

Chemistry PhD

COLLEGE OF SCIENCE AND TECHNOLOGY

Learn more about the Doctor of Philosophy in Chemistry.

About the Program

The Chemistry graduate program is designed to provide a solid background in the chosen area of specialization. It emphasizes the acquisition of skills that enable students to gain further knowledge in their research and professional careers. For this reason, the Chemistry graduate degree program is research oriented, and seminar attendance and familiarization with the chemical literature are considered integral. The course requirements are comparatively light, although a wide variety of intermediate and advanced courses in related areas are offered. Students are encouraged to take courses, according to their research interests, in related areas such as Biology, Computer Science and Physics.

Time Limit for Degree Completion: 7 years

Campus Location: Main

Full-Time/Part-Time Status: The degree program can be completed on a full- or part-time basis.

Interdisciplinary Study: A Chemical Physics program is offered jointly with the Department of Physics.

Areas of Specialization: The Department of Chemistry offers programs leading to the MA and PhD degrees in Analytical Chemistry, Biochemistry, Inorganic Chemistry, Organic Chemistry and Physical Chemistry. Areas of specialization include environmental chemistry, materials and polymers, medicinal, nanoscience, photonics and surface science.

Job Prospects: The majority of students find employment in the chemical industry. Some go on to academic positions or positions in government laboratories.

Non-Matriculated Student Policy: Non-matriculated students are allowed to take up to 9 credits before admission into a degree program must be sought.

Financing Opportunities: The duties of a Teaching Assistant typically involve leading recitation sections and/or overseeing laboratories, as well as grading lab assignments, tests and quizzes, when applicable. After their first year, most students are supported by a research assistantship.

Admission Requirements and Deadlines

Application Deadline:

Fall: December 15

Spring: September 15

For Fall admissions, priority is given to applications submitted by December 15. Applications submitted after December 15 will be considered on a case-by-case basis for admissions and financial assistance.

Applications for Spring admission should be received by September 15. Note, however, that Spring admission is rare as coursework is designed to start in the Fall.

APPLY ONLINE to this graduate program.

Letters of Reference:

Number Required: 3

From Whom: Letters of recommendation should be obtained from faculty or people in industry who are familiar with the academic and/or research aptitude of the candidate.

Master's Degree in Discipline/Related Discipline: A master's degree is not required for admission into the PhD program.

Bachelor's Degree in Discipline/Related Discipline: A baccalaureate degree is required. Typically, the undergraduate degree has been earned in Chemistry, Biochemistry or a related field.

Statement of Goals: Identify your specific interest in Temple's program, research goals, future career goals, and academic and research achievements.

Standardized Test Scores:

GRE: Optional

Applicants who earned their baccalaureate degree from an institution where the language of instruction was other than English, with the exception of those who subsequently earned a master's degree at a U.S. institution, must report scores for a standardized test of English that meet these minimums:

- TOEFL iBT: 88
- IELTS Academic: 6.5
- PTE Academic: 60
- Duolingo: 110

Regardless of score, all international students are required to take a SPEAK test upon arrival at Temple.

Resume: Current resume required.

Writing Sample: Submission of research papers with the applicant as a co-author or any other material associated with the applicant's research aptitude is recommended.

Advanced Standing: Students who enter the PhD program, whether with or without a master's degree in Chemistry or a closely related field, may be considered for advanced standing. The Graduate Committee recommends the awarding of advanced standing on a case-by-case basis based on a review of graduate coursework completed at another institution. The credits must be equivalent to graduate chemistry coursework offered at Temple, and the student must have completed the course(s) with a grade of "B" or better. The maximum number of advanced standing credits awarded is 18.

Program Requirements

General Program Requirements:

Number of Credits Required Beyond the Baccalaureate: 36

Required Courses:

Code	Title	Credit Hours
Core Courses		
CHEM 5901	Responsibility and Ethics in Chemical Research	1
CHEM 8985	Teaching in Higher Ed:Phys Sci ¹	1
CHEM 9900	Seminar	2
CHEM 9901	Original Research Proposal Preparation	1
Core Courses by Area of Study ²		9
Chemistry Electives ³		9
Research Courses		13
CHEM 9991	Graduate Research Projects	
CHEM 9994	Preliminary Examination Preparation	
CHEM 9998	Pre-Dissertation Research / Elevation to Candidacy	
CHEM 9999	Dissertation Research ⁴	
Total Credit Hours		36

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Students seeking a career in an academic setting are encouraged to take CHEM 8985 for 3 credits so they can earn the Teaching in Higher Education graduate certificate offered by the Center for the Advancement of Teaching at Temple University. Those who choose this option take two fewer credits of CHEM 9991 or CHEM 9994. Part-time students and students not on assistantship are exempted from the requirement to take CHEM 8985, and may instead take an additional credit of CHEM 9991 or CHEM 9994.

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Areas of study include Analytical Chemistry, Biochemistry, Inorganic Chemistry, Organic Chemistry and Physical Chemistry. See the course grid below for the core courses offered in each area.

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Chemistry electives may include any courses numbered CHEM 5001-9800 (excluding CHEM 5901 and CHEM 8985), and may include BCMS 5003 Fundamentals of Biochemistry or MEDS 5003 Fundamentals of Biochem, BMSC 8702 Enzymes and Proteins, EES 5625 Electron Optical Techniques, MEE 5205 Microscopy and Microanalysis of Materials, and/or PHYS 5000 Topical Seminar. Additional course substitutions may be made with approval of the Graduate Committee.

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Students must complete a minimum of 2 credits of CHEM 9999.

Core Courses by Area of Study

Code	Title	Credit Hours
Analytical Chemistry		9
CHEM 5305	Chemical Kinetics	
Select two courses from the following:		
CHEM 5201	Physical Methods in Organic Chemistry	
CHEM 8310	Special Topics in Analytical Chemistry (Mass Spectroscopy)	
CHEM 8601	Analytical Separations	
EES 5625	Electron Optical Techniques	
Biochemistry		9
CHEM 5401	Biochemistry I	
Select two courses from the following:		
BCMS 5003 or MEDS 5003	Fundamentals of Biochemistry Fundamentals of Biochem	
BMSC 8702	Enzymes and Proteins	
CHEM 8400	Special Topics in Biochemistry (Nucleic Acids)	
CHEM 8401	Bioinorganic Chemistry	
Inorganic Chemistry		9
CHEM 5001	Advanced Inorganic Chemistry I	
CHEM 5201	Physical Methods in Organic Chemistry	
CHEM 8401	Bioinorganic Chemistry	
Organic Chemistry		9
CHEM 5201	Physical Methods in Organic Chemistry	
CHEM 5202	Organic Reaction Mechanisms	
CHEM 5205	Organic Syntheses	
Physical Chemistry		9
CHEM 5301	Quantum Chemistry	
CHEM 5302	Statistical Thermodynamics	
CHEM 5305	Chemical Kinetics	

Culminating Events:

Literature Seminar:

The PhD student makes the presentation of one departmental seminar on a current literature topic or their research, as approved by the seminar professor. The seminar is 30 minutes in length and should include any background material needed to allow the audience to appreciate the topic(s) discussed.

Cumulative Examinations:

Cumulative examinations are a major part of the preliminary examinations. Written by the Graduate Faculty, cumulative examinations are offered seven times a year. Each cumulative examination is evaluated by at least two Graduate Faculty members. Students must pass a total of five "cumes" within the first two years of matriculation.

Original Research Proposal:

To obtain PhD candidacy, the student is required to write, present and defend an Original Research Proposal (ORP). The topic of the ORP can be related to the student's research, but must still be original. The proposal is an opportunity for the student to use their scientific knowledge to demonstrate their ability to formulate experiments, calculations, theory and the like to address an important scientific problem. The ORP should also contain a description of the actual research that the student will pursue for their PhD.

The student must consult with their research advisor for guidance prior to writing the ORP. It is understood by writing this document that a general experience in research will help evolve new chemistry through observations made during the course of an ongoing research problem. The ORP needs to be defended within 30 months of matriculation.

Dissertation:

The doctoral dissertation is an original study that makes a significant contribution to the field of Chemistry. It should expand the existing knowledge and demonstrate the student's knowledge of research methods and a mastery of their primary area of interest. The dissertation should be rigorously investigated; uphold the ethics and standard of the field of Chemistry; demonstrate an understanding of the relationship between the primary area of interest and the broader field of Chemistry; and be prepared for publication in a professional journal.

The Doctoral Advisory Committee is formed to oversee the student's doctoral research and is comprised of at least three Graduate Faculty members. Two members, including the Chair, must be from the Chemistry Department. Committee compositions must be approved by the Graduate Committee. The Chair is responsible for overseeing and guiding the student's progress, coordinating the responses of the Committee members, and informing the student of their academic progress.

The Dissertation Examining Committee evaluates the student's dissertation and oral defense. This committee is comprised of the Doctoral Advisory Committee and at least one additional Graduate Faculty member from outside the Chemistry Department. The Outside Examiner should be identified no later than the beginning of the academic term in which the student will defend the dissertation. The Dissertation Examining Committee evaluates the student's ability to express verbally their research question, methodological approach, primary findings and implications. The Committee votes to pass or fail the dissertation and the defense.

If a student needs to change a member of a Committee, the new member must be approved by the department's Graduate Committee and registered with the department and the Graduate School.

Students who are preparing to defend their dissertation should confirm a time and date with their Dissertation Examining Committee and register with the department at least 15 days before the defense is to be scheduled. The time, date and room are arranged within two working days, and the appropriate forms are forwarded to the student. After the defense has been scheduled, the student is required to send the Graduate School a completed "Announcement of Dissertation Defense" form, found in TUportal under the Tools tab within "University Forms," at least 10 days before the defense. The student posts flyers announcing the defense.

Contacts

Program Web Address:

<https://www.temple.edu/academics/degree-programs/chemistry-phd-st-chem-phd>

Department Information:

Dept. of Chemistry
130 Beury Hall
1901 N. 13th Street
Philadelphia, PA 19122-6014
chemgrad@temple.edu
215-204-7118

Submission Address for Application Materials:

<https://cst.temple.edu/academics/graduate-programs/apply-now>

Department Contacts:

Admissions:
Graduate Secretary
chemgrad@temple.edu
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Department Chairperson:
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