

Term Information

Effective Term Autumn 2017

General Information

Course Bulletin Listing/Subject Area Chemistry
Fiscal Unit/Academic Org Chemistry - D0628
College/Academic Group Arts and Sciences
Level/Career Undergraduate
Course Number/Catalog 1612
Course Title Peer-led Team Learning for Chemistry 1610 students
Transcript Abbreviation PLTL for Chem 1610
Course Description Provides a structure with which students can work actively in groups of 6 to 8 peers on challenging chemistry problems. This course will integrate with topics covered in Chemistry 1610. The activities will be challenging and relevant to course material and groups will work to discuss, collaborate and answer questions in the activity.
Semester Credit Hours/Units Fixed: 1

Offering Information

Length Of Course 14 Week
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? No
Grading Basis Satisfactory/Unsatisfactory
Repeatable No
Course Components Workshop
Grade Roster Component Workshop
Credit Available by Exam No
Admission Condition Course No
Off Campus Never
Campus of Offering Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites Concur: 1610
Exclusions Not open to students with credit for 1220 (123), 1620 (162), 1920H (202H), or 1250 (125).

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code 40.0501
Subsidy Level General Studies Course
Intended Rank Freshman

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Help students work actively on rich chemistry problems to facilitate learning of chemistry 1610 content.
- Work effectively with a diverse group of peers to solve challenging chemistry problems
- Build community among 1st year chemistry majors in the Department of Chemistry & Biochemistry

Content Topic List

- Introduction: Matter and Measurement
- Atoms, Molecules, and Ions
- Chemical Reactions and Stoichiometry
- Reactions in Aqueous Solutions
- Thermochemistry
- Electronic Structure of Atoms
- Periodic Properties of the Elements
- Basic Concepts of Chemical Bonding
- Molecular Geometry and Bonding Theories
- Gases
- Liquids and Intermolecular Forces
- Solids and Modern Materials

Attachments

- 1612 Syllabus- 022317.docx: Update Syllabus
(Syllabus. Owner: Sutherland, Laura Nicolle Romrell)
- CHEM 1612- Answers to Questions_NMS.docx: Question Answers
(Other Supporting Documentation. Owner: Sutherland, Laura Nicolle Romrell)
- BA in Biochemistry Sample Curriculum Plan.docx: BIOCHEM-BA
(Other Supporting Documentation. Owner: Sutherland, Laura Nicolle Romrell)
- BS in Biochemistry Sample Curriculum Plan.docx: BIOCHEM-BS
(Other Supporting Documentation. Owner: Sutherland, Laura Nicolle Romrell)
- BA in Chemistry Sample Curriculum Plan.docx: CHEM-BA
(Other Supporting Documentation. Owner: Sutherland, Laura Nicolle Romrell)
- BS in Chemistry Sample Curriculum Plan.docx: CHEM-BS
(Other Supporting Documentation. Owner: Sutherland, Laura Nicolle Romrell)

Comments

- See 2-6-17 feedback e-mail to T Gustafson. *(by Vankeerbergen, Bernadette Chantal on 02/06/2017 01:17 PM)*

COURSE REQUEST
1612 - Status: PENDING

Last Updated: Haddad,Deborah Moore
02/23/2017

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Sutherland,Laura Nicolle Romre	12/09/2016 01:34 PM	Submitted for Approval
Approved	Gustafson,Terry Lee	12/09/2016 01:47 PM	Unit Approval
Approved	Haddad,Deborah Moore	12/09/2016 02:57 PM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	02/06/2017 01:17 PM	ASCCAO Approval
Submitted	Sutherland,Laura Nicolle Romre	02/23/2017 12:12 PM	Submitted for Approval
Approved	Gustafson,Terry Lee	02/23/2017 12:55 PM	Unit Approval
Approved	Haddad,Deborah Moore	02/23/2017 01:38 PM	College Approval
Pending Approval	Nolen,Dawn Vankeerbergen,Bernadette Chantal Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler	02/23/2017 01:38 PM	ASCCAO Approval

How many students will the Dept be ready to accommodate? In AU16 there were 171 students enrolled in Chemistry 1610. Department might need to be ready to offer as many as 20 to 22 peer groups.

We are ready to accommodate up to 32 sections (though we only anticipate 24, based on previous enrollment). We have already worked with the registrar's office to reserve 32 small classrooms for multiple time slots on Mondays and Fridays. These classrooms are currently reserved under "CHEM 4998" but will be moved to "CHEM 1612" as soon as CHEM 1612 is formally approved.

The Dept of Chemistry should make sure that this opportunity is broadly available.

CHEM 1610 will be a co-requisite for CHEM 1612, and CHEM 1610 is the general chemistry course only taken by our majors. This course is intended to be offered to our majors only as a way to build a community in the first year. It is not intended to be broadly available to everyone.

How will students know about this course and understand that this will be valuable to them?

Once CHEM 1612 is formally approved, we have plans to write a [CBC Undergrad blog post](#), which will be highlighted in our Undergraduate Digest sent to all current majors and incoming majors. We piloted an opt-in PLTL program for CHEM 1610 last semester, and over 25% of the students chose to participate (n=48), so this blog post can include positive testimonials from these students.

Our advisors will also highlight this new PLTL program as they are meeting with prospective students and during freshman scheduling orientations. Lastly, we intend to include mention of this course in the department welcome letter which we will send out in March to all prospective first year chemistry and biochemistry students.

How are peer-leaders trained, assessed, and perhaps compensated?

We have a PLTL coordinator who is responsible for the training and assessment of our Peer-Leaders. Our Peer-leaders attend one week of training at the start of the semester, and then meet weekly with our PLTL coordinator in order to receive on-going training on the week's activities.

Our department receives over 100 applications each semester from students that want to serve as Lab Teaching Assistants for our General Chemistry courses, and although many are highly qualified, we only hire 50-60 TAs each semester due to current demand and the applicants' schedules. Through a combination of this existing hiring pool and active recruiting of additional peer leaders from the previous year's CHEM 1610/1620 students, we already have a robust pool of applicants. Applications are reviewed by the PLTL Coordinator and Dr. Terry Gustafson, Vice Chair of Undergraduate Studies. Peer leaders are paid \$12/hr and work approximately 3 hours per week (1 hr- training each week; 1.5 hrs- leading session with students, .5 hr- weekly reflection).

Update disability services statement. The Office of Student Life Disability Services has moved and the College's preferred statement is now, "Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614-292-3307, slds@osu.edu; slds.osu.edu."

This change has been made. The new syllabus has been uploaded to curriculum.osu.edu.

Will the addition of this one credit course lead to chemistry and biochemistry majors needing to take over 18 credit hours per semester?

No. A one credit course is able to be added to be added to the first year of the CHEM-BA, CHEM-BS, BIOCHEM-BA, and BIOCHEM-BS. Updated program major sheets are enclosed as curriculum.osu.edu attachments.

CHEMISTRY 1612 – AUTUMN 2017



THE OHIO STATE
UNIVERSITY

Peer-led Team Learning for CHEM1610

1-credit hour, S/U graded

Mandatory corequisite: Chemistry 1610

Course Instructor: Dr. Faculty **Office:** **Email:**

PLTL Coordinator: Dr. Rebecca Ricciardo Office: 120B Celeste Lab Email: ricciardo.10@osu.edu

Peer Leader: As assigned

Workshop meetings: Once weekly for 1.5 hours, rooms as assigned

Required Materials: The course materials will be provided at the Workshop and through Carmen. The Chemistry 1610 textbook (Chemistry, The Central Science (13th Ed), Brown, LeMay, Bursten, Murphy, Woodward, & Stoltzfus) is strongly recommended. This textbook can be acquired at the OSU Bookstore.

Course Description: The Chemistry 1612 course provides a structure with which students can work actively in groups of 6 to 8 peers on challenging chemistry problems. This course will integrate with topics covered in Chemistry 1610. Workshops include groups of students discussing and solving challenging chemistry problems related to material covered in Chemistry 1610.

Activities for the workshops will be written and provided by the PLTL coordinator. The activities will be challenging and relevant to course material and groups will work to discuss, collaborate and answer questions in the activity. No answer keys will be provided, as groups are expected to reach consensus through thoughtful discussion. Workshops are not a recitation time, not extra teaching time nor a time for exam reviews. Students are expected to attend and participate in all Workshops using the activities provided. Workshops will meet weekly and peer leaders will facilitate groups.

Peer leaders are students that have successfully and recently completed chemistry 1610 and 1620 at Ohio State. Peer leaders are trained and meet weekly outside of the Workshops to learn how to properly facilitate activities. Peer leaders work to encourage groups to work together to solve problems. Peer leaders are not there to give answers, are not tutors, teachers nor recitation instructors. Rather their role is to facilitate group discussion and collaboration.

Course Goals: The goals of this course are meant to compliment the goals of the corequisite course Chemistry 1610.

- To help students work actively on rich chemistry problems to facilitate learning of chemistry 1610 content.
- Work effectively with a diverse group of peers to solve challenging chemistry problems.
- To build community among 1st year chemistry majors in the Department of Chemistry & Biochemistry.

Participation and Attendance: The main purpose of this course is to promote scientific reasoning through active learning. The active learning sessions happen through group discussion

and thus it is imperative that all students attend each Workshop and participate fully. Points will be awarded for participation and attendance. Students will receive full credit (10 points) for attending and participating in a weekly Workshop. Participate is defined as actively engaging in discussion with peers. Peer leaders will assess participation for group members. Students will receive half credit (5 points) for attending but not participating in a weekly Workshop. Students will receive no credit (0 points) for not attending a weekly Workshop.

Course Points:

12 Workshops at 10 points each for a total of 120 points.

Course Grade: This course will be graded Satisfactory/Unsatisfactory (S/U). Students must attend at least 75% of the Workshops earning a minimum of 75% of the points possible (90 points out of 120 points) in order to receive a Satisfactory (S) grade.

Course Content Structure: The content for the Workshops will follow closely with the content covered in Chemistry 1610. An outline of topics is listed below.

Workshop Topics

Chapter 1	Introduction: Matter and Measurement (1.1-1.6): The study of chemistry; classifications of matter; properties of matter; units of measurement; uncertainty in measurement; dimensional analysis
Chapter 2	Atoms, Molecules, and Ions (2.1-2.9): Atomic theory of matter; discovery of atomic structure; modern view of atomic structure; atomic weights; periodic table; molecules & molecular substances; ions & ionic compounds; naming compounds
Chapter 3	Chemical Reactions and Stoichiometry (3.1-3.7): Chemical equations; simple patterns of chemical reactivity; formula weights; Avogadro's number & the Mole; empirical formulas from analyses; Quantitative information from balanced equations; limiting reactants
Chapter 4	Reactions in Aqueous Solutions (4.1-4.6): General properties of aqueous solutions; precipitation reactions acids, bases & neutralization reactions; oxidation-reduction reactions; Concentrations of solutions; solution stoichiometry & chemical analysis
Chapter 5	Thermochemistry (5.1-5.8): Energy; The first law of Thermodynamics; enthalpy; enthalpies of reaction; calorimetry; Hess's Law; enthalpies of formation; foods and fuels
Chapter 6	Electronic Structure of Atoms (6.1-6.9): Wave nature of light; quantized energy & photons; line spectra & the Bohr model; wave behavior of matter; quantum mechanics & atomic orbitals; representations of orbitals; Many-electron atoms; electron configuration; electron configuration & the periodic table
Chapter 7	Periodic Properties of the Elements (7.1-7.8): Development of the periodic table; effective nuclear charge; size of atoms & ions; ionization energies; electron affinity; metals, nonmetals & metalloids; trends for group 1A & 2A metals; trends for selected nonmetals
Chapter 8	Basic Concepts of Chemical Bonding (8.1-8.8): Lewis symbols & the octet rule; ionic bonding; covalent bonding; bond polarity & electronegativity; drawing Lewis structures; resonance structures; exceptions to the octet rule; strength & length of covalent bonds
Chapter 9	Molecular Geometry and Bonding Theories (9.1-9.8): Molecular shapes; VSEPR model; molecular shape & molecular polarity; covalent bonding & orbital overlap; hybrid orbitals; multiple bonds; molecular orbitals; period 2 diatomic molecules
Chapter 10	Gases (10.1-10.9): Characteristics of gases; pressure; the gas laws; the ideal-gas equation; gas mixtures & partial pressures; kinetic-molecular theory of gases; molecular effusion & diffusion; real gases: deviation from ideal behavior
Chapter 11	Liquids and Intermolecular Forces (11.1-11.8): A molecular comparison of gases, liquids & solids; intermolecular forces; select properties of liquids; phase changes; vapor pressure; Phase diagrams; liquid crystals

Disability Services (SLDS): Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614-292-3307, slds@osu.edu; slds.osu.edu.

Commitment to Diversity: The Department of Chemistry and Biochemistry promotes a welcoming and inclusive environment for all students and staff, regardless of race, gender, ethnicity, national origin, disability or sexual orientation. There is no tolerance for hateful speech or actions. All violations of this policy should be reported to the OSU Bias Assessment and Response Team (BART, studentaffairs.osu.edu/bias). The Department encourages diversity at all levels, particularly among the next generation of scientists. Students are encouraged to participate in organizations that provide support specifically for science and engineering students who are African-American, Asian, disabled, Hispanic, LGBTQ or women. These organizations are listed on the Colleges of Arts and Sciences (artsandsciences.osu.edu/stem-organizations) and Engineering (engineering.osu.edu/studentorgs) websites.

Violations of academic standards in General Chemistry will be referred to the University Committee of Academic Misconduct (COAM) as required by Faculty Rules. It is the responsibility of COAM to investigate all reported cases of student academic misconduct; illustrated by, but not limited to, cases of plagiarism and any dishonest practices in connection with examinations, quizzes, and graded assignments. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information see the Code of Student Conduct: http://studentaffairs.osu.edu/pdfs/csc_12-31-07.pdf



The Bachelor of Arts Degree in Chemistry (B.A.)

The Bachelor of Arts curriculum is intended for students who want a background in Chemistry as a basis for future work in other areas of science, such as the life sciences, or in professional areas such as medicine, pharmacy or veterinary science.

- General Chemistry 1610–1620 and Organic Chemistry 2610–2620 are the recommended sequences for chemistry and biochemistry majors, although qualified students are urged to take Honors sequences instead.
- Chemistry 1612 & 1622 are highly recommended. They provide a structure in which students can work actively in groups of 6 to 8 peers to enhance learning.
- The major is completed with **nine (9) hours of advanced science electives**, which must include **at least three (3) hours of upper level chemistry or biochemistry coursework**.

Examples of some approved science electives include:

- | | |
|--|---|
| • Chem 3510 (Inorganic - 3) | • Microbiology 4000 (4) |
| • Chem or Biochem 4998/4999 (Research) | • Molecular Genetics 4500 (3) |
| • Chem 5420 (Organic Spectroscopy - 1.5) | • Most 2000-4000 level courses in Mathematics |
| • Chem 5430 (Carbohydrates - 3) | • Other non-required graded Chem and Biochem 4000-6000 level courses |
| • Chem 5440 (Computational - 3) | • Approved 4000-6000 level courses in Microbiology, Molecular Genetics, Physics, Food Science, and EEOB |
| • Chem 5520 (Nanotechnology - 3) | |
| • Biochemistry 4511 (4) | |

- Undergraduate Research (Chem or Biochem 4998/4999) is recommended. A maximum of six (6) hours of research may be used to fulfill the requirements of the major.

Autumn Semester (Year 1)		Spring Semester (Year 1)	
General Chemistry 1 (1910H, 1610, 1210)	5	General Chemistry 2 (1920H, 1620, 1220)	5
PLTL in Gen Chem (1612)	1	PLTL in Gen Chem (1622)	1
Calculus 1 (Math 1151)	5	Calculus 2 (Math 1152)	5
GE Elective	3-4	GE Elective (<i>Biology 1113</i>)	4
Freshman Survey	1	GE Elective	3
	<hr/> 15-16		<hr/> 18
Autumn Semester (Year 2)		Spring Semester (Year 2)	
Analytical Chemistry 1 (2210)	5	Organic Chemistry 2 (2920H, 2620, 2520)	4
Organic Chemistry 1 (2910H, 2610, 2510)	4	Organic Chemistry Laboratory 2 (2550)	2
Organic Chemistry Laboratory 1 (2540)	2	Physics 2 (1201 or 1251)	5
Physics 1 (1200 or 1250)	5	GE Elective	3
	<hr/> 16		<hr/> 14
Autumn Semester (Year 3)		Spring Semester (Year 3)	
Physical Chemistry 1 (Biochem 5721)	3	Physical Chemistry 2 (Biochem 5722)	3
Advanced Science Elective (Chem/Biochem)	3-4	Physical Chemistry Laboratory (4410)	3
Elective	3	Elective	3
GE Elective	4	GE Elective	4
GE Elective	3	GE Elective	3
	<hr/> 16-17		<hr/> 16
Autumn Semester (Year 4)		Spring Semester (Year 4)	
Advanced Science Elective	3	Advanced Science Elective	3
Elective	3	Elective	3
Elective	3	GE Elective	3
GE Elective	3-4	GE Elective	3
	<hr/> 12-13	GE Elective	<hr/> 3
			15

The Bachelor of Science Degree in Chemistry (B.S.)



The Bachelor of Science curriculum is designed for students seeking to become professional chemists.

- General Chemistry 1610–1620 and Organic Chemistry 2610–2620 are the recommended sequences for chemistry and biochemistry majors, although qualified students are urged to take Honors sequences instead.
- Chemistry 1612 & 1622 are highly recommended. They provide a structure in which students can work actively in groups of 6 to 8 peers to enhance learning.
- The major is completed with **six (6) hours of advanced science electives**, which must include **at least three (3) hours of upper level chemistry or biochemistry coursework**.

Examples of some approved science electives include:

- | | |
|--|--|
| • Chem or Biochem 4998/4999 (Research) | • Biochemistry 4511 (4) |
| • Chem 5420 (Organic Spectroscopy - 1.5) | • Most 4000 or 5000 level courses in Physics |
| • Chem 5430 (Carbohydrates - 3) | • Most 4000 or 5000 level courses in Mathematics |
| • Chem 5440 (Computational - 3) | • Other non-required graded Chem and Biochem 4000-6000 level courses |
| • Chem 5520 (Nanochemistry - 3) | |

- Undergraduate Research (Chem or Biochem 4998/4999) is recommended. A maximum of six (6) hours of research may be used to fulfill the requirements of the major.
- Students who wish to receive an American Chemical Society certified degree should include Biochemistry 4511 or 5613 and an advanced laboratory experience in Inorganic Chemistry (4550) or Biochemistry (5621).

Autumn Semester (Year 1)		Spring Semester (Year 1)	
General Chemistry 1 (1910H, 1610, 1210)	5	General Chemistry 2 (1920H, 1620, 1220)	5
PLTL in Gen Chem (1612)	1	PLTL in Gen Chem (1622)	1
Calculus 1 (Math 1151)	5	Calculus 2 (Math 1172)	5
GE Elective	3-4	GE Elective (<i>e.g. Biological Science</i>)	4
Freshman Survey	1	GE Elective	3
	14-15		17

Autumn Semester (Year 2)		Spring Semester (Year 2)	
Organic Chemistry 1 (2910H, 2610, 2510)	4	Organic Chemistry 2 (2920H, 2620, 2520)	4
Organic Chemistry Laboratory 1 (2540)	2	Organic Chemistry Laboratory 2 (2550)	2
Physics 1, calculus based (1250)	5	Physics 2, calculus based (1251)	5
Integrals & Differential Equations (Math 2177)	4	Analytical Chemistry 1 (2210H, 2210)	5
	15		16

Autumn Semester (Year 3)		Spring Semester (Year 3)	
Physical Chemistry 1 (4300)	3	Physical Chemistry 2 (4310)	3
Inorganic Chemistry (3510)	3	Physical Chemistry Laboratory (4410)	3
Advanced Science Elective (Chem/Biochem ^a)	3-4	Analytical Chemistry 2: Instrumental Analysis (4870)	3
Elective	3	Adv. Lab (Chem 4998/Inorg. 4550/Biochem 5621 ^a)	2-4
GE Elective	3	GE Elective	4
	15-16		15-17

Autumn Semester (Year 4)		Spring Semester (Year 4)	
Advanced Science Elective	3	Elective	3
Laboratory Practice in Instrumental Analysis (4880)	2	GE Elective	3
GE Elective	3	GE Elective	3
GE Elective	3	GE Elective	3
GE Elective	3-4	GE Elective	3-4
	14-15		15-16

^aBiochemistry 4511 & Biochemistry 5621 = 4 credit hours



The Bachelor of Arts Degree in Biochemistry (B.A.)

The Bachelor of Arts curriculum is designed for students seeking to enter professional programs such as Medicine, Veterinary Medicine, Optometry, or Pharmacy.

- Chemistry 1610–1620 and Organic Chemistry 2610 – 2620 are the recommended sequences for chemistry and biochemistry majors, although qualified students are urged to take the Honors sequences.
- Chemistry 1612 & 1622 are highly recommended. They provide a structure in which students can work actively in groups of 6 to 8 peers to enhance learning.
- Undergraduate Research (Biochemistry 4998/4999) is strongly recommended as an elective course.

Autumn Semester (Year 1)		Spring Semester (Year 1)	
General Chemistry 1 (1910H, 1610, 1210)	5	General Chemistry 2 (1920H, 1620, 1220)	5
PLTL in Gen Chem (1612)	1	PLTL in Gen Chem (1622)	1
Calculus 1 (Math 1151)	5	Calculus 2 (Math 1152)	5
GE Elective	3	Introductory Biology 1 (Bio 1113)	4
Freshman Survey	1	GE Elective (e.g. <i>English 1110</i>)	3
	<u>16</u>		<u>18</u>
Autumn Semester (Year 2)		Spring Semester (Year 2)	
Organic Chemistry 1 (2910H, 2610, 2510)	4	Organic Chemistry 2 (2920H, 2620, 2520)	4
Organic Chemistry Laboratory 1 (2540)	2	Organic Chemistry Laboratory 2* (2550)	2
GE Elective	3	Biochemistry 1 (5613)	3
GE Elective	3	GE Elective	3
GE Elective (e.g. <i>Foreign Language 1101</i>)	4	GE Elective (e.g. <i>Foreign Language 1102</i>)	4
	<u>16</u>		<u>16</u>
Autumn Semester (Year 3)		Spring Semester (Year 3)	
Introductory Physics 1 (1250)	5	Introductory Physics 2 (1251)	5
Introductory Biology 2 (Bio 1114)	4	Biochemistry 3 (5615)	3
Biochemistry 2 (5614)	3	Biochemistry Lab (5621)	4
GE Elective (e.g. <i>Foreign Language 1103</i>)	4	GE Elective	3
	<u>16</u>		<u>15</u>
Autumn Semester (Year 4)		Spring Semester (Year 4)	
Physical Biochemistry 1 (5721)	3	Elective or Undergraduate Research (4998)	2-3
Molecular Genetics (MolGen 4500 or 4606)	3-4	Elective	3
GE Elective	3	Elective	3
GE Elective	3	Elective	3
Elective or Undergraduate Research (4998)	1-4	Elective	3
	<u>13-17</u>		<u>14-15</u>

NOTE: Classes listed in **BOLD** are only offered in those semesters – Autumn or Spring ONLY as shown.

There is some flexibility in course scheduling– please see an undergraduate Biochemistry advisor for more information.

Total Credit Hour Summary: minimum 31-32 semester hours in the major (121 minimum total semester hours). The Data Analysis GE Elective is covered by taking Math 1152. There are 39 upper division hours required of which 31-32 hours are encompassed in the major.

* The Organic Lab 2 is not required for the B.A., however, it is commonly used to fulfill the 2 required elective hours.



The Bachelor of Science Degree in Biochemistry (B.S.)

The Bachelor of Science curriculum is designed for students seeking to become professional biochemists or enter biotechnology fields.

- Chemistry 1610–1620 and Organic Chemistry 2610 – 2620 are the recommended sequences for chemistry and biochemistry majors, although qualified students are urged to take the Honors sequences.
- Chemistry 1612 & 1622 are highly recommended. They provide a structure in which students can work actively in groups of 6 to 8 peers to enhance learning.
- Undergraduate Research (Biochemistry 4998/4999) is strongly recommended as an elective course.

Autumn Semester (Year 1)		Spring Semester (Year 1)	
General Chemistry 1 (1910H, 1610, 1210)	5	General Chemistry 2 (1920H, 1620, 1220)	5
PLTL in Gen Chem (1612)	1	PLTL in Gen Chem (1622)	1
Calculus 1 (Math 1151)	5	Calculus 2 (Math 1152)	5
GE Elective	3	Introductory Biology 1 (Bio 1113)	4
Freshman Survey	1	GE Elective (e.g. <i>English 1110</i>)	3
	15		18
Autumn Semester (Year 2)		Spring Semester (Year 2)	
Organic Chemistry 1 (2910H, 2610, 2510)	4	Organic Chemistry 2 (2920H, 2620, 2520)	4
Organic Chemistry Laboratory 1 (2540)	2	Organic Chemistry Laboratory 2 (2550)	2
Calculus 3 (Math 2153)	4	Biochemistry 1 (5613)	3
GE Elective	3	GE Elective	3
GE Elective (e.g. <i>Foreign Language 1101</i>)	4	GE Elective (e.g. <i>Foreign Language 1102</i>)	4
	17		16
Autumn Semester (Year 3)		Spring Semester (Year 3)	
Introductory Physics 1 (1250)	5	Introductory Physics 2 (1251)	5
Introductory Biology 2 (Bio 1114)	4	Biochemistry 3 (5615)	3
Biochemistry 2 (5614)	3	Biochemistry Lab (5621)	4
GE Elective (e.g. <i>Foreign Language 1103</i>)	4	GE Elective	3
	16		15
Autumn Semester (Year 4)		Spring Semester (Year 4)	
Physical Biochemistry 1 (5721)	3	Physical Biochemistry 2 (5722)	3
Molecular Genetics (MolGen 4500 or 4606)	3-4	Elective or Undergraduate Research (4998)	1-3
GE Elective	3	Elective	3
GE Elective	3	Elective	3
Elective or Undergraduate Research (4998)	1-4	Elective	3
	13-17		13-15

NOTE: Classes listed in **BOLD** are only offered in those semesters – Autumn or Spring ONLY as shown.

There is some flexibility in course scheduling– please see an undergraduate Biochemistry advisor for more information.

Total Credit Hour Summary: minimum 38-39 semester hours in the major (121 minimum total semester hours).