

markets, and how these markets affect the functioning of the economy as a whole. Students also study the evolution of the public policy response (anti-trust and regulation) to these structures. *Prerequisite: Economics 203 or 204. Offered alternate spring terms.*

**347 Comparative Economic Systems (3)**

A comparison of dominant economic systems and their development. This course highlights the contrasts and similarities among systems, and emphasizes U.S. and Soviet economics. **This course fulfills the Cultural Perspective requirement of the Doane Plan.** *Prerequisite: Economics 203 or 204. Offered alternate spring terms.*

**419 History of Economic Thought (3)**

An exploration of leadership concepts as they examine economic thought from the mercantilist to the present, with emphasis on such schools of thought as the Classical, Marxist, Neo-Classical, Keynesian and Monetarist. *Prerequisite: Economics 203 and 204. Offered alternate fall terms.*

**421 Economics Internship (0-12)**

Designed to offer students a professional experience in the field of economics in an institutional setting such as a government or financial institution. *Prerequisite: Cooperative Education 205 and Economics faculty permission. (Pass/Fail)*

**495 Seminar (3)**

The utilization of the techniques of economic research combined with intensive reading and discussion of selected topics. *Prerequisite: Junior or senior economics major or minor. Offered alternate spring terms.*

## Chemistry (CHM)

**Professor Smith**

**Associate Professor Clevette**

**Assistant Professor Holmes**

Chemistry is the study of matter and its changes. These changes affect everything we eat, wear, and touch. Chemistry is the only science that studies the changes that involve both huge industries and the well-being of each of us. Chemists are employed in almost every sector of the economy. The work called chemistry is incredibly varied.

Chemistry graduates pursue advanced degrees in chemistry, chemical engineering, pharmacy, medicine, medical technology, law, and other areas. Other graduates obtain jobs in the chemical or pharmaceutical industries.

### Requirements for the Chemistry Major:

Complete 1 or 2.

1. Students not seeking certification for public school teaching of chemistry must complete the following:
  - a. The following eight courses in chemistry: Chemistry 125, 126, 203, 205, 206, 256, 411, and 412.
  - b. One additional course in chemistry at the 300-400 level.

- c. The following cognates: Mathematics 105 (or equivalent), 125 (or equivalent), 235, 236, and Physics 107, 108.
2. Students seeking certification for public school teaching in chemistry must complete:
  - a. The following nine courses in chemistry: Chemistry 125, 126, 203, 205, 206, 256, 408, 411 and 412.
  - b. The following cognates from the natural sciences: Physics 107 and 108, Biology 101, and either Astronomy 103 and 103L or Geology 103.
  - c. The following cognates in mathematics: Mathematics 105 (or equivalent), 125 (or equivalent), 235, 236.
  - d. The following natural science methods courses: Natural Science 322, 324, 326, and 327.
  - e. One additional teaching major.
  - f. All requirements listed under the catalog section Secondary Education.

#### **Requirements for the Chemistry Subject Endorsement:**

Students who are not chemistry majors and are seeking certification for public school teaching in chemistry must complete the following:

1. A total of 24 credits in chemistry, which includes Chemistry 125, 126, 203, 205, eight credits chosen from Chemistry 206, 322, 408, 426. An additional course, Chemistry 256, is recommended.
2. Cognates Biology 101; Geology 103 or 104; Natural Science 322, 324, 326, 327; Physics 107.
3. A teaching major.
4. All requirements listed under the catalog section Secondary Education.

#### **Requirements for the Chemistry Minor:**

Complete the following courses: Chemistry 125, 126, 203, 205, and one additional four-credit course in chemistry.

#### **125-126 General Chemistry (4) (4)**

A detailed study of the fundamentals of chemistry, including gas laws, kinetics and equilibria. *Prerequisites: One year of high school chemistry and physics or permission; Mathematics 105 or equivalent (may be taken concurrently).*

#### **203 Analytical Chemistry (4)**

An introduction to modern analytical laboratory techniques, including statistical treatment of data, sampling, separations, and some treatment of equilibrium. The laboratory portion of the class includes modern instrumentation. General laboratory methods of standard curves and standard additions are used. *Prerequisite: Chemistry 125, 126 (or equivalent).*

**205-206 Organic Chemistry (4) (4)**

A study of the properties and reactions of carbon compounds. *Prerequisite: Chemistry 125, 126 (or equivalent).*

**256 Chemical Equilibrium (2)**

An exploration of the systematic computational treatment of aqueous solution equilibrium, including acid-based, precipitation, and metal-ligand systems. Numerical techniques are used to solve complex equilibrium and to interpret titration data. *Prerequisite: Chemistry 125, 126 (or equivalent), 203 (may be taken concurrently), and Information Science and Technology 102 (may be taken concurrently).*

**290, 390, 490 Directed Study (1-3) (1-3) (1-3)**

An opportunity for supervised, independent study of a particular topic based on the interest of the student and the availability and approval of the faculty.

**322 Instrumental Analysis (4)**

A survey of analytical methods using instrumental techniques such as spectrophotometry, polarography and conductimetry. *Prerequisite: Chemistry 125, 126 (or equivalent). Offered alternate spring terms.*

**408 Introduction to Biochemistry (4)**

An introductory survey of the molecular structure and function of biologically important molecules, metabolic cycles, and other topics of a rapidly expanding field. *Prerequisite: Chemistry 205. Offered alternate years.*

**411-412 Physical Chemistry (4) (4)**

An introduction to the detailed study of chemical thermodynamics, kinetics, electro-chemistry, the solid and gaseous states, and spectra. *Prerequisite: Chemistry 125, 126 (or equivalent), Chemistry 203 (or permission), and Mathematics 236. May be taken concurrently with Mathematics 236.*

**421 Chemistry Internship (0-12)**

On-the-job experience in chemistry. *Prerequisite: Cooperative Education 205 or permission. (Pass/Fail)*

**426 Advanced Inorganic Chemistry (4)**

A survey course including modern theories of bonding and the chemistry of transition metal compounds, including organometallics. *Prerequisite: Chemistry 125, 126 (or equivalent) and junior standing. Offered alternate years.*