CHEMISTRY - PH.D.

College of Arts and Sciences
Department of Chemistry and Biochemistry
www.kent.edu/chemistry

About This Program
The Ph.D. degree in Chemistry provides students with opportunities for research in the areas of analytical, inorganic, organic and physical chemistry, as well as biochemistry. Many of the research topics are built around interdisciplinary themes in biomedical research (bioanalytical, bioinorganic and biophysical chemistry) and materials science (nanomaterials, liquid crystals, photonic materials, spectroscopy, surface science).

Contact Information
- Erin Michael-McLaughlin | emmichae@kent.edu | 330-672-2032
- Connect with an Admissions Counselor: U.S. Student | International Student

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

Additional Careers
- Patent law
- Product development
- Formulation

* 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.

For more information about graduate admissions, visit the graduate admission website. For more information on international admissions, visit the international admission website.

Admission Requirements
- Bachelor's degree or higher from an accredited college or university
- Minimum 2.750 undergraduate GPA on a 4.000-point scale
- Official transcript(s)
- Goal statement
- Three letters of recommendation
- English language proficiency - all international students must provide proof of English language proficiency (unless they meet specific exceptions to waive) by earning one of the following:
  - Minimum 71 TOEFL iBT score
  - Minimum 6.0 IELTS score
  - Minimum 50 PTE score
  - Minimum 100 DET score

1 Completion of undergraduate courses consisting of one year each in analytical chemistry or biochemistry, organic chemistry, physical chemistry, calculus and physics is expected.
2 International applicants who do not meet the above test scores will not be considered for admission.

Application Deadlines
- **Fall Semester**
  - Priority deadline: December 15
- **Spring Semester**
  - Priority deadline: September 15

Applications submitted by these deadlines will receive the strongest consideration for admission.

Program Requirements

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CHEM 70994</td>
<td>COLLEGE TEACHING OF CHEMISTRY</td>
<td>1</td>
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<tr>
<td>CHEM 80898</td>
<td>RESEARCH</td>
<td>6-36</td>
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</table>

Approved Chemistry Lecture Electives
- 6

Chemistry Core Electives, choose from the following:
- 9

Analytical Chemistry

<table>
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<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>CHEM 70109</td>
<td>BIOANALYTICAL CHEMISTRY</td>
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<tr>
<td>CHEM 70113</td>
<td>CHEMICAL SEPARATIONS</td>
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### CHEM 70115 Applications of Spectroscopy and Imaging

**Biochemistry**

- CHEM 70261 Biochemistry: Biomolecule Structure and Function
- CHEM 70262 Biochemistry: Metabolism and Gene Expression
- CHEM 70263 Physical Biochemistry

**Inorganic Chemistry**

- CHEM 70327 Modern Inorganic Chemistry
- CHEM 70352 Inorganic Materials Chemistry
- CHEM 70365 Biological Inorganic Chemistry

**Organic Chemistry**

- CHEM 70473 Stereoselective Organic Synthesis
- CHEM 70476 Spectroscopic Identification of Organic Compounds
- CHEM 70483 Intermediate Organic Chemistry
- CHEM 70485 Physical Organic Chemistry

**Physical Chemistry**

- CHEM 70541 Advanced Physical Chemistry
- CHEM 70563 Quantum Chemistry
- CHEM 70564 Computational Chemistry

**Chemistry Seminar Electives**, choose from the following: 4

- CHEM 72191 Seminar: Analytical Chemistry
- CHEM 72291 Seminar: Biochemistry
- CHEM 72391 Seminar: Inorganic Chemistry
- CHEM 72491 Seminar: Organic Chemistry
- CHEM 72591 Seminar: Physical Chemistry

**Chemistry Seminar in Development/Problem Solving Electives**, choose from the following: 4

- CHEM 70291 Seminar: Recent Developments in Biochemistry
- CHEM 70391 Seminar: Recent Developments in Inorganic Chemistry
- CHEM 70591 Seminar: Recent Developments in Physical Chemistry
- CHEM 71191 Seminar: Problem Solving in Analytical Chemistry
- CHEM 71491 Seminar: Problem Solving in Organic Chemistry

**Culminating Requirement**

- CHEM 80199 Dissertation I 1

**Minimum Total Credit Hours for Post-Baccalaureate Students** 90

**Minimum Total Credit Hours for Post-Master's Students** 60

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1 Each doctoral candidate, upon admission to candidacy, must register for CHEM 80199 for a total of 30 credit hours. It is expected that a doctoral candidate will continuously register for Dissertation I, and thereafter CHEM 80299, each semester, until all requirements for the degree have been met.

### Graduation Requirements

**Minimum Major GPA** 3.000

**Minimum Overall GPA**

### Program Learning Outcomes

Graduates of this program will be able to:

1. Demonstrate an improved knowledge of a specialization within chemistry.
2. Plan and execute chemical experiments.

### Candidacy for Degree

To be admitted to candidacy for the doctoral degree, the student must pass a written examination in the field of specialization. The form and time of the examinations are determined by the departmental Graduate Student Handbook. Those failing this examination may repeat the examination once. After passing the written examination, the student must present a detailed written proposal for their dissertation research.