The Chemistry Major At Holy Cross

This document is meant to provide additional information regarding sequencing of courses for the Chemistry Major. Most up to date information can be found by navigating to our department webpage and by referring to the College course catalog.

Students who want to major in Chemistry typically begin with Atoms & Molecules (A&M) in their first semester. Students then take Organic Chemistry 1 & 2 in sequence, followed by Equilibrium & Reactivity (E&R).

The 300 level courses can be taken in any order. Typically, students take Instrumental Chemistry (ICAM) and Quantum Mechanics (QMAS) in their third year.

As they are pre-requisites for many upper level courses, it is best to complete Calculus in the first year and Physics in the second year.

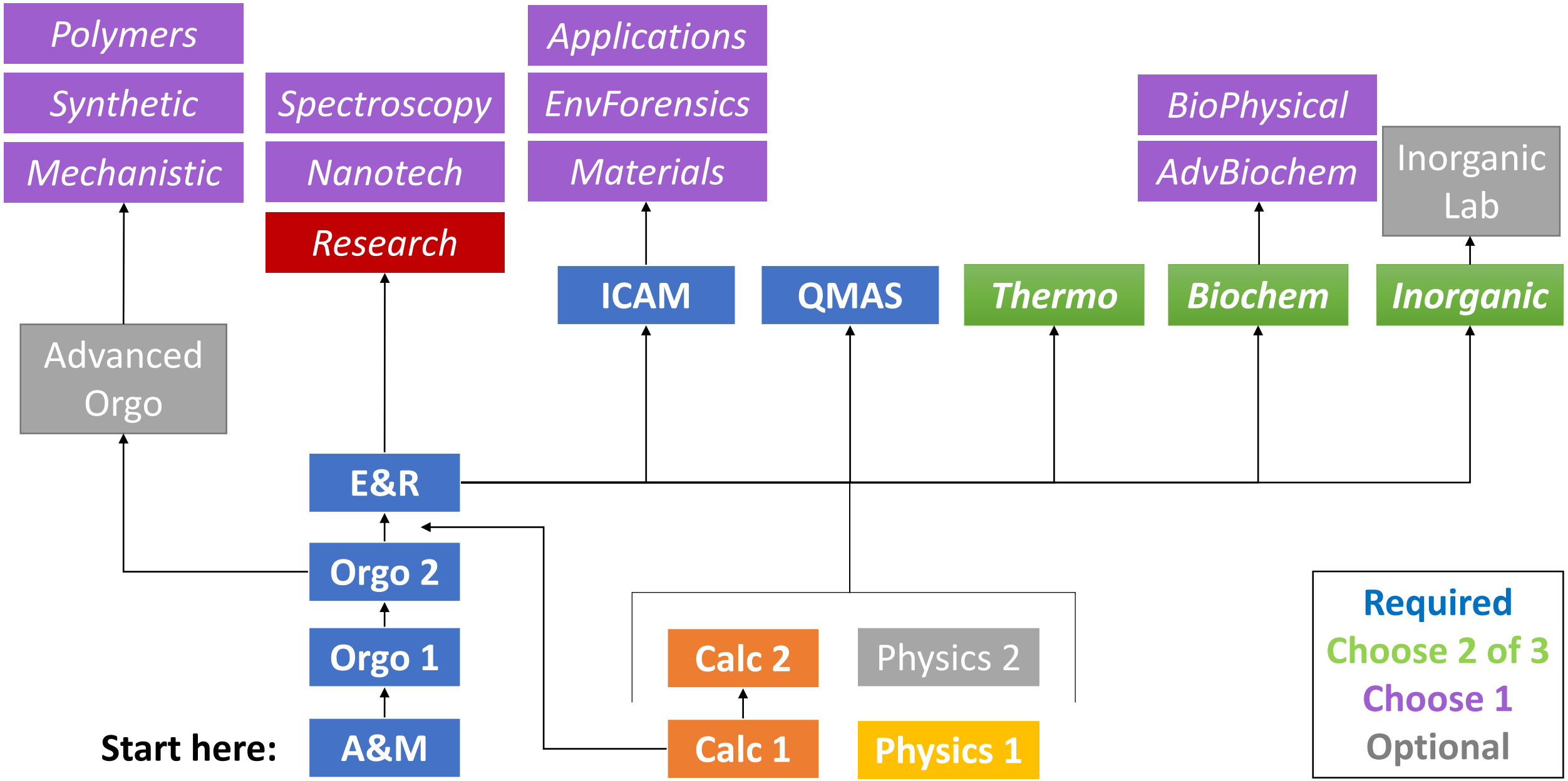
Additional Questions?

Amber Hupp
Department Chair
ahupp@holycross.edu

https://www.holycross.edu/academics/programs/chemistry

Updated April 2024

The Holy Cross Chemistry Major Flow Chart



Chemistry Major Example Schedules

These schedules indicate various ways students can navigate the chemistry major.
Please note that there is flexibility in the sequence of the upper level courses.

These first schedules show our typical pathway, as well as a pathway for those on a premed/prehealth track.

Example - Typical

Year	Fall	Spring
1	A&M Calc 1	Orgo 1 Calc 2
2	Orgo 2 Physics 1	E&R Advanced Orgo
3	ICAM Biochem or Thermo	QMAS
4	Biochem or Thermo	Inorganic with lab Elective

Example - PreMed

Year	Fall	Spring
1	A&M Calc 1	Orgo 1 Calc 2
2	Orgo 2 Bio 1	E&R Bio 2
3	ICAM Physics 1	Biochem Physics 2
4	Thermo Stats	QMAS Elective

These schedules show variations for students who may start the introductory sequence in the second year.

Examples – Starting in Sophomore Year

Year	Fall	Spring
1	Calc 1	Calc 2
2	A&M Physics 1	Orgo 1 E&R
3	Orgo 2 ICAM	QMAS
4	Biochem and/or Thermo	Inorganic Elective

Year	Fall	Spring
1	Calc 1	Calc 2
2	A&M Physics 1	Orgo 1 E&R
3	Orgo 2	Inorganic or Biochem
4	ICAM Thermo	QMAS Elective

Year	Fall	Spring
1	Calc 1	Calc 2
2	A&M	Orgo 1
3	Orgo 2 Physics 1	E&R
4	ICAM Thermo Biochem	QMAS Elective

These schedules show options for students who wish to study abroad.

Examples for Study Abroad

Year	Fall	Spring
1	A&M Calc 1	Orgo 1 Calc 2
2	Orgo 2 Physics 1	E&R Advanced Orgo
3	*Elective (while abroad)*	*Thermo or Inorganic (while abroad)*
4	ICAM Biochem	QMAS

Year	Fall	Spring
1	A&M Calc 2	Orgo 1 E&R
2	Orgo 2 Physics 1	Biochemistry Advanced Orgo
3		
4	ICAM Elective	QMAS Inorganic

Year	Fall	Spring
1	A&M Calc 1	Orgo 1 Calc 2
2	Orgo 2 Physics 1	E&R Advanced Orgo
3		
4	ICAM Biochem or Thermo	Inorganic QMAS elective

This schedule shows how students could receive certification of their degree from the American Chemical Society (ACS).

Example ACS Certification

Year	Fall	Spring
1	A&M Calc 1	Orgo 1 Calc 2
2	Orgo 2 Physics 1	E&R Advanced Orgo Physics 2
3	ICAM Biochem	QMAS
4	Thermo Research	Inorganic with lab Elective Research with report

Students choosing to receive certification from the American Chemical Society should take CHEM 181, 221, 222, 231, 300, 335, 301, 336, 351, and one (non-research) CHEM elective. These students must take one additional half-semester of lab (either Inorganic Chemistry lab or Biochemistry lab) and complete a research project culminating in the preparation of a comprehensive report. Additionally, students should complete a second semester of physics (PHYS 116).

ACS Chemistry for Life®

AMERICAN CHEMICAL SOCIETY

https://www.holycross.edu/academics/programs/chemistry/requirements

This schedule shows how students could be eligible for Chemistry Department Honors.

To graduate with department honors, a student must complete the courses required for the Chemistry major, take four additional courses as specified below, perform a significant quantity and quality of research as determined by the research advisor (or department chair for off-campus projects), complete an acceptable honors-level capstone written project based on the research, and obtain a minimum GPA of 3.40 (Class of 2023-2026) or GPA of 3.50 (Class of 2027) in CHEM courses as reported by the Registrar.

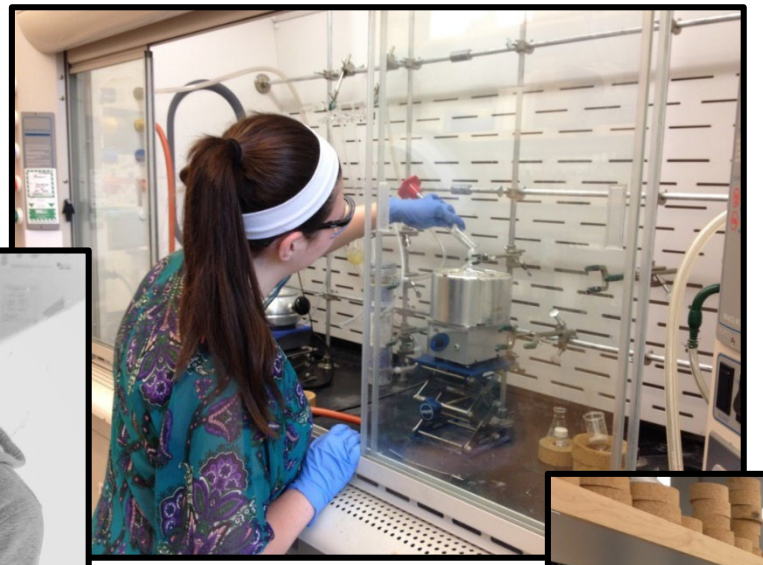
The full list of courses includes:
4 intro courses with lab: CHEM 181, CHEM 221, CHEM 222, CHEM 231
2 intermediate courses with lab: CHEM 300, CHEM 335
3 intermediate courses: CHEM 301, CHEM 336, CHEM 351
1 upper level elective course
Chemistry research with a comprehensive report
1 additional lab: CHEM 352 or BIO 303
2 additional chemistry courses (chemistry electives or research)
3 cognate courses in math and physics: MATH 133 or 135, MATH 134 or 136, and PHYS 115
1 additional course chosen from: PHYS 116, CHEM 289, BIOL 302, or an additional chemistry elective

Example Department Honors

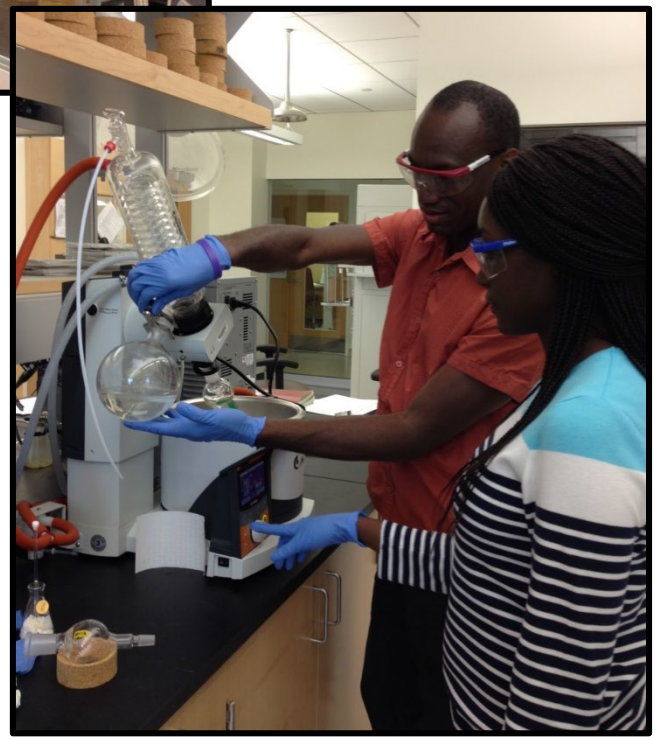
Year	Fall	Spring
1	A&M Calc 1	Orgo 1 Calc 2
2	Orgo 2 Physics 1	E&R Advanced Orgo Physics 2
3	ICAM Biochem	QMAS Biochem 2
4	Thermo Research	Inorganic with lab Elective Research with report

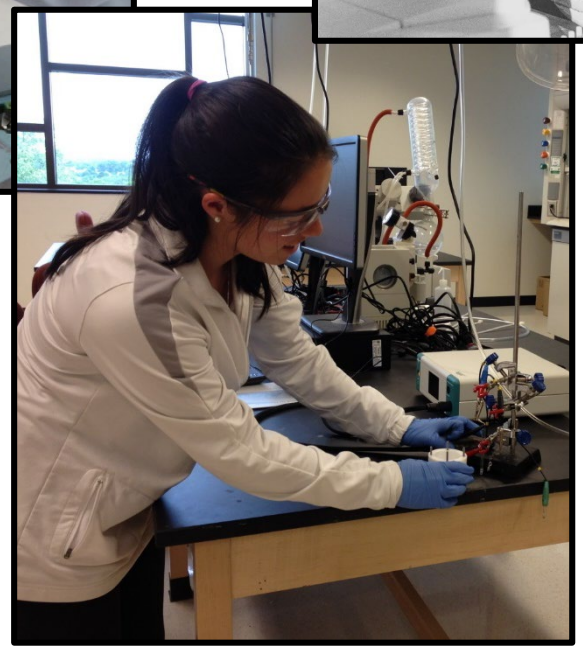
https://www.holycross.edu/academics/programs/chemistry/requirements

Chemistry Research



Work one on one with Holy Cross professors in their research lab on campus





For credit and not for credit options typically beginning in the junior year

Look for an application information session in late January for research the following summer or academic year

https://www.holycross.edu/academics/programs/chemistry/research

Some Specializations

- Biochemistry Concentration

  https://www.holycross.edu/academics/programs/biochemistry

- Environmental Studies Major/Minor

  https://www.holycross.edu/academics/programs/environmental-studies

- Teacher Education Program (TEP)

  https://www.holycross.edu/academics/programs/teacher-education-program