

# Chemistry Major

(BSChem degree)

University of Michigan - Department of Chemistry

Chemistry is a dynamic discipline that stretches the imagination. At the same time Chemistry remains practical and down to earth. Chemists analyze, synthesize, quantitate, and design materials. They also relish creating models and theories that can rationalize what happens in the laboratory. Chemists enjoy discussing experiments and ideas with each other as well as with physicists, biologists, computer scientists, and experts in electronics and materials science. Each day in their experiments chemists use sophisticated instrumentation such as lasers, mass spectrometers, and nuclear magnetic resonance spectrometers. In other words, Chemistry interfaces with a myriad of other disciplines and fields.

The *B.S. Chemistry* degree offers a deep, rigorous experience that will prepare you for the top graduate programs or a career in chemical industry and related fields.

**Prerequisites:**

- AP credit for Physics (125/127 or 139) & (126/128 or 239) will fulfill the Physics requirement.
- AP credit for Math (120 & 121) will fulfill the Math requirement.

Course #	Course Description	Term Completed	Term Typically Offered	Credits
CHEM 210	Structure and Reactivity I		F, W, Sp	4
CHEM 211	Investigations in Chemistry		F, W, Sp	1
CHEM 215	Structure and Reactivity II		F, W, Sp	3
CHEM 216	Structure and Reactivity II: Laboratory		F, W, Sp	2
CHEM 241	Introduction to Chemical Analysis		F, W	2
CHEM 242	Introduction to Chemical Analysis Laboratory		F, W	2
<b>One of the following; CHEM 260 or (230 and 261) or 370</b>				
CHEM 260,	Chemical Principles		F, W	3
CHEM 230 & 261,	Physical Chemical Principles and Applications AND Introduction to Quantum Chemistry		F, W	3/1
CHEM 370	Physical and Chemical Principles Behind Biology and Medicine		F	3
MATH 115	Calculus I		F, W, Sp, Su	4
MATH 116	Calculus II		F, W, Sp, Su	4
<b>One of the following; CHEM 262 or [MATH 215 + 216 or 217]:</b>				
CHEM 262	Mathematical Methods for Chemists		F, W	4
MATH 215 and	Calculus III and		F, W, Sp, Su	4
MATH 216	Introduction to Differential Equations		F, W, Sp, Su	4
MATH 215 and	Calculus III and		F, W, Sp, Su	4
MATH 217	Linear Algebra		F, W, Sp	4

<b>Prerequisite Courses:</b> continue from page 1.		<b>Term Completed</b>	<b>Term Typically Offered</b>	<b>Credits</b>
<b>One of the following groups; 150/151 or 140/141:</b>				
PHYS 150/151 OR PHYS 140/141	Fundamental Physics for the Life Sciences I/ Lab  General Physics I/Elementary Laboratory I		<i>F, W, Sp</i>  <i>F, W, Sp</i>	4/1  4/1
<b>One of the following groups; 250/251 or 240/241:</b>				
PHYS 250/251 OR PHYS 240/241	Fundamental Physics for the Life Sciences II/ Lab  General Physics II/ Elementary Laboratory II		<i>F, W, Sp</i>  <i>F, W, Sp</i>	4/1  4/1

**The Chemistry Program must include the following: Core courses**

Course #	Course Description	Term Completed	Term Typically Offered	Credits
<b>One of the following; 302 or 303:</b>				
CHEM 302 OR CHEM 303	Inorganic Chemistry  Intro Bioinorganic Chemistry: the Role of Metals in Life		<i>W</i>  <i>F,W</i>	3  3
<b>All of the below courses:</b>				
CHEM 399	Undergraduate Research- Taken over 2 semesters		<i>F, W</i>	4
*CHEM 402	Intermediate Inorganic Chemistry		<i>W</i>	3
CHEM 447	Physical Methods of Analysis		<i>W</i>	3
CHEM 461	Physical Chemistry I		<i>F</i>	3
CHEM 462	Computational Chemistry Laboratory		<i>F</i>	1
CHEM 463	Physical Chemistry II		<i>W</i>	3
CHEM 482	Synthesis and Characterization- <i>ULWR</i>		<i>F</i>	3
CHEM 483	Physical and Instrumental Chemistry		<i>W</i>	3
	Advanced Lecture- to be selected with advisor			

**Chemistry honors:**

Students may obtain honors in Chemistry by successfully completing all courses required for the Chemistry major with an overall GPA of 3.4. In addition, students obtaining Honors must write a thesis based on their undergraduate research. Students must register for one credit of CHEM 499 in the term in which they plan to submit their thesis.

**Chemistry GPA requirement:**

A student must earn a cumulative grade point average (GPA) of at least 2.0 in all courses required for the Chemistry major including prerequisites. Transfer courses are not calculated into the GPA.

\*Chem 402 has changed from being offered during the fall semester to winter semester.

- Chem 402 will be offered FA 2021, WI 2023, and will then continue to be offered during WI.

**ACS certified degree:**

To receive an ACS certified degree you must complete CHEM 245/246/247 OR CHEM 303 OR CHEM 351.