cancer cells.
Dr. Jonathan Titus	3818	133 Science Center	jonathan.titus	**Plant Biology** – Development of plant communities in primary succession.
Dr. Courtney Wigdahl-Perry	4622	237 Science Center	courtney.wigdahl	**Aquatic Ecology** - Response of lakes to environmental changes in the past and present.