CHEMISTRY - B.S.

About This Program
Kent State’s Bachelor of Science in Chemistry program offers an exciting opportunity to pursue a dynamic career in the field. With a rigorous curriculum and hands-on experience, you’ll gain the skills and knowledge needed to excel in a wide range of industries, including pharmaceuticals, biotechnology, environmental science and more. Our program also provides a solid foundation for advanced studies in chemistry. Enroll now and start your journey towards a fulfilling career in chemistry. Read more...

Contact Information
- Program Coordinator: Scott Bunge | sbunge@kent.edu | 330-672-9445
- Speak with an Advisor
- Chat with an Admissions Counselor

Program Delivery
- Delivery: in person
- Location: Kent Campus

Examples of Possible Careers and Salaries*

Chemical technicians
- 2.8% slower than the average
- 68,100 number of jobs
- $49,820 potential earnings

Chemistry teachers, postsecondary
- 4.3% about as fast as the average
- 26,400 number of jobs
- $80,400 potential earnings

Chemists
- 4.7% about as fast as the average
- 86,700 number of jobs
- $79,300 potential earnings

Food scientists and technologists
- 4.4% about as fast as the average
- 14,200 number of jobs
- $73,450 potential earnings

Forensic science technicians
- 14.1% much faster than the average
- 17,200 number of jobs
- $60,590 potential earnings

Natural sciences managers
- 4.8% about as fast as the average
- 71,400 number of jobs
- $137,940 potential earnings

Secondary school teachers, except special and career/technical education
- 3.8% about as fast as the average
- 1,050,800 number of jobs
- $62,870 potential earnings

Accreditation
The B.S. degree in Chemistry is accredited by the American Chemical Society (ACS).

* Source of occupation titles and labor data comes from the U.S. Bureau of Labor Statistics’ Occupational Outlook Handbook. Data comprises projected percent change in employment over the next 10 years; nation-wide employment numbers; and the yearly median wage at which half of the workers in the occupation earned more than that amount and half earned less.

Admission Requirements
The university affirmatively strives to provide educational opportunities and access to students with varied backgrounds, those with special talents and adult students who graduated from high school three or more years ago.

First-Year Students on the Kent Campus: First-year admission policy on the Kent Campus is selective. Admission decisions are based upon cumulative grade point average, strength of high school college preparatory curriculum and grade trends. Students not admissible to the Kent Campus may be administratively referred to one of the seven regional campuses to begin their college coursework. For more information, visit the admissions website for first-year students.

First-Year Students on the Regional Campuses: First-year admission to Kent State’s campuses at Ashtabula, East Liverpool, Geauga, Salem, Stark, Trumbull and Tuscarawas, as well as the Twinsburg Academic Center, is open to anyone with a high school diploma or its equivalent. For more information on admissions, contact the Regional Campuses admissions offices.

International Students: All international students must provide proof of English language proficiency unless they meet specific exceptions. For more information, visit the admissions website for international students.

Transfer Students: Students who have attended any other educational institution after graduating from high school must apply as undergraduate transfer students. For more information, visit the admissions website for transfer students.

Former Students: Former Kent State students or graduates who have not attended another college or university since Kent State may complete the reenrollment or reinstatement form on the University Registrar’s website.
Program Requirements

Major Requirements

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CHEM 10060</td>
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<tr>
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<tr>
<td>or CHEM 11060</td>
<td>GENERAL CHEMISTRY I BOOST (KBS)</td>
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<td>GENERAL CHEMISTRY II (KBS)</td>
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<tr>
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<td>CHEM 10062</td>
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<td>Kent Core Humanities and Fine Arts (minimum one course from each)</td>
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<td>General Electives (total credit hours depends on earning 120 credits hour, including 39 upper-division credit hours)</td>
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Chemistry Concentration Requirements

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<td>CHEM 40555</td>
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<td>CHEM 40451</td>
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<tr>
<td>CHEM 40559</td>
<td>NANOMATERIALS</td>
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<tr>
<td>CHEM 40571</td>
<td>SURFACE CHEMISTRY</td>
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Concentration Requirements (courses count in major GPA)

<table>
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<tr>
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<td>CHEM 40557</td>
<td>PHYSICAL CHEMISTRY LABORATORY</td>
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<td>MATH 12002</td>
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Advisor-Approved Chemistry (CHEM) Upper-Division Elective (40000 level)

Additional Requirements (courses do not count in major GPA)

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<thead>
<tr>
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<th>Credit Hours</th>
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<tr>
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<td>ANALYTIC GEOMETRY AND CALCULUS I (KMCR)</td>
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<tr>
<td>MATH 12022</td>
<td>PROBABILITY AND STATISTICS FOR LIFE SCIENCES</td>
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Minimum Total Credit Hours: 120

Admission policies for undergraduate students may be found in the University Catalog.

Some programs may require that students meet certain requirements before progressing through the program. For programs with progression requirements, the information is shown on the Coursework tab.

Industrial Chemistry Concentration Requirements

<table>
<thead>
<tr>
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<tr>
<td>MATH 12022</td>
<td>PROBABILITY AND STATISTICS FOR LIFE SCIENCES</td>
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<td>or MATH 22005</td>
<td>ANALYTIC GEOMETRY AND CALCULUS III</td>
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<tr>
<td>PHY 22564</td>
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Concentration Electives, choose from the following:

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<td>PROJECT MANAGEMENT</td>
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<tr>
<td>CHEM 30284</td>
<td>INTRODUCTION TO BIOLOGICAL CHEMISTRY</td>
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<tr>
<td>CHEM 40092</td>
<td>INTERNSHIP IN CHEMISTRY AND BIOCHEMISTRY (ELR)</td>
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A minimum C grade must be earned to fulfill the writing-intensive requirement.
Materials Chemistry Concentration Requirements

General Electives

Minimum Total Credit Hours: 67

1 A minimum C grade must be earned to fulfill the writing-intensive requirement.

2 Taking both CHEM 40555 and CHEM 40556 may be substituted in place of CHEM 40567 and 2 credit hours of concentration electives.

3 CHEM 40092 is strongly encouraged.

Roadmaps

Chemistry Concentration

This roadmap is a recommended semester-by-semester plan of study for this major. However, courses designated as critical (!) must be completed in the semester listed to ensure a timely graduation.

<table>
<thead>
<tr>
<th>Semester One</th>
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<tbody>
<tr>
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<td>or CHEM 10970</td>
<td>4-6</td>
</tr>
<tr>
<td>or CHEM 11060</td>
<td>4-6</td>
</tr>
<tr>
<td>! CHEM 1062</td>
<td>1</td>
</tr>
<tr>
<td>! MATH 12002</td>
<td>5</td>
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<tr>
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<td>1</td>
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<tr>
<td>FLASHES 101</td>
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<tr>
<td>Kent Core Requirement</td>
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<tr>
<td>Semester Two</td>
<td></td>
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<tr>
<td>! CHEM 10061</td>
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<td>or CHEM 10971</td>
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<tr>
<td>! CHEM 1063</td>
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</table>
Kent Core Requirement 3

**Semester Three**

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<td>ANALYTIC GEOMETRY AND CALCULUS III</td>
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Kent Core Requirement 3

| Credit Hours | 16 |

**Semester Four**

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Foreign Language 4

Kent Core Requirement 3

| Credit Hours | 15 |

**Semester Five**

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<td>CHEM 40477</td>
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Kent Core Requirement 3

| Credit Hours | 16 |

**Semester Six**

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Foreign Language 4

Kent Core Requirement 3

| Credit Hours | 15 |

**Semester Seven**

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General Electives 6

| Credit Hours | 13 |

**Semester Eight**

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General Electives 8

| Credit Hours | 15 |

**Industrial Chemistry Concentration**

This roadmap is a recommended semester-by-semester plan of study for this major. However, courses designated as critical (!) must be completed in the semester listed to ensure a timely graduation.

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<td>or</td>
<td>CHEM 11060</td>
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or CHEM 10970 | GENERAL CHEMISTRY I (KBS) | or CHEM 10971 | HONORS GENERAL CHEMISTRY I (KBS) | 6 |

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Kent Core Requirement 3

| Credit Hours | 14 |

**Semester Two**

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<tbody>
<tr>
<td>CHEM 10061</td>
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<td>or</td>
<td>CHEM 10971</td>
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<tr>
<td>CHEM 10063</td>
<td>GENERAL CHEMISTRY II LABORATORY (KBS) (KLAB)</td>
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<td>MATH 12003</td>
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Kent Core Requirement 3

| Credit Hours | 16 |

**Semester Three**

<table>
<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>CHEM 30475</td>
<td>ORGANIC CHEMISTRY LABORATORY I (ELR)</td>
<td>1</td>
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<td>CHEM 30481</td>
<td>ORGANIC CHEMISTRY I</td>
<td>3</td>
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<tr>
<td>MATH 12022</td>
<td>PROBABILITY AND STATISTICS FOR LIFE SCIENCES</td>
<td>3</td>
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<td>MATH 22005</td>
<td>ANALYTIC GEOMETRY AND CALCULUS III</td>
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Kent Core Requirement 3

| Credit Hours | 15 |

**Semester Four**

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<td>CAREER PATHWAYS IN CHEMISTRY</td>
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<td>CHEM 30301</td>
<td>INORGANIC CHEMISTRY I</td>
<td>3</td>
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<td>CHEM 30476</td>
<td>ORGANIC CHEMISTRY LABORATORY II</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 30482</td>
<td>ORGANIC CHEMISTRY II</td>
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<td>PHY 23102</td>
<td>GENERAL UNIVERSITY PHYSICS II (KBS) (KLAB)</td>
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<tr>
<td>ECON 22060</td>
<td>PRINCIPLES OF MICROECONOMICS (KSS)</td>
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| Credit Hours | 16 |

**Semester Five**

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<tbody>
<tr>
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<td>CHEM 30107</td>
<td>ANALYTICAL CHEMISTRY LABORATORY I (WIC)</td>
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<td>CHEM 40556</td>
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<td>CHEM 40567</td>
<td>PHYSICAL CHEMISTRY FOR LIFE SCIENCES</td>
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Foreign Language 4

| Credit Hours | 14 |

**Semester Six**

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<td>CHEM 30108</td>
<td>ANALYTICAL CHEMISTRY LABORATORY II (WIC)</td>
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<td>CHEM 40568</td>
<td>ELEMENTARY PHYSICAL CHEMISTRY LABORATORY</td>
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General Electives 6

| Credit Hours | 15 |

**Semester Seven**

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<tr>
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<tr>
<td>CHEM 40302</td>
<td>INORGANIC CHEMISTRY II</td>
<td>2</td>
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<tr>
<td>CHEM 40557</td>
<td>PHYSICAL CHEMISTRY LABORATORY</td>
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<tr>
<td>Chemistry (CHEM) Upper-Division Elective (40000 level)</td>
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General Electives 6

| Credit Hours | 16 |

**Semester Eight**

<table>
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<tr>
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<tbody>
<tr>
<td>CHEM 40303</td>
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<tr>
<td>CHEM 40364</td>
<td>INTERMEDIATE INORGANIC CHEMISTRY LAB</td>
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General Electives 8

| Credit Hours | 15 |

**Minimum Total Credit Hours:** 120
## Materials Chemistry Concentration

This roadmap is a recommended semester-by-semester plan of study for this major. However, courses designated as critical (!) must be completed in the semester listed to ensure a timely graduation.

### Semester One

<table>
<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>CHEM 10060</td>
<td>GENERAL CHEMISTRY I (KBS)</td>
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<td>or</td>
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<tr>
<td>CHEM 10970</td>
<td>GENERAL CHEMISTRY I BOOST (KBS)</td>
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<td>or</td>
<td>CHEM 11060</td>
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</tr>
<tr>
<td>CHEM 10062</td>
<td>GENERAL CHEMISTRY I LABORATORY (KBS) (KLAB)</td>
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<tr>
<td>! MATH 12002</td>
<td>ANALYTIC GEOMETRY AND CALCULUS I (KMCR)</td>
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<tr>
<td>! UC 10001</td>
<td>FLASHES 101</td>
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**Credit Hours:** 14

### Semester Two

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<td>or</td>
<td>HONORS GENERAL CHEMISTRY II (KBS)</td>
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<td>CHEM 10971</td>
<td>GENERAL CHEMISTRY I LABORATORY (KBS) (KLAB)</td>
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<tr>
<td>! MATH 12003</td>
<td>ANALYTIC GEOMETRY AND CALCULUS II</td>
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<td>Kent Core Requirement</td>
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**Credit Hours:** 14

### Semester Three

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<tr>
<td>! CHEM 30481</td>
<td>ORGANIC CHEMISTRY I</td>
<td>3</td>
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<tr>
<td>! MATH 22005</td>
<td>ANALYTIC GEOMETRY AND CALCULUS III</td>
<td>4</td>
</tr>
<tr>
<td>! PHY 23101</td>
<td>GENERAL UNIVERSITY PHYSICS I (KBS) (KLAB)</td>
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**Credit Hours:** 16

### Semester Four

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<td>INTRODUCTION TO MATERIALS CHEMISTRY</td>
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<td>! CHEM 30301</td>
<td>INORGANIC CHEMISTRY I</td>
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<td>! CHEM 30476</td>
<td>ORGANIC CHEMISTRY LABORATORY II</td>
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<tr>
<td>! CHEM 30482</td>
<td>ORGANIC CHEMISTRY II</td>
<td>3</td>
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<tr>
<td>! PHY 23102</td>
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**Credit Hours:** 16

### Semester Five

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<th>Course Code</th>
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<tr>
<td>! CHEM 30105</td>
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<td>! CHEM 40302</td>
<td>INORGANIC CHEMISTRY II</td>
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<tr>
<td>! CHEM 40451</td>
<td>ORGANIC MATERIALS CHEMISTRY</td>
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<td>! CHEM 40555</td>
<td>PHYSICAL CHEMISTRY I</td>
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<td>Foreign Language</td>
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**Credit Hours:** 15

### Semester Six

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<tr>
<td>CHEM 40303</td>
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**Credit Hours:** 15

### semester Seven

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<td>! CHEM 40364</td>
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<tr>
<td>! CHEM 40556</td>
<td>PHYSICAL CHEMISTRY II</td>
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<tr>
<td>Foreign Language</td>
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**Credit Hours:** 13

### Semester Eight

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**Credit Hours:** 13

**Minimum Total Credit Hours:** 120

### University Requirements

All students in a bachelor's degree program at Kent State University must complete the following university requirements for graduation.

**NOTE:** University requirements may be fulfilled in this program by specific course requirements. Please see Program Requirements for details.

- **Flashes 101 (UC 10001)** 1 credit hour
- **Course is not required for students with 30+ transfer credits (excluding College Credit Plus) or age 21+ at time of admission.**
- **Diversity Domestic/Global (DIVD/DIVG)** 2 courses
  - Students must successfully complete one domestic and one global course, of which one must be from the Kent Core.
- **Experiential Learning Requirement (ELR)** varies
  - Students must successfully complete one course or approved experience.
- **Kent Core (see table below)**
  - Flashes 101 (UC 10001)
  - Writing-Intensive Course (WIC)
  - Upper-Division Requirement
  - Total Credit Hour Requirement
  - **Kent Core Requirements**
    - Kent Core Composition (KCMP) 6
    - Kent Core Mathematics and Critical Reasoning (KMCR) 3
    - Kent Core Humanities and Fine Arts (KHUM/KFA) (min one course each)
    - Kent Core Social Sciences (KSS) (must be from two disciplines)
    - Kent Core Basic Sciences (KBS/KLAB) (must include one laboratory)
    - Kent Core Additional (KADL)
    - **Total Credit Hours:** 36-37
Program Learning Outcomes

Graduates of this program will be able to:

1. Apply chemical knowledge to their profession.
2. Develop their abilities to plan and execute chemical experiments.
3. Prepare and deliver written and oral scientific reports.

Full Description

The Bachelor of Science degree in Chemistry is designed to provide a thorough foundation in the various fields of chemistry and the related sciences. The program is for students planning careers in the chemical industries or governmental laboratories, or who intend to do graduate work in chemistry. Students in the program have the opportunity to participate in an exchange program with the University of Leicester in England.

Chemistry students in specific concentrations may apply early to the M.S. degree in Chemistry and double count 9 credit hours of graduate courses toward both degree programs. See the Combined Bachelor's/Master's Degree Program policy in the University Catalog for more information.

The Chemistry major comprises the following concentrations:

- The **Chemistry** concentration is designed for students interested in careers as practicing chemists in industrial research and development, in government research laboratories or in academia. It includes a strong foundation in both chemistry and related disciplines (physics and mathematics) and provides opportunities to pursue advanced chemistry electives. This concentration meets the requirements for certification by the American Chemical Society and is ideal for students who plan to pursue graduate studies in chemistry.

- The **Industrial Chemistry** concentration provides solid background training in the major areas of chemistry, as well as practical training and related experiences in fields sought by local and regional chemical industries.

- The **Materials Chemistry** concentration is recommended for students interested in pursuing graduate study or industrial careers in materials science, including nanotechnology. Its requirements, similar to those of the traditional chemistry concentration, provide an opportunity for more in-depth study in the synthesis and characterization of inorganic and organic materials, including polymers.