

General Information

For intended Chemistry majors, a typical first semester program consists of CHEM 131 or CHEM 171, depending on the student's interest and preparation; MTH 161, with advice from the mathematics department; a writing course as recommended by the College Writing Program; and an elective. CHEM 131, General Chemistry, and CHEM171, honors Organic Chemistry, are both appropriate for students intending to major in Chemistry. CHEM 137 is also available in the fall semester and is an introduction to general chemistry specifically for engineering students whose majors require a single semester of chemistry. Students anticipating a major in chemistry are encouraged to meet with a faculty advisor from the department during First-Year year in order to explore the individual student's needs and tactics for preparation for a possible major in chemistry.

1. Advanced Placement (AP) Course Placement Methods

Students who have received the following scores on an advanced high-school course are entitled to credit for CHEM 131 and have several options available: **AP exam** score of 4 or 5; **IB higher-level (HL)** score of 6 or higher; **Cambridge A-level** score of A; **CBSE** score >90%; **HSC** score of A or higher. Students may:

- 1) **Accept the AP credit for CHEM 131** and apply for admission to enroll in CHEM 171 First-Year Organic Chemistry (This option allows students to skip CHEM 132 in the Spring, take Organic Chemistry their first year with a smaller cohort, and fast tracks students to more advanced chemistry courses and the fulfillment of degree requirements in other disciplines.)
- 2) **Accept the AP credit for CHEM 131, and not take chemistry in the fall semester, with subsequent enrollment in CHEM 132 in the spring semester, or**
- 3) **Waive this AP credit and enroll in CHEM 131 in the Fall**

The Department expects that some students will select each of these options, depending on their preparation in chemistry and their future interests.

Courses

The chemistry department offers three courses for entering First-Year during the first semester: **CHEM 131 (Chemical Concepts, Systems and Practices I)**, **CHEM 137 (Chemical Principles for Engineers)**, and **CHEM 171 (First-Year Organic Chemistry)**. CHEM 131 and CHEM 171 are appropriate for students majoring in chemistry. CHEM 137 is for students majoring in one of the Engineering majors that only requires one semester of Chemistry. Two sections of CHEM 131 are offered, and both sections are of comparable difficulty and cover the same general topics. CHEM 171 is an honors course on organic chemistry that is available to First-Year students with high scores on AP or international exams (see above). Students should select the course that most closely supports their particular interests. Both the CHEM BA and BS chemistry degrees require only two courses in physics, Physics 121–122, or 113–114. However, chemistry majors pursuing a BS degree are strongly encouraged to take the Physics 121–123 sequence and begin during the spring semester of the first year. All chemistry majors should continue with their mathematics sequence in the spring semester. (see reverse side/page 2 for course details)

For those interested in HEALTH PROFESSIONS:

Schools of medicine, dentistry, optometry, podiatry, and veterinary medicine have similar foundational prerequisites for admission. Because **individual programs may vary**, students should investigate the requirements of their programs or schools of interest and **Speak with a Health Professions Advisor**:

Health Professions Advising, 203 Lattimore Hall, River Campus, urhealthprofessions@UR.rochester.edu,
(585) 276-7315, www.rochester.edu/college/health/about/contact.html

PRE-REQUISITE CHEMISTRY COURSES FOR MEDICAL, DENTAL AND VET PROGRAMS

(from: www.rochester.edu/college/health/academics/pre-req.html)

Below are chemistry course options for students to consider in order to fulfill pre-requisite coursework for health professions graduate programs. Please note that this is not an exhaustive list and it is always best to speak with an advisor to determine which options make the most sense for you. Please also refer to our Sample Schedules.

Chemistry: Two semesters of General (or Inorganic) Chemistry with labs: CHEM 131, CHEM 132, CHEM 137, CHEM 211

Two semesters of Organic Chemistry w/labs: CHEM 171/173, CHEM 172/208(or 210W), CHEM 203/207, CHEM 204/208(or 210W).

Biochemistry: One semester : BIO 250L or CHEM 262

CHEM 131 Chemical Concepts, Systems, and Practices I (5 cr)

This course serves as an introduction to the concepts of chemistry for science and engineering students and health professions students and as a science course for students of the humanities and social sciences. Properties of chemical systems are discussed from a macroscopic and molecular perspective, with examples developed from a theme of energy and the environment. Topics include stoichiometry, atoms and molecules, properties of gases, thermochemistry, chemical equilibrium, acids and bases, solubility equilibria, and oxidation-reduction reactions. These topics are discussed in the context of the following energy and environment-related issues: elemental resources of our planet, energy production and utilization, what makes a good fuel, and aqueous resources. **There are two sections to choose from, both are two 75-minute (T, R) lectures per week. In addition to lectures, there is a 75-minute workshop meeting each week. A 50-minute lab lecture and three-hour laboratory also meet in alternate weeks.**

Prior to the start of the semester, **students should register for 4 components:**

1. either **CHEM 131 5 credit Lectures** with Dr. Hafensteiner: CHEM 131-2|TR| 1105-1220
or CHEM 131-1|TR| 1230-1345
2. a **CHEM 131 Workshop** (offered on various days/times)
3. either **CHEM 131 Lab Lecture A or B** with Dr. Stanford:
Lect. A: CHEM 131-3 [M] 1300-1350 or Lab Lect. B: CHEM 131-4 |M|1025-1115
4. either a **CHEM 131 Laboratory A or B** (Laboratory "A" if in Lab Lecture A, Laboratory "B" if in Lab Lecture B).

CHEM 137 Chemical Principles for Engineers (4 cr)

This course is a one-semester introduction to general chemistry specifically **for engineering students requiring only one semester of chemistry**. The course will discuss the microscopic and macroscopic basis for chemical structure and reactivity and is designed to give engineering students a conceptual foundation in the principles of chemistry that are relevant to solving engineering problems. Important topics include the nature of chemical compounds; stoichiometry, properties of gases; the Periodic Table; electrons and atoms; chemical bonding and applications to materials; thermodynamics and energy; rates of chemical reactions; chemical equilibrium; electrochemistry.

There are two 75-minute [W] lectures per week. In addition to lectures, there is a 75-minute workshop meeting each week. A 50-minute lab lecture and 3-hour laboratory meet in alternate weeks.

Prior to the start of the semester, **students should register for 3 components:**

1. the **main CHEM 137 4 credit Lecture** (CHEM 137-1|TR|1525-1640 (Rothberg))
2. either **CHEM 137 Lab Lecture A or B** with Dr. Stanford: Lab Lect. A: CHEM 137-3|W|1230-1345
or Lab Lect. B: CHEM 137-2|W|1525-1640
3. either a **CHEM 137 Laboratory A or B** (Laboratory "A" if in Lab Lecture A, Laboratory "B" if in Lab Lecture B).
(CHEM 137 Workshops will be offered at various times, and students will sign up for a particular workshop section in the first week of classes.)

CHEM 171/173 and 172/210 First-Year Organic Chemistry.

These courses constitute a one-year exploration of the basic observations, concepts, and practice of organic chemistry, with a focus on the fundamental relationships among molecular structure and chemical reactivity. The exploration requires that students grapple with defining questions, evaluating evidence, weighing arguments, reflecting on epistemological issues, constructing new experiments, etc. The study of organic chemistry is carefully integrated with a review of the key concepts from general chemistry. CHEM 171 designed for first year students with good preparation in chemistry (e.g., two years of general chemistry and **Advanced Placement score 4 or 5**). This sequence fast tracks students to more advanced chemistry courses and the fulfillment of degree requirements in other disciplines.

Notes on First-Year Organic Chemistry (CHEM 171, 172, 173):

- CHEM 171 (Fall) and 172 (Spring) are each four-credit courses that individually meet for three separate lectures and one two-hour workshop each week.
- CHEM 171 (Fall) has a **required** companion lab, CHEM 173, that meets for one lab afternoon per week (1 credit).
- CHEM 172 (Spring) has a **required** companion lab, CHEM 210W* (2 credits) or CHEM 208 (1 credit).

*Chemistry majors should take CHEM 210W.

Prior to the start of the semester, **students should register for 4 components:**

1. the **main CHEM 171 4 credit Lecture** CHEM 171-1|MWF|1150-1240 | Paradine
4. a **CHEM 171 Workshop** (offered on various days/times)
2. the **CHEM 173 Lab Lecture** CHEM 173-1|F|1300-1500|Olsen
3. one of the **CHEM 173 Lab sections** (offered Tues-Thurs)