

CHEMISTRY (PHD)

Doctoral study in Chemistry at Loyola University Chicago is designed to develop within students the foundational skills for industrial work, academic research, and teaching careers in diverse learning communities. The department of chemistry offers opportunities for graduate study in sub-fields of chemistry such as Physical & Surface Chemistry, Medicinal Chemistry, Theoretical Chemistry, Biochemistry and Chemical Education.

Related Programs

Master's

- Biochemistry and Molecular Biology (MS) (<https://catalog.luc.edu/graduate-professional/graduate-school/health-sciences/biomedical-sciences/biochemistry-molecular-biology-ms/>)
- Chemistry (MS) (<https://catalog.luc.edu/graduate-professional/graduate-school/arts-sciences/chemistry-biochemistry/chemistry-ms/>)

Combined

- Biochemistry (BS/MS) (<https://catalog.luc.edu/undergraduate/accelerated-bachelors-masters-program/biochemistry-bsms/>)

Curriculum

The PhD in Chemistry requires 60 credit hours earned through 6 (six) required courses and 42 credit hours of research in their sub-field, as well as an entrance examination, comprehensive examination, and dissertation. Students may choose a specialization in Analytical Chemistry, Biochemistry, Chemistry Education, Inorganic Chemistry, Organic Chemistry, or Physical Chemistry.

PhD Students will complete entrance exams, a comprehensive exam and then propose and defend research towards the dissertation.

Code	Title	Hours
CHEM 401	Chemistry Methodology and Communication	3
Select at least One Course in Area of Specialization		3
<i>Analytical</i>		
CHEM 455	Special Topics in Analytical Chemistry ¹	
<i>Biochemistry</i>		
CHEM 465	Special Topics in Biochemistry ²	
CHEM 470	Biochemistry I	
<i>Education</i>		
CHEM 480	Chemistry for Teachers I	
<i>Inorganic</i>		
CHEM 441	Advanced Inorganic Chemistry	
CHEM 445	Special Topics in Inorganic Chemistry ³	
<i>Organic</i>		
CHEM 422	Advanced Organic Chemistry III: Mechanism	
CHEM 423	Medicinal Chemistry	
CHEM 424	Molecular Characterization Part A	
CHEM 425	Special Topics in Organic Chemistry ⁴	
<i>Physical</i>		
CHEM 435	Special Topics in Physical Chemistry ⁵	
Select Four Graduate Electives		12
Research in Specialization		42

CHEM 610	Doctoral Study	0
CHEM 600	Dissertation Supervision	0
Total Hours		60

- ¹ Must choose from one of the following: Archeometry and Adv Analytical Chemistry.
- ² For CHEM 465 choose from one of the following: Plant Biochemistry; The Chemistry of Enzymes; Biochem of Lipids; Adv Approaches in Biochemistry; Adv Enzyme Kinetics and Mech; Molecular Immunology; Biochem of Renewable Energy; and Proteomics;
- ³ For CHEM 445 choose from one of the following: Molecular Characterization Part B; Medicinal Inorganic Chem; and Electron and X-Ray Methods.
- ⁴ For CHEM 425 choose from one of the following: Orgo Structure Determination; Strategy & Tactics or Org Chem; Func Dyes Biomed Imaging; Adv Orgo-Synthesis and Mech; Comp Organomet Chem; and Advanced Organic Synthesis;
- ⁵ For CHEM 435 choose from one of the following: Exp Tech of Surface Science; Survey of Modern Physical Chemistry; Surface Chem and Analysis; Thermodynam/ Protein Structures; and Computational Chemistry;

Responsible Conduct of Research

All PhD students and students in thesis-based Master's degree programs must successfully complete UNIV 370 Responsible Conduct in Research and Scholarship or other approved coursework in responsible conduct of research as part of the degree requirements. It is strongly recommended that students complete this two-day training before beginning the dissertation/thesis stage of the program.

Graduate & Professional Standards and Regulations

Students in graduate and professional programs can find their Academic Policies in Graduate and Professional Academic Standards and Regulations (<https://catalog.luc.edu/academic-standards-regulations/graduate-professional/>) under their school. Any additional University Policies supersede school policies.

Learning Outcomes

- Trained in necessary lab protocol (notebooks, design of experiment, safety, etc.), effective communication of science, and job function (intellectual property, regulatory, ethics, etc.) necessary for careers with an advanced degree.
- To be able to educate students interested in chemical sciences.
- Develop capabilities to solve fundamental problems on advanced topics in chemistry sub-disciplines relevant to their field of study.
- To be able to effectively design and carry out independent research leading to new knowledge or a practical, applicable result. This includes mastery of gathering, organizing, analyzing, and reporting data.