

# CHEMISTRY

Professors Goodwin, Kopper, and Teague  
Associate Professors Gron and Hales (chair)  
Visiting Assistant Professor Willis

## MAJOR

13 courses distributed as follows:

### **Chemistry (8)**

- CHEM 110 *General Chemistry I: Chemical Structure and Properties*
- CHEM 120 *General Chemistry II: Chemical Analysis and Reactivity*
- CHEM 240 *Organic Chemistry I*
- CHEM 250 *Organic Chemistry II*
- CHEM 310 *Physical Chemistry: Quantum Mechanics and Spectroscopy*
- CHEM 320 *Physical Chemistry: Thermodynamics and Chemical Kinetics*
- CHEM 340 *Advanced Inorganic Chemistry*
- CHEM 330 *Biochemistry*

**or**

CHEM 350 *Advanced Analytical Chemistry*

**or**

CHEM 410 *Advanced Physical Chemistry*

### **Mathematics (2)**

- MATH 130 *Calculus I*
- and**
- MATH 140 *Calculus II*

### **Physics (2)**

- PHYS 230 and 240 *General Physics I and II (Calculus-based)* (recommended)

**or**

PHYS 210 and 220 *General Physics I and II*

### **Biology (1)**

- BIOL 150 *Cell Biology* (or equivalent)

All majors must also take two semesters of CHEM ATC *ATEC Laboratory*, and two semesters of CHEM 497 *Chemistry Seminar*. These do not carry course credit.

## Senior Capstone Experience

The Senior Capstone Experience for the chemistry major consists of two parts. The first part is the Major Field Achievement Test (MFT) in chemistry. The second part is a literature-based research paper written under the direct supervision of a faculty member and presented as a seminar. The grade for the Senior Capstone Experience is the average of grades based on the two parts of the experience.

## American Chemical Society Certified Degree in Chemistry:

Requirements for the chemistry major plus

- CHEM 330 *Biochemistry*
- CHEM 350 *Advanced Analytical Chemistry*
- CHEM 450 *Directed Research*

## MINOR

- CHEM 110 *General Chemistry I: Chemical Structures and Properties*
- CHEM 120 *General Chemistry II: Chemical Analysis and Reactivity*
- CHEM 240 *Organic Chemistry I*
- CHEM 250 *Organic Chemistry II*
- two additional courses in chemistry above the 250-level

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## Courses

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### CHEM 100 *Concepts of Chemistry* (NS)

The theories, models, structures, and reactions of modern chemistry are introduced to the nonscience major. Historical antecedents in the development of current concepts of matter are explored. Mathematical problem-solving in a chemistry context is included.

### CHEM 110 *General Chemistry I: Chemical Structure & Properties* (NS-L)

Theories of matter with emphasis on environmental applications. Laboratory includes separations and spectroscopy.

### CHEM 120 *General Chemistry II: Chemical Analysis & Reactivity*

Reactions and equilibria of environmental significance. Laboratory involves analysis of environmental samples. *Prerequisite: CHEM 110.*

**CHEM 240 *Organic Chemistry I***

The compounds of carbon with an emphasis on structure, nomenclature, and stereochemistry. Laboratory course. *Prerequisite: CHEM 120.*

**CHEM 250 *Organic Chemistry II***

The compounds of carbon with an emphasis on reaction mechanisms and spectroscopy. Laboratory course. *Prerequisite: CHEM 240.*

**CHEM 310 *Physical Chemistry: Quantum Mechanics and Spectroscopy (W2)***

Application of physical principles and mathematical descriptions to chemical systems: quantum theory, atomic structure, molecular structure and bonding, interactions of matter with electromagnetic radiation. *Prerequisites: MATH 140, PHYS 220 or 240, and CHEM 250 or consent of instructor. Corequisite: CHEM ATC.*

**CHEM 320 *Physical Chemistry: Thermodynamics and Chemical Kinetics***

Application of physical principles and mathematical descriptions to chemical systems: chemical and statistical thermodynamics, chemical kinetics and dynamics. *Prerequisites: MATH 140, PHYS 210 or 230, and CHEM 250 or consent of instructor. Corequisite: CHEM ATC.*

**CHEM 330 *Biochemistry***

Fundamental biochemistry with emphasis on cellular constituents and molecular structure and function. Laboratory course. *Prerequisite: CHEM 250.*

**CHEM 340 *Advanced Inorganic Chemistry***

The elements and the periodic table with emphasis on modern structural theory. *Prerequisite: CHEM 310.*

**CHEM 350 *Advanced Analytical Chemistry***

Spectroscopic and electroanalytical methods including structural determinations. *Prerequisite: CHEM 120.*

**CHEM 410 *Advanced Physical Chemistry (NS-L, QS, W2)***

The course will focus on current topics in physical chemistry. Laboratory course. Cross-listed as PHYS 315 Modern Physics. *Prerequisite: CHEM 320.*

**CHEM 430 *Integrated Biochemical Topics***

Current topics in biochemistry, biochemical reactions and mechanisms, and macromolecular structure and function will be discussed. *Prerequisite: CHEM 330.*

**CHEM 450 *Directed Research***

Independent laboratory research conducted in conjunction with a specific faculty member. Research topics are selected on an individual basis. The results of the research are typically presented at a national scientific meeting in the spring and a final research report is written.

**CHEM 497 *Seminar***

No credit. Seminars by invited speakers, students, and faculty. *Prerequisite: senior standing.*

**CHEM ATC *Advanced Techniques in Experimental Chemistry* (ATEC Lab)**

No Credit. Unified laboratory experience combining physical, inorganic, and analytical chemistry techniques, including data analysis and computational modeling. *Corequisite: CHEM 310 or 320.*