

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY

Degrees, Tracks and Course Requirements

Effective Fall 2020

<http://bloomu.edu/chemistry>

Our Programs

The Department of Chemistry and Biochemistry is **approved** by the American Chemical Society (ACS). Students who complete certain requirements may then have their degrees **certified** by ACS.



The Biochemistry program is also **accredited** by the American Society for Biochemistry and Molecular Biology.

Degrees Offered

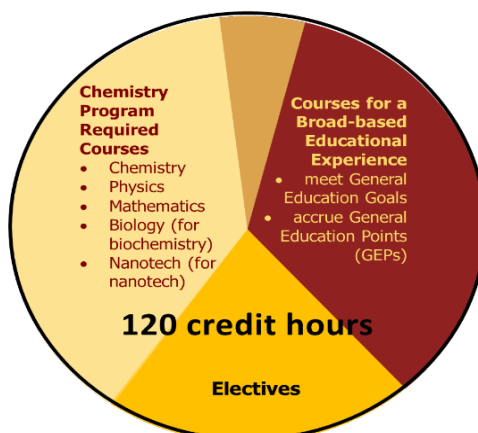
- **Bachelor of Science in Chemistry**
 - Chemistry track
 - ACS Certification Available
 - Biochemistry track
 - ACS Certification Available
 - ASBMB Certification Available
 - "4 + 4" B. S. - D. O. program with the Philadelphia College of Osteopathic Medicine (PCOM). <http://www.bloomu.edu/physician-preparation>
 - We also have an agreement with Geisinger Commonwealth School of Medicine
 - Nanotechnology track
- **Bachelor of Arts in Chemistry**
 - Also includes a "3 + 4" B.A.-D.O. program with the Philadelphia College of Osteopathic Medicine (PCOM). <http://www.bloomu.edu/physician-preparation>

No matter what degree or track you pursue the first two years of study is very much the same for all chemistry majors.

University Course Requirements

All Bloomsburg University students must earn a minimum of 120 credits, meet the course requirements of their major, and complete general education requirements for graduation. Some courses help satisfy both major and general education requirements.

Your Courses at BU



Course Requirements in the Sciences

The table below summarizes the different tracks the department offers and the required courses and electives in each.

Revised 01 Feb 2015		Chemistry Degrees and Tracks			B.A.	B.S.	B.S. ACS	B.S. Nano	B.S. Biochem	B.S. Biochem ACS
Courses				Credits	33	43	51	52	42	52
CHEM	115	Chemistry for the Sciences 1	4							
CHEM	116	Chemistry for the Sciences 2 (CHEM 115)	4							
CHEM	231	Organic Chemistry 1 (CHEM 116)	4							
CHEM	232	Organic Chemistry 2 (CHEM 231)	4							
CHEM	251	Inorganic Chemistry (CHEM 231)	3							
CHEM	281	Introduction to Chemical Literature (CHEM 231)	1							
CHEM	321	Analytical Chemistry 1 (CHEM 116)	4							
CHEM	361	Physical Chemistry 1 (CHEM116,MATH225,PHYSICS212)	4							
CHEM	322	Instrumental Analytical Chemistry (CHEM 321)	4	6 cr *			*	*		
CHEM	341	Biochemistry 1 (CHEM 232)	4		*		*			
CHEM	362	Physical Chemistry 2 (CHEM 361)	4				cr	*		
CHEM	452	Advanced Inorganic Chemistry(CHEM 362)	4	*			*	6 cr		
CHEM	492	Chemical Research 1	1-3		*		*	6	*	
CHEM	333	Advanced Organic Chemistry(CHEM 232)	3		3 cr	*	6	*	*	
CHEM	371	Introduction to Polymer Chem (CHEM 230 or 232)	3			*	*	*	*	
CHEM	482	Advanced Topics	3		*	3 cr	*	*	*	
CHEM	442	Biochemistry 2 (CHEM 341)	4			3				
CHEM	491	Independent Study	3			*				
CHEM	498	Internship in Chemistry	3			*				
CHEM	493	Chemistry Research 2	3							
GENTRANS	403	Nanotechnology Practicum 1	6							
GENTRANS	406	Nanotechnology Practicum 2	6							
GENTRANS	408	Nanotechnology Practicum 3	6							
Mathematics Courses 12 credits					12	12	12	12	12	12
MATH	125	Calculus 1	4							
MATH	126	Calculus 2 (MATH 125)	4							
MATH	225	Calculus 3 (MATH 126)	4							
Physics Courses 8 credits					8	8	8	8	8	8
PHYSICS	211	Gen Physics 1	4							
PHYSICS	212	Gen Physics 2 (PHYSICS 211, MATH 125 concur.)	4							
Biology Courses 11 Credits								11	11	
BIOLOGY	271	Cell Biology	4							
BIOLOGY	332	Genetics (BIOLOGY271)	3							
BIOLOGY	242	Microbiology	4					*	*	
BIOLOGY	333	Molecular Biology	3					3 cr		3 cr
BIOLOGY	334	Molecular Biology Lab (BIOLOGY271)	1					*	*	
BIOLOGY	343	Immunology (BIOLOGY271)	3					*	*	

When to take which course?

The table below shows a recommended plan for sequencing chemistry, physics and math courses for students starting a chemistry program in their first year. You can get a rough idea of when certain courses are taken by the first digit of the course number; 100 courses are taken in the first year, etc. Courses in normal type are required by all tracks, while those in *italics* are required in some tracks. Since there are several tracks and flexibility within those tracks, students will consult with their advisors on a regular basis to be sure they have an appropriate plan for their particular track.

Fall Year 1 CHEM 115 – Chemistry for the Sciences 1 MATH – First math course ¹ INTSTUD 100 – University Seminar Other courses	Spring Year 1 CHEM 116 - Chemistry for the Sciences 2 MATH – Second math course Other courses
Fall Year 2 CHEM 231 – Organic Chemistry 1 Offered Fall only MATH – Third math course PHYSICS 211 – General Physics 1 Other courses	Spring Year 2 CHEM 232 – Organic Chemistry 2 Offered Spring only CHEM 251 – Inorganic Chemistry Offered Spring only <i>CHEM 281 – Intro to Chemical Literature</i> Offered Spring only PHYSICS 212 – General Physics 2 MATH if necessary (Calculus 3 to be completed by this semester)
Fall Year 3 CHEM 321 ² – Analytical Chemistry 1 Offered Fall only CHEM 361 ² – Physical Chemistry 1 (Calculus 3 and Gen Phys 2 must be complete) Offered Fall only <i>CHEM 341³ – Biochemistry 1 (Requires Organic Chem 2)</i> Other courses	Spring Year 3 <i>CHEM 322² – Instrumental Analytical Chem</i> Offered Spring only <i>CHEM 362² – Physical Chemistry 2</i> Offered Spring only <i>CHEM 442² – Biochemistry 2</i> Offered Spring only Other courses
Fall Year 4 <i>CHEM 452 – Advanced Inorganic Chemistry</i> Offered Fall only Other courses	Spring Year 4 <i>Any "Spring Only" chemistry courses not previously taken</i> Other courses

Completion of the General Education Requirements

Each student must accumulate a minimum number of General Education Points (GEPs) in each of the ten General Education Goals through the above courses and other courses throughout the University.

Also see www.bloomu.edu/general_education and www.bloomu.edu/documents/mycore/GEP_Tracking.pdf

	Description	GEPs Required	GEPs Earned - Course
Goal 1	Communicate effectively in writing, oral presentation, and visual argument	7	1 - <i>Chem 341</i>
Goal 2	Find, evaluate, and ethically use information using appropriate technology	2	1 - <i>Chem 281</i>
Goal 3	Apply critical analysis, quantitative reasoning, and problem solving skills	5	1 - <i>Chem 115</i> 2 - <i>Chem 116</i> 2 - <i>MATH 125</i> 1 - <i>PHYSICS 211</i>
Goal 4	Apply knowledge from the humanities and other disciplines to analyze: the implications of diversity among human groups, their histories, cultures, and the plurality of human experiences	5	
Goal 5	Demonstrate knowledge of natural sciences principles, concepts, and methods.	5	3 - <i>Chem 115</i> 2 - <i>Chem 116</i> 1 - <i>MATH 125</i> 3 - <i>PHYSICS 211</i>

¹ Some students begin their math sequence with MATH 113 – Pre-calculus as determined by the Math Placement Exam.

² Can be deferred to 4th year, with advisement, depending on track.

³ Students not in the biochemistry track may take this anytime in the third and fourth years.

Goal 6	Demonstrate knowledge of social sciences principles, concepts, and methods	5
Goal 7	Apply knowledge from the arts and humanities to analyze, evaluate, or participate in the artistic and literary traditions of our diverse world	5
Goal 8	Demonstrate basic communication skills in a second language	2
Goal 9	Participate in physical activity and evaluate the consequences of health decisions	2
Goal 10	Exhibit responsible citizenship	2

Other Advising Notes

Getting Advice

You will have an advisor in the department whose job it is to help you with your academic plans. However, you must cooperate with your advisor so that they may help you. Cooperation involves, among other things, seeing your advisor at least once a semester before it is your time to schedule, letting your advisor know when your plans change or you think they are changing, and following your advisor's advice. You will probably look for advice from other students, BUT check things out with your advisor; the rumor mill and misinformation factories on college campuses are usually in full production and cannot be relied upon.

Transfer students can have a variety of courses and experiences before coming to BU. You should work closely with your advisor to integrate their previous coursework into the BU programs in the best way.

Writing

Never pass up the opportunity to write (or read)! Writing is important no matter what profession you may be pursuing. It is especially important if you are planning to go to graduate school or into a professional school in any of the health fields. All students are required to take ENGLISH 101 – Foundations of College Writing, and we encourage students to take INTSTUDY 231 – Technical Writing to contribute to their General Education Goal 1 (2 points) and Goal 2 (1 point). Any other courses from across the university where writing is required will put you at an advantage later on in a profession and on admissions applications.

Research

Research in some area of chemistry is required in some of our tracks. Having done research with a faculty mentor improves your credentials on job applications and in applications for graduate and professional schools. Research does not have to be done for credit, and there are opportunities to work with a professor on a volunteer basis.

Nanotechnology

The Nanotechnology track includes 18 credit hours in courses from Penn State University's Center for Nanotechnology Education and Utilization (CNEU). This may be done through a spring semester or summer residence at PSU, State College, or through on-line classes and an intense two-week residence in the summer to work in the nanotech labs and clean rooms. When and how to do the practicum is an important discussion to have with your advisor. To qualify for the Nanotechnology Practicum, a 2.0 GPA in each of the following: CHEM 115, CHEM 116, CHEM 231, CHEM 232, CHEM 321, and CHEM 361 is required. A surcharge in addition to BU tuition and fees is required.

Post-Graduate Studies

If you are thinking of academic work beyond your bachelor's degree, especially in health related field, it's never too early to look at programs and what they require. These requirements can vary quite a bit, sometimes by institution, so knowing this early will allow you to be prepared.