Medicinal Chemistry BS

Overview

The **Bachelor of Science in Medicinal Chemistry**, offered by the Department of Chemistry, provides a focused academic pathway for students aspiring to work in the growing fields of drug discovery, pharmaceutical development, and biomedical innovation. This program is designed to meet the increasing demand for chemists trained in organic synthesis, pharmacology, and related disciplines, ensuring students are equipped with the skills and knowledge required by the pharmaceutical and biotechnology industries.

Campus Location: Main

Program Code: ST-MDCH-BS

Distinction in Major

To graduate with distinction in this major, a student must have a minimum 3.33 GPA in all the Chemistry courses required for the major.

Undergraduate Contact Information

Ann Valentine, Chair
Beury Hall, Room 130
215-204-7118
ann.valentine@temple.edu

Michael Zdilla, Vice Chair
SERC, Room 656
215-204-7866
michael.zdilla@temple.edu

Steven Fleming, Faculty Advisor (Last names A-C)
Beury Hall, Room 446
215-204-0359
sfleming@temple.edu

Elizabeth Cerkez, Faculty Advisor (Last names D-G) and Undergraduate Research Coordinator (Spring)
Beury Hall, Room 222C
215-204-7821
cerkez@temple.edu

Daniele Ramella, Faculty Advisor (Last names H-K) and Undergraduate Research Coordinator (Fall)
Beury Hall, Room 126B
215-204-1931
daniele.ramella@temple.edu

Jonathan Smith, Faculty Advisor (Last names L-M)
Beury Hall, Room 213
215-204-2252
jmsmith1@temple.edu

Robert Levis, Faculty Advisor (Last names N-R)
Beury Hall, Room 244
215-204-5241
robert.levis@temple.edu

Vladi Wilent, Faculty Advisor (Last names S-T)
Beury Hall, Room 344
215-204-7186
vladi.wilent@temple.edu

Graham Dobereiner, Faculty Advisor (Last names U-Z)
Beury Hall, Room 342
215-204-3185
dob@temple.edu

These requirements are for students who matriculated in academic year 2026-2027. Students who matriculated prior to fall 2026 should refer to the Archives *to view the requirements for their Bulletin year.*

Bachelor of Science Requirements

Summary of Requirements for the Degree

1. University Requirements (123 total s.h.)
   - Students must complete all University requirements including those listed below.
   - All undergraduate students must complete at least two writing-intensive (WI) courses for a total of at least six credits at Temple as part of their major. The specific writing-intensive courses for this major are:

Code	Title	Credit Hours
CHEM 2096	Communicating in Chemistry (WI)	2
CHEM 4196	Instrumental Analysis (WI)	5

   - Students must complete the General Education (GenEd) requirements.
     - See the General Education section of the *Undergraduate Bulletin* for the GenEd curriculum.
     - Students who complete CST majors receive a waiver for 2 Science & Technology (GS) and 1 Quantitative Literacy (GQ) GenEd courses.
   - Students must satisfy general Temple University residency requirements.
2. College Requirements
   - A minimum of 90 total credits within the College of Science & Technology (CST), the College of Liberal Arts (CLA), and/or the College of Engineering (ENG).
     - A minimum of 45 of these credits must be upper-level (courses numbered 2000 and above).
     - A minimum of 6 of these credits must be upper-level (courses numbered 2000 and above) CLA credits.
   - Successful completion or waiver from the second level of a foreign language.
   - Complete a one-credit first-year or transfer seminar.
     - SCTC 1001 CST First-Year Seminar for every entering first-year CST student.
     - SCTC 2001 CST Transfer Seminar for every entering transfer CST student.
3. Major Requirements for Bachelor of Science (72-75 s.h.)
   At least 7 courses required for the major must be completed at Temple. At least 5 Chemistry courses must be completed at Temple.

Code	Title	Credit Hours
Chemistry		
Select one of the following:		4
CHEM 1031 & CHEM 1033	General Chemistry I and General Chemistry Laboratory I	
CHEM 1951 & CHEM 1953	Honors General Chemical Science I and Honors Chemical Science Laboratory I (F)	
Select one of the following:		4
CHEM 1032 & CHEM 1034	General Chemistry II and General Chemistry Laboratory II	
CHEM 1952 & CHEM 1954	Honors General Chemical Science II and Honors Chemical Science Laboratory II (S)	
Select one of the following:		4
CHEM 2201 & CHEM 2203	Organic Chemistry I and Organic Chemistry Laboratory I	
CHEM 2211 & CHEM 2213	Organic Chemistry for Majors I and Organic Majors Laboratory I (F)	
CHEM 2921 & CHEM 2923	Organic Chemistry for Honors I and Organic Honors Laboratory I (F)	
Select one of the following:		4
CHEM 2202 & CHEM 2204	Organic Chemistry II and Organic Chemistry Laboratory II	
CHEM 2212 & CHEM 2214	Organic Chemistry for Majors II and Organic Majors Laboratory II (S)	
CHEM 2922 & CHEM 2924	Organic Chemistry for Honors II and Organic Honors Laboratory II (S)	

CHEM 2096	Communicating in Chemistry (WI)	2
CHEM 3103 & CHEM 3105	Analytical Chemistry and Analytical Chemistry Lab	4
CHEM 3405	Physical Chemistry of Biomolecules	3
CHEM 4196	Instrumental Analysis (WI)	5
CHEM 4204	Medicinal Chemistry	3
CHEM 4207	Synthesis and Identification of Organic and Medicinal Compounds	4
CHEM 4401	Biochemistry I	3
One Advanced Chemistry course - select from the following: [1]		2 to 4
CHEM 3001	Inorganic Chemistry	
CHEM 3301	Physical Chemistry Lecture I (F)	
CHEM 3302	Physical Chemistry Lecture II (S)	
CHEM 3303	Physical Chemistry Laboratory I (S)	
All other Chemistry courses numbered 4002 and above		
Medicinal Chemistry Elective		3 to 4
CHEM 3881	Cooperative Research [2]	
CHEM 3891	Undergraduate Research [2]	
CHEM 4107	Drug Analysis	
CHEM 4201	Organic Structure and Mechanisms	
CHEM 4202	Organic Synthesis Methodology	
CHEM 4407	Biotransformation of Drugs and Xenobiotics	
CHEM 4881	Cooperative Research [2]	
CHEM 4891	Undergraduate Research [2]	
Biology		
BIOL 1111	Introduction to Organismal Biology	4
or BIOL 1911	Honors Introduction to Organismal Biology	
Select one of the following:		4
BIOL 1112	Introduction to Biomolecules, Cells and Genomes	
or BIOL 1912	Honors Introduction to Biomolecules, Cells and Genomes	
BIOL 2112	Introduction to Cellular and Molecular Biology	
or BIOL 2912	Honors Introduction to Cellular and Molecular Biology	
College of Science and Technology		
SCTC 1013	Elements of Data Science for the Physical and Life Sciences	3
Mathematics		
MATH 1041	Calculus I	4
or MATH 1941	Honors Calculus I	
MATH 1042	Calculus II	4
or MATH 1942	Honors Calculus II	
Physics		
Select one of the following:		4
PHYS 1061	Elementary Classical Physics I	
or PHYS 1961	Honors Elementary Classical Physics I	
PHYS 2021	General Physics I (F)	
or PHYS 2921	Honors General Physics I	
Select one of the following:		4
PHYS 1062	Elementary Classical Physics II	
or PHYS 1962	Honors Elementary Classical Physics II	
PHYS 2022	General Physics II (S)	
or PHYS 2922	Honors General Physics II	
Total Credit Hours		**72-75**

Code	Title	Credit Hours
(F) - Fall only course		
(S) - Spring only course		

1 CHEM 4881 and CHEM 4891 will not fulfill an Advanced Chemistry elective for the Medicinal Chemistry BS degree.

2 The Medicinal Chemistry Elective, for a total of 4 credits, may be satisfied by a total of 4 credits of any combination of CHEM 2891, CHEM 3881, CHEM 3891, CHEM 4881, or CHEM 4891. No more than 1 credit of CHEM 2891 may be used toward this total.

Suggested Academic Plan

Bachelor of Science in Medicinal Chemistry

Suggested Plan for New Students Starting in the 2026-2027 Academic Year

Year 1		
Fall		**Credit Hours**
Select one of the following:		4
CHEM 1031 & CHEM 1033	General Chemistry I and General Chemistry Laboratory I	
CHEM 1951 & CHEM 1953	Honors General Chemical Science I and Honors Chemical Science Laboratory I (F)	
MATH 1041 or MATH 1941	Calculus I or Honors Calculus I	4
SCTC 1001	CST First-Year Seminar	1
SCTC 1013	Elements of Data Science for the Physical and Life Sciences	3
ENG 0802 or ENG 0812 or ENG 0902	Analytical Reading and Writing [GW] or Analytical Reading and Writing: ESL [GW] or Honors Analytical Reading and Writing [GW]	4
	Credit Hours	**16**
Spring		
BIOL 1111 or BIOL 1911	Introduction to Organismal Biology or Honors Introduction to Organismal Biology	4
Select one of the following:		4
CHEM 1032 & CHEM 1034	General Chemistry II and General Chemistry Laboratory II	
CHEM 1952 & CHEM 1954	Honors General Chemical Science II and Honors Chemical Science Laboratory II (S)	
MATH 1042 or MATH 1942	Calculus II or Honors Calculus II	4
IH 0851 or IH 0951	Intellectual Heritage I: The Good Life [GY] or Honors Intellectual Heritage I: The Good Life [GY]	3
	Credit Hours	**15**
Year 2		
Fall		
Select one of the following:		4
BIOL 1112 or BIOL 1912	Introduction to Biomolecules, Cells and Genomes or Honors Introduction to Biomolecules, Cells and Genomes	
BIOL 2112 or BIOL 2912	Introduction to Cellular and Molecular Biology or Honors Introduction to Cellular and Molecular Biology	
Select one of the following:		4
CHEM 2201 & CHEM 2203	Organic Chemistry I and Organic Chemistry Laboratory I	
CHEM 2211 & CHEM 2213	Organic Chemistry for Majors I and Organic Majors Laboratory I (F)	

CHEM 2921 & CHEM 2923	Organic Chemistry for Honors I and Organic Honors Laboratory I (F)	
Select one of the following: [3]		4
PHYS 1061	Elementary Classical Physics I	
PHYS 1961	Honors Elementary Classical Physics I (F)	
PHYS 2021	General Physics I (F)	
PHYS 2921	Honors General Physics I (F)	
IH 0852 or IH 0952	Intellectual Heritage II: The Common Good [GZ] or Honors Intellectual Heritage II: The Common Good [GZ]	3
	Credit Hours	**15**
Spring		
Select one of the following:		4
CHEM 2202 & CHEM 2204	Organic Chemistry II and Organic Chemistry Laboratory II	
CHEM 2212 & CHEM 2214	Organic Chemistry for Majors II and Organic Majors Laboratory II (S)	
CHEM 2922 & CHEM 2924	Organic Chemistry for Honors II and Organic Honors Laboratory II (S)	
Select one of the following: [3]		4
PHYS 1062	Elementary Classical Physics II	
PHYS 1962	Honors Elementary Classical Physics II (S)	
PHYS 2022	General Physics II (S)	
PHYS 2922	Honors General Physics II (S)	
CHEM 2096	Communicating in Chemistry [WI]	2
GenEd Breadth Course		3
Elective		2
	Credit Hours	**15**
Year 3		
Fall		
CHEM 3103	Analytical Chemistry [1]	3
CHEM 3105	Analytical Chemistry Lab [1]	1
CHEM 4204	Medicinal Chemistry	3
GenEd Breadth Course		3
Elective		3
Elective		3
	Credit Hours	**16**
Spring		
CHEM 4401	Biochemistry I	3
CHEM 3405	Physical Chemistry of Biomolecules	3
GenEd Breadth Course		3-4
Elective		3
Elective		4-3
	Credit Hours	**16**
Year 4		
Fall		
CHEM 4196	Instrumental Analysis [WI]	5
Advanced Chemistry Course [2]		2-4
GenEd Breadth Course		3
Elective		1-0
Elective		3-2
	Credit Hours	**14**
Spring		
CHEM 4207	Synthesis and Identification of Organic and Medicinal Compounds	4

Medicinal Chemistry Elective [3]	3-4
GenEd Breadth Course	3
Elective	3
Elective	3-2
Credit Hours	**16**
Total Credit Hours	**123**

1 It is strongly encouraged that CHEM 3103/CHEM 3105 be taken prior to any laboratory courses numbered above CHEM 3105.

2 Advanced Chemistry Courses for BS students consist of CHEM 3001, CHEM 3301, CHEM 3302, CHEM 3303 and all courses in Chemistry having a number of 4002 or above. If the student has successfully completed the appropriate prerequisite course, a graduate course in Chemistry may be included in this category.

3 Select from the Medicinal Chemistry Elective List from requirements.

Code	Title	Credit Hours
(F) - Fall only course		
(S) - Spring only course		