

SCHOOL OF ARTS AND SCIENCES

CHEMISTRY

Faculty

- Frank Black
- William Deutschman
- Robyn Hyde
- Jessica Johnston (Chair)
- Joan Roque

[View Chemistry Courses](#)

Program Goals

- **Content:** Students will master fundamental chemical concepts and have knowledge of advanced chemical principles across a broad spectrum of chemistry disciplines.
- **Laboratory:** Students, while working within a cooperative laboratory environment, will be able to design experiments, carry those experiments out, and utilize modern instruments and techniques effectively. They will demonstrate their critical thinking and problem-solving skills by showing their ability to interpret their results and design new experiments based upon them.
- **Communication:** Students will be able to effectively communicate chemistry-related concepts and experimental results and conclusions in written, visual, and oral formats to scientists and non-scientists.
- **Leadership and Civic Responsibility:** Students will develop their leadership skills, a global perspective on chemistry issues, and engage in practices informed by social responsibility across the spectrum of differences.

Objectives

The Chemistry program offers an academic major leading to a Bachelor of Science degree and an academic minor. The program provides: (1) preparation for a professional career or graduate study in chemistry; (2) an understanding of basic chemistry concepts and experience in laboratory operations for those planning careers in related fields; (3) pre-professional study for those preparing for careers in medicine, dentistry, veterinary medicine, and nursing; and (4) preparation for those who wish to teach at the secondary level.

Program Requirements

Students must maintain a cumulative 2.3 GPA or better in courses required in the academic major. Students choosing a double major or minor within the science program may not apply electives to more than one major or minor. Only classes listed under “required courses” that coincide between both majors/ minors may be applied to both. Students must meet the college-wide graduation requirements in addition to the Chemistry major:

- 124 total hours
- 30 upper division hours
- WCore or Honors College requirements

Chemistry Major

To fulfill the requirements for a major in Chemistry, students must complete the following as well as demonstrate competency in MATH 144:

Requirement Description	CH	PREQ
I. World Language Requirement	8	
Chemistry majors must complete eight credit hours in a single world language.		
II. Lower Division Courses	8	
CHEM 111 Principles of Chemistry I and Lab 4 co-requisites: CHEM 111R recommended; MATH 144 required		
CHEM 112 Principles of Chemistry II and Lab 4 CHEM 111		
III. Upper Division Courses	24	
CHEM 303 Organic Chemistry I 3 CHEM 112 Recommended co-requisite: CHEM 303L		

Requirement Description	CH	PREQ
<p>CHEM 303L Organic Chemistry I Lab</p> <p>1 Pre/Co-requisite of CHEM 303</p> <p>CHEM 304 Organic Chemistry II</p> <p>3 CHEM 303</p> <p>Recommended co-requisite: CHEM 304L</p> <p>CHEM 304L Organic Chemistry II Lab</p> <p>1 Pre/Co-requisite of CHEM 304</p> <p>CHEM 306 Quantitative Analysis and Lab —offered fall of even years</p> <p>4 CHEM 112 and PHYS 151 or PHYS 211</p> <p>CHEM 320 Inorganic Chemistry and Lab —offered spring of odd years</p> <p>4 CHEM 112</p> <p>CHEM 421 Quantum Chemistry and Lab —offered fall of odd years</p> <p>4 CHEM 112, MATH 202, PHYS 212, PHYS 309</p> <p>CHEM 422 Thermodynamics & Statistical Mechanics and Lab — offered spring</p> <p>4 CHEM 112, MATH 202, PHYS 212. PHYS 309</p>		
IV. Electives	12	
<p>Students must take two of the following three courses:</p> <p>CHEM 307 Instrumental Analysis and Lab —offered spring of even years</p> <p>4 CHEM 112 and PHYS 151 or PHYS 211</p> <p>CHEM 350 Biochemistry</p> <p>3 BIOL 205, CHEM 304 and CHEM 303</p> <p>Co-requisite of CHEM/BIOL 350L</p> <p>CHEM 350L Biochemistry Lab</p> <p>1 BIOL 205, CHEM 304 and CHEM 303</p> <p>Co-requisite of CHEM/BIOL 350</p> <p>CHEM 370 Scientific Computing</p>		

Requirement Description	CH	PREQ
<p>4 PHYS 211 or MATH 201 and PHYS 151</p> <p>Students must complete an additional four credit hours of coursework from the following:</p> <p>CHEM 300 Special Topics in Chemistry</p> <p>2-4 Instructor permission</p> <p>CHEM 307 Instrumental Analysis and Lab —offered spring of even years</p> <p>4 CHEM 112 and PHYS 151 or PHYS 211</p> <p>CHEM 350 Biochemistry</p> <p>3 BIOL 205, CHEM 304 and CHEM 303</p> <p>Co-requisite of CHEM/BIOL 350L</p> <p>CHEM 350L Biochemistry Lab</p> <p>1 BIOL 205, CHEM 304 and CHEM 303</p> <p>Co-requisite of CHEM/BIOL 350</p> <p>CHEM 370 Scientific Computing</p> <p>4 PHYS 211 or MATH 201 and PHYS 151</p> <p>CHEM 400 Advanced Topics in Chemistry</p> <p>1-5 Instructor permission</p> <p>CHEM 401 Directed Studies in Chemistry</p> <p>1-4 senior standing, consent of instructor and school dean</p> <p>CHEM 430 Undergraduate Research</p> <p>1-4 faculty mentor permission</p> <p>CHEM 440 Internship</p> <p>1-2 junior/senior standing, see course description</p>		
V. Required Courses from Other Programs	22	
<p>MATH 201 Calculus I</p> <p>4 MATH 144 or placement test</p> <p>MATH 202 Calculus II</p>		

Requirement Description	CH	PREQ
4 MATH 201 or placement test PHYS 211 Physics for Scientists and Engineers I and Lab 4 MATH 144 and co-requisite: MATH 201 PHYS 212 Physics for Scientists and Engineers II and Lab 4 PHYS 211 and co-requisite: MATH 202 PHYS 309 Mathematical Methods of Physics 4 MATH 202 and PHYS 211 WCSAM 400 Science Capstone 2		
Total Hours for the Chemistry Major	76	

Listed below is a suggested plan of study for completing the chemistry requirements. Students should meet with their advisors at least once a year as course offerings may change from what is listed. Students must also meet WCore and college wide requirements for graduation.

Recommended Plan of Study for Chemistry

*Assumes student already has credit for MATH 144

Chemistry Minor

Requirement Description	CH	PREQ
I. Required Courses	16	
CHEM 111 Principles of Chemistry I and Lab 4 co-requisites: CHEM 111R recommended; MATH 144 required CHEM 112 Principles of Chemistry II and Lab 4 CHEM 111 CHEM 303 Organic Chemistry I 3 CHEM 112 Recommended co-requisite: CHEM 303L CHEM 303L Organic Chemistry I Lab 1 Pre/Co-requisite of CHEM 303 CHEM 304 Organic Chemistry II 3 CHEM 303 Recommended co-requisite: CHEM 304L		

Requirement Description	CH	PREQ
CHEM 304L Organic Chemistry II Lab 1 Pre/Co-requisite of CHEM 304		
II. Electives	8	
Complete four hours of coursework from the following: CHEM 300 Special Topics in Chemistry 2-4 Instructor permission CHEM 306 Quantitative Analysis and Lab —offered fall of even years 4 CHEM 112 and PHYS 151 or PHYS 211 CHEM 307 Instrumental Analysis and Lab —offered spring of even years 4 CHEM 112 and PHYS 151 or PHYS 211 CHEM 320 Inorganic Chemistry and Lab —offered spring of odd years 4 CHEM 112 CHEM 350 Biochemistry 3 BIOL 205, CHEM 304 and CHEM 303 Co-requisite of CHEM/BIOL 350L CHEM 350L Biochemistry Lab 1 BIOL 205, CHEM 304 and CHEM 303 Co-requisite of CHEM/BIOL 350 CHEM 370 Scientific Computing 4 PHYS 211 or MATH 201 and PHYS 151 CHEM 401 Directed Studies in Chemistry 1-4 Senior standing, consent of instructor and school dean CHEM 421 Quantum Chemistry and Lab —offered fall of odd years 4 CHEM 112, MATH 202, PHYS 212, PHYS 309 CHEM 422 Thermodynamics & Statistical Mechanics and Lab — offered spring 4		

Requirement Description	CH	PREQ
<p>CHEM 112, MATH 202, PHYS 212. PHYS 309</p> <p>CHEM 430 Undergraduate Research</p> <p>1-4 Faculty mentor permission</p> <p>CHEM 440 Internship</p> <p>1-4 Junior/senior standing, see course description</p> <p>Complete at least four additional hours from the following:</p> <p>CHEM 306 Quantitative Analysis and Lab —offered fall of even years</p> <p>4 CHEM 112 and PHYS 151 or PHYS 211</p> <p>CHEM 307 Instrumental Analysis and Lab —offered spring of even years</p> <p>4 CHEM 112 and PHYS 151 or PHYS 211</p> <p>CHEM 320 Inorganic Chemistry and Lab —offered spring of odd years</p> <p>4 CHEM 112</p> <p>CHEM 350 Biochemistry</p> <p>3 BIOL 205, CHEM 304 and CHEM 303</p> <p>Co-requisite of CHEM/BIOL 350L</p> <p>CHEM 350L Biochemistry Lab</p> <p>1 BIOL 205, CHEM 304 and CHEM 303</p> <p>Co-requisite of CHEM/BIOL 350</p> <p>CHEM 370 Scientific Computing</p> <p>4 PHYS 211 or MATH 201 and PHYS 151</p> <p>CHEM 422 Thermodynamics & Statistical Mechanics and Lab — offered spring</p> <p>4 CHEM 112, MATH 202, PHYS 212. PHYS 309</p>		
Total Hours for the Chemistry Minor	24	