



# Interdisciplinary Chemical Sciences Major

University of Michigan - Department of Chemistry

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The *Interdisciplinary Chemical Sciences* (ICS) major allows students the flexibility to supplement a core study of chemistry with courses in complementary fields. This major can be an effective preparation for graduate study in the sciences, for graduate studies in an interdisciplinary area that might benefit from a strong science background, for medical, law, and business schools, or for direct entry into the job market. Because students pursuing the ICS degree have a wide variety of career goals, advising from a chemistry departmental advisor is especially important.

## **Interdisciplinary Chemical Sciences: General principles**

The *Interdisciplinary Chemical Sciences* major allows students substantial flexibility to define the thematic focus of their study. This flexibility comes with a responsibility: each student must work with a chemistry departmental advisor to select the proper upper level chemistry classes and define a cognate course plan when declaring the ICS major. The plan defined when a student declares the major need not be final. In fact, it is quite likely it will evolve as the student learns more and understands better where they want to go with their degree. However, changes must be discussed in advance with a chemistry departmental advisor and approved by the advisor.

Students interested in the ICS major should make an appointment to meet with the designated departmental advisor. The advisor will provide some examples of ICS cognate plans (related to a student's thematic interests) as examples. These are only examples; we expect each student to define their own plan.

**Prerequisites:**

As a prerequisite for the major, students must complete the following courses in Mathematics and Physics, or their equivalents. Some plans will include courses that require additional prerequisite courses including the second term of physics, additional math courses, and/or introductory biology courses but these are not explicitly required for the major.

Course #	Course Description	Term Completed	Term Typically Offered	Credits
MATH 115	Calculus I		<i>F, W, Sp, Su</i>	4
MATH 116	Calculus II		<i>F, W, Sp, Su</i>	4
<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		<i>F, W, Sp</i>	4/1
	General Physics I/ Elementary Laboratory I		<i>F, W, Sp</i>	4/1

**The Interdisciplinary Chemical Sciences Program must include the following:**

The Interdisciplinary Chemical Sciences program requires a minimum of 27 credits in chemistry. These classes must be completed with a minimum grade of a C- in each one. The first semester, introductory course in organic, physical, analytical, and inorganic chemistry make up the core requirements for the ICS major.

**Core courses:**

Course #	Course Description	Term Completed	Term Typically Offered	Credits
CHEM 210	Structure and Reactivity I		<i>F, W, Sp</i>	3
CHEM 211	Investigations in Chemistry		<i>F, W, Sp</i>	2
CHEM 260	Chemical Principles		<i>F, W</i>	3
<b>One of the following groups; (241 and 242) OR (245, 246 and 247):</b>				
CHEM 241	Introduction to Chemical Analysis		<i>F, W</i>	2
CHEM 242 OR CHEM 245	Introduction to Chemical Analysis Laboratory		<i>F, W</i>	2
CHEM 246/247	Biomedical Analytical Chemistry		<i>F, W</i>	2
	Biomedical Analytical Chemistry Laboratory I and II		<i>F, W</i>	1/1
<b>One of the following; 302 or 303:</b>				
CHEM 302 OR CHEM 303	Inorganic Chemistry: Principles of Structure, Reactivity, and Function		<i>F, W</i>	3
	Introductory Bioinorganic Chemistry: The Role of Metals in Life		<i>F, W</i>	3

The remaining 12 credits in chemistry may be selected from departmental offerings, but must include at least 3 chemistry courses numbered 300 and above. At least one of these must be a lecture course at the 400-level.

The ICS major also requires at least 15 credits of cognate courses outside of chemistry as part of a plan designed with the prior approval of a chemistry departmental advisor. These credits must be at the 200-level or above. It is expected that at least two courses (6 of the cognate credits) will be at the 300-level or above.

Only 3 classes can be shared between ICS and a second major.

**Elective Courses:**

Course #	Course Description	Term Completed	Term Typically Offered	Credits

**Honors in Interdisciplinary Chemical Sciences (ICS)**

Students who have a cumulative grade point average of at least 3.4 are encouraged to elect honors in the Interdisciplinary Chemical Sciences. They must also complete an honors thesis based on research [CHEM 399 (4) / CHEM 499 (1)] under the supervision of a faculty member. Students in this major may be pursuing a dual degree and/or undertaking research in a cognate department. Research affirmed as part of the Chemical Sciences by a member of the chemistry faculty may be used to satisfy this requirement.

***Exclusions.** May not be elected by those pursuing a major in Chemistry, Biochemistry, or Biomolecular Science; or any of the Chemistry minors*