

# CHEMISTRY - PH.D.

## College of Arts and Sciences

Department of Chemistry and Biochemistry

[www.kent.edu/chemistry](http://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

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- 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<sup>1</sup>
- 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:<sup>2</sup>
  - Minimum 71 TOEFL iBT score
  - Minimum 6.0 IELTS score
  - Minimum 50 PTE score
  - Minimum 100 DET score

<sup>1</sup> Completion of undergraduate courses consisting of one year each in analytical chemistry or biochemistry, organic chemistry, physical chemistry, calculus and physics is expected.

<sup>2</sup> 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

Code	Title	Credit Hours
<b>Major Requirements</b>		
CHEM 70894	COLLEGE TEACHING OF CHEMISTRY	1
CHEM 80898	RESEARCH	6-36

Approved Chemistry Lecture Electives	6
Chemistry Core Electives, choose from the following:	9
<b>Analytical Chemistry</b>	
CHEM 70109	BIOANALYTICAL CHEMISTRY
CHEM 70113	CHEMICAL SEPARATIONS
CHEM 70115	APPLICATIONS OF SPECTROSCOPY AND IMAGING
<b>Biochemistry</b>	
CHEM 70261	BIOCHEMISTRY: BIOMOLECULE STRUCTURE AND FUNCTION
CHEM 70262	BIOCHEMISTRY: METABOLISM AND GENE EXPRESSION
CHEM 70263	PHYSICAL BIOCHEMISTRY
<b>Inorganic Chemistry</b>	
CHEM 70327	MODERN INORGANIC CHEMISTRY
CHEM 70352	INORGANIC MATERIALS CHEMISTRY
CHEM 70365	BIOLOGICAL INORGANIC CHEMISTRY
<b>Organic Chemistry</b>	
CHEM 70473	STEREOSELECTIVE ORGANIC SYNTHESIS
CHEM 70476	SPECTROSCOPIC IDENTIFICATION OF ORGANIC COMPOUNDS
CHEM 70483	INTERMEDIATE ORGANIC CHEMISTRY
CHEM 70485	PHYSICAL ORGANIC CHEMISTRY
<b>Physical Chemistry</b>	
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
<i>Culminating Requirement</i>	
CHEM 80199	DISSERTATION I <sup>1</sup>
<b>Minimum Total Credit Hours for Post-Baccalaureate Students</b>	<b>90</b>
<b>Minimum Total Credit Hours for Post-Master's Students</b>	<b>60</b>

<sup>1</sup> 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.

## 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. The successful oral defense of this proposal and its acceptance by the advisory committee admits the student to candidacy for the Ph.D. degree.

## Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
-	3.000

## 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.