

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

State University of New York at Fredonia

Fredonia, New York 14063

(716) 673-3281 <http://www.fredonia.edu/chemistry/>

Research projects in Chemistry and Biochemistry with \$4 million of state of the art research equipment is excellent preparation for careers in academia, industry and healthcare.

<i>Faculty – All faculty offer advisement for Chemistry/Biochemistry Programs; Specialty areas are listed for individual faculty.</i>	<i>Specialty Areas and Research Interests</i>
Dr. Matthew Fountain: 673-3287 matthew.fountain@fredonia.edu	<ul style="list-style-type: none">• Coordinator of the Biochemistry Program• Structure of nucleic acids and drug design• Drug candidates that targets telomeres• RNA structure that causes myotonic dystrophy, Huntington's , Parkinson's• COVID-19 RNA secondary structure and drug design• Using docking software to design drugs that bind RNA and proteins
Dr. Matthew Gronquist: 673-4842 matthew.gronquist@fredonia.edu	<ul style="list-style-type: none">• Organic and Applied Spectroscopy Instructor• Natural product identification in insects
Dr. Mark Janik: 673-3508 mark.janik@fredonia.edu	<ul style="list-style-type: none">• Organic and Advanced Organic Chemistry Instructor• Organic and General Chemistry Laboratory Instructor• Research interests are in the area of synthetic organic/medicinal chemistry.• The compound colchicine is a known antimetabolic agent. It exerts its anticancer effect by binding to the protein tubulin. This binding inhibits the polymerization of tubulin and hence stops the mitotic cycle.
Dr. Michael Milligan: 673-3500 michael.milligan@fredonia.edu	<ul style="list-style-type: none">• Environmental Chemistry, Physical Chemistry and Instrumental Analysis Instructor• Impact of In- and Out-of-State Power Plants on Semivolatile Pollutants in New York State.• Deposition and Ambient Concentrations of Semivolatile Organic Pollutants in the Lake Ontario Region.
Dr. Allan Jay Cardenas: 673-4843 Allan.cardenas@fredonia.edu	<ul style="list-style-type: none">• Inorganic, Molecular and Catalytic Chemistry• Synthesis and Characterization of Ionic Liquids• Synthesis and Characterization of New Class of Frustrated Lewis Pairs• Pendant Amine Assisted Conversion of Nitrogen Oxides
Dr. Mark Even: 673-3547 Mark.even@fredonia.edu	<ul style="list-style-type: none">• Physical Chemistry and General Chemistry Instructor• Adsorption and reactivity behavior of mussel adhesive proteins

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A TYPICAL COURSE OF STUDY FOR A BIOCHEMISTRY MAJOR (Curriculum Code Number: 0387)

Outlined below is a typical four-year program for a Biochemistry 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. 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			FRESHMAN YEAR -- SPRING		
Cr.	Course		Cr.	Course	
Hrs.	Number	Course Title	Hrs.	Number	Course Title
4	MATH 122	University Calculus I	4	BIOL 133/134	Introductory Cell and Molecular Biology & Lab
4	CHEM 115/125	General Chemistry I Lecture & Lab	4	CHEM 116/126	General Chemistry Lecture & Lab II
1	CHEM 100	Chemistry Freshman Seminar *	4	MATH 123	University Calculus II
3	FF:	ENGL 100 Craft of Writing	3	FF:	Fredonia Foundation
3	FF:	Fredonia Foundation			
15	credit hours		15	credit hours (subtotal = 30 credits)	
SOPHOMORE YEAR -- FALL			SOPHOMORE YEAR -- SPRING		
4	BIOL 237/238	Genetics Lecture & Lab	4	CHEM 216/226	Organic Chemistry II Lecture & Lab
4	CHEM 215/225	Organic Chemistry I Lecture & Lab	3	CHEM 317	Analytical Chemistry, Qualitative Analysis
4	PHYS 121/123	College Physics I Lecture & Lab	1	CHEM 327	Analytical Chemistry I Lab
3	FF:	Fredonia Foundation	4	PHYS 122/124	College Physics II Lecture & Lab
15	credit hours (subtotal = 45 credits)		3	FF:	Fredonia Foundation
			15	credit hours (subtotal = 60 credits)	
JUNIOR YEAR -- FALL			JUNIOR YEAR -- SPRING		
4	BIOL 333/334	Biochemistry Lecture & Lab	2	CHEM 465	Advanced Experimental Biochemistry Lab
3	CHEM 314/315	Principles of Physical Chemistry <i>or</i> Introduction to Physical Chemistry	3	CHEM 475	Advanced Biochemistry
3	UL	UL Liberal Arts and Sciences Elective	3	FF:	Fredonia Foundation
3	FF:	Fredonia Foundation	3	FF:	Fredonia Foundation
3	FF:	Fredonia Foundation	3	CHEM 392/492	Independent Lab Research
16	credit hours (subtotal = 76 credits)		14	credit hours (subtotal = 90 credits)	
SENIOR YEAR -- FALL			SENIOR YEAR -- SPRING		
3	BIOL 380	Cell and Molecular Biology	4	UL Elective	UL Chemistry Elective
1	CHEM 495	Seminar: Advances in Chemistry I	2	CHEM 496	Seminar: Advances in Chemistry II
3	FF:	Fredonia Foundation	3	UL	UL Liberal Arts and Sciences Elective
3	FF:	Fredonia Foundation	3	FF:	Fredonia Foundation
3	UL	UL Liberal Arts and Sciences Elective	3	UL Elective	UL Chemistry Elective
3	UL	UL Chemistry Elective			
16	credit hours (subtotal = 106 credits)		15	credit hours (subtotal = 121 credits)	

* Chemistry Freshman Seminar is not required for the Major but it is **HIGHLY** recommended for incoming freshman.

ADVISOR: _____

Student: _____

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Curriculum Checklist: B.S. Degree in BIOCHEMISTRY

(Curriculum Code: 0387)

GROUP I: COLLEGE CORE CURRICULUM - Please see separate sheet

GROUP II: CORE REQUIREMENTS FOR MAJOR IN BIOCHEMISTRY

SEMESTER
COMPLETE

COURSE NUMBER AND TITLE:	HRS	F/S	YEAR	GRADE
CHEM 115 Gen Chem I Lecture	3			
CHEM 125 Gen Chem I Lab	1			
CHEM 116 Gen Chem II Lecture	3			
CHEM 126 Gen Chem II Lab <i>or</i>				
CHEM 130 HONORS Gen Chem Lab	1			
CHEM 215 Org Chem I Lecture	3	F		
CHEM 225 Org Chem I Lab	1	F		
CHEM 216 Org Chem II Lecture	3	S		
CHEM 226 Org Chem II Lab <i>or</i>		F		
CHEM 230 Advanced Org Lab	1	S		
BIOL 133 Intro Cell & Molecular Biology Lecture	3	S		
BIOL 134 Intro Cell & Molecular Biology Lab	1	S		
BIOL 237 Genetics Lecture	3	F		
BIOL 238 Genetics Lab	1	F		
CHEM 314 Principles of Physical Chemistry <i>or</i>				
CHEM 315 Introduction to Physical Chemistry	3			
CHEM 317 Analytical Chemistry, Quantitative Analysis Lecture	3	S		
CHEM 327 Analytical Chemistry I Lab	1	S		
BIOL 380 Cell and Molecular Biology	3	S		
BIOL 333 Biochemistry Lecture	3	F		
BIOL 334 Biochemistry Lab	1	F		
CHEM 465 Adv. Exp. Biochem Lab	2	S		
CHEM 475 Advanced Biochemistry	3	S		
CHEM 495 Seminar: Advances in Chemistry I	1	F		
CHEM 496 Seminar: Advances in Chemistry II	2	S		
Upper Level Electives in Biology or Chemistry	9			
<i>Total</i>	55			

GROUP III: Additional Courses**(14-18 hours)**

COURSE NUMBER and TITLE		HRS	SEMESTER COMPLETED		GRADE
			F/S	YEAR	
MATH 120	Survey of Calculus I <i>and</i>	3			
MATH 121	Survey of Calculus II	3			
OR					
MATH 122	University Calculus I <i>and</i>	4			
MATH 123	University Calculus II	4			
PHYS 121		3			
PHYS 123		1			
AND					
PHYS 122		3			
PHYS 124		1			
OR					
PHYS 230		4			
PHYS 232		1			
AND					
PHYS 231		4			
PHYS 233		1			

Total for Major**(69-73 hours)****GROUP IV: Approved Upper-Level Electives**

COURSE NUMBER and TITLE		HRS	SEMESTER COMPLETED		GRADE
			F/S	YEAR	
Biology Electives					
BIOL 334	Parasitology	1			
BIOL 336	Mammalian Physiology Lecture	3			
BIOL 337	Mammalian Physiology Lab	1			
BIOL 338	Microbiology	4			
BIOL 381	Cell Biology Lab	1			
BIOL 435	Developmental Biology	3			
BIOL 437	Molecular Genetics Lab	2			
BIOL 438	Molecules and Medicine	3			
BIOL 440	Undergraduate Research	1-3			
BIOL 453	Basic Hematology	1			
BIOL 461	Immunology and Serology	3			
BIOL 480	Molecular Biology of Disease	3			
BIOL 450	Special Topics Course Related to Biochemistry (Chair Approved)	3			

Chemistry Electives					
CHEM 316	Advanced Physical Chemistry	3			
CHEM 318	Analytical Chemistry Instrumental Analysis	3			
CHEM 325	Physical Chemistry Lab I	1			
CHEM 326	Physical Chemistry Lab II	1			
CHEM 328	Analytical Chemistry II Lab	2			
CHEM 412	Advanced Organic Chemistry	3			
CHEM 413	Applied Spectroscopy	3			
CHEM 414	Medicinal Chemistry	3			
CHEM 417	Polymer Chemistry	3			
CHEM 462	Inorganic Chemistry	3			
CHEM 481	Special Topics Course Related to Biochemistry (Chair Approved)	3			

***No more than 3 credit hours of BIOL 440 Undergraduate Research or CHEM 391, 392, 491, and 492 Independent Lab Research can be used towards the major. CHEM 305 and BIOL 458 can not be used for upper-level credit.**

At least 3 upper-level credits must be from Chemistry.

Upper-level Biology and Chemistry courses not listed above, that are related to Biochemistry, can be used towards the Biochemistry degree, but need approval from the chair of the department.

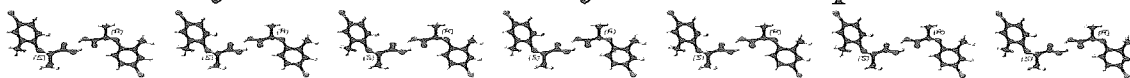
Fredonia Foundations – General Education Program
 Advising Sheet – Effective Fall 2018

COMPETENCIES			
	Course Taken	Semester Completed	Grade
Oral Communication			
Written Communication			
Mathematics & Quantitative Reasoning			
THEMES * (Two Courses in Each Area)			
1. Critical Thinking & Analysis			
2. Critical Thinking & Analysis			
1. Creative Thinking & Innovation			
2. Creative Thinking & Innovation			
1. Global Perspectives & Diversity			
2. Global Perspectives & Diversity			
CATEGORIES			
Arts			
Humanities			
Foreign Language All Fredonia students have to successfully complete a minimum of one language course (numbered 110 or above). The appropriate course level will be determined by a proficiency test in the language of the student's preference. In order to select the correct course, all incoming students must take the placement test as soon as possible in the semester prior to wanting to take a foreign language course. Students that do not have any background in the preferred language of study can choose to take the 100 level of the preferred language of study instead of the placement exam to be prepared for the 110 course. <i>Placement Exam Score: Semester Completed:</i>			
Natural Sciences			
Social Sciences			
2 from the following 3 Categories:			
American History			
Other World Civilizations			
Western Civilizations			

* Transfer students are encouraged, but not required, to complete Themes.

Entered as a transfer student with Fredonia Foundations requirement complete: YES NO

Chemistry and Biochemistry Scholarships and Awards



ROY KELLER ENDOWMENT (OUTSTANDING RESEARCH) (Awarded Spring)

- *To the student who has done outstanding research and has demonstrated dedication, as well as creative and independent thinking toward the research goal. Students are nominated by their research director and receive approximately \$150.*

DR. PHILIP KUMLER CHEMISTRY AWARD (Awarded Spring)

- *Given to the student who presents the best chemistry seminar in a given year.*

DR. ROBERT MAYTUM SCHOLARSHIP (Awarded every 3 years in Spring)

- *To be awarded to a junior or senior science student who needs help to complete degree work.*

CAROLYN RUTH MOOS CHEMISTRY SCHOLARSHIP (Awarded Fall)

- *To a promising young chemistry or biochemistry entering freshman student.*

GILBERT and RUTH MOOS AWARD (OUTSTANDING SENIOR) (Awarded Spring)

- *Presented annually each spring to the full-time chemistry major who has completed four years of college with an overall GPA of at least 3.0/4.0 and evidence of distinctive*

OUR Future Award (Outstanding Undergraduate Research) (Awarded Fall)

- *Awarded to a chemistry major, Biochemistry major, or dual major with chemistry that is actively involved in the undergraduate research program under the leadership or joint leadership of a chemistry faculty member.*

OUTSTANDING TEACHING ASSISTANT (Awarded Spring)

- *To the teaching assistant who is outstanding and receives supporting evaluations from students and staff.*

DR. JEROME H. SUPPLE MEMORIAL SCHOLARSHIP (Awarded Fall)

- *For a promising incoming chemistry major.*

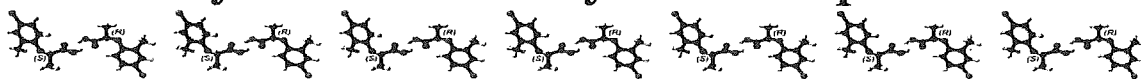
BYRON A. THUMM AWARD (ANALYTICAL CHEMISTRY AWARD) (Awarded Spring)

- *To the full-time chemistry major attaining highest grades in Analytical Chemistry (CH317-318, CH327-328), and showing other evidence of interest and potential success in analytical chemistry (research, internship, etc.).*

DOROTHY VAN VALKENBURG AWARD (SERVICE AWARD) (Awarded Spring)

- *To the student who has been outstanding in service to the department.*

Chemistry and Biochemistry Scholarships and Awards



GENERAL CHEMISTRY (Awarded Fall)

- *To a full-time student who has completed the first year at Fredonia, for outstanding achievement in General Chemistry (lecture and lab; CH115-116 and CH125-126)*

ORGANIC CHEMISTRY (Awarded Fall)

- *To the student completing the organic chemistry sequence (CH215-216, CH225-226) with strong performance as well as strong overall academic performance.*

DENNIS R. and KATHRYN L. COSTELLO SCHOLARSHIP (Awarded Fall)

- *For a full time undergraduate student majoring in either the Natural Sciences or Economics and demonstrating interest in climate change, global population control and/or environmental issues.*

DAVID DINGLEDY MEMORIAL FUND - PHYSICAL CHEMISTRY (Awarded Fall)

- *Presented annually to the student with the best overall performance in the physical chemistry sequence.*

DAVID DINGLEDY MEMORIAL FUND – SCHOLAR (Awarded Fall)

- *Best overall performance in the combined Fall and Spring semesters as determined primarily by calculation of the two semester combined GPA.*

GAVIN FAMILY SCHOLARSHIP (Awarded Fall)

- *Intended to encourage students to take an interest in research early on in their academic career.*

MARY J. MARLETTA SCHOLARSHIP (Awarded Fall)

- *To the most promising Biochemistry student applying to Fredonia.*

KELLY/KAMINSKI CHEMISTRY ACHIEVEMENT AWARD (Awarded Fall)

- *Given to a promising incoming freshman chemistry major based on his/her high school grades, an essay, and the Fredonia application.*

OUTSTANDING ALUMNI AWARD (Awarded Spring)

- *To an outstanding chemistry graduate of this department.*

RAFFAELLE BORRIELLO M.D. and SUZANNE T. CASDEN CHEMISTRY DEPARTMENT ENDOWMENT (Awarded Fall or Spring)

- *To be used to support student travel to conferences*

FRANK J. COSTANZA'S GREENHOUSE MEMORIAL FUND (Awarded Spring)

- *This is awarded to an outstanding junior or senior chemistry or biochemistry major who is working while going to school full time.*