CHEMISTRY, PH.D.

Credits: 72
CIP Code: 400501

Program Overview

The **Doctor of Philosophy Degree in Chemistry** is for those students that wish to gain the skills to propose and conduct research in Chemistry.

Admissions Requirements

Program Objectives

1. Emphasize the multidisciplinary aspects of physical and molecular sciences.
2. Promote the development of the skills required for scientific inquiry, writing and presentation.
3. Provide opportunities for students to gain academic teaching and research experiences that will prepare them for scholarly and productive endeavors.
4. Train scientists and scholars to perceive fundamental problems in areas of chemistry; and to investigate them successfully.
5. Prepare Ph.D. level students for postdoctoral research or academic teaching positions in academic, scientific or other industries.

Student Learning Outcomes

Students pursuing the **Doctor of Philosophy Degree in Chemistry** will:

1. Conduct independent and collaborative research to prepare proposals for fellowship and funding, and scientific articles in peer-reviewed journals.
2. Communicate effectively scientific research in written and oral formats to scientific and non-scientific audiences at professional conferences and other academic venues.
3. Teach laboratory classes in introductory chemistry.
4. Practice professional ethical standards in the conduct of scientific experiment, inquiry, scholarly research and teaching.

Degree Requirements

In addition to the General Degree Requirements as published in this Catalog, students pursuing the **Doctor of Philosophy Degree in Chemistry** are required to complete a minimum of forty-two (42) graduate credits in residence. Minimum departmental degree requirements are core course requirements plus additional coursework as defined by the division: analytical, physical, inorganic, organic, polymer or biochemistry.

Code	Title	Hours
Required Core Courses		
CCHE 521	Advanced Inorganic Chemistry	3
CCHE 531	Mechanistic Organic Chem I	3
CCHE 541	Thermodynamics	3
CCHE 512	Instrumental Methods	3
CCHE 542	Quantum Mechanics	3
CCHE 532	Organic Synthesis	3
Area of Concentration Core		
Select courses per area of concentration:		3-9
Organic Chemistry Concentration		
CCHE 533	Physical Organic Chemistry	
Biochemistry Concentration		
CCHE 551	Advanced Biochemistry I	
CCHE 552	Advanced Biochemistry II	
Polymer Concentration		
CCHE 571	Intro to Polymer Chemistry	
CCHE 572	Techniques in Polymer Chem	
CCHE 573		
Electives		
Select up to six credits depending on the concentration		6
Total Hours		**27-33**

Research Dissertation: Variable Credits

Depending on the concentration

Qualifying Examinations

1. *For Bachelor's Degree Entrants:* Three General Qualifying Examinations and one Advanced Qualifying Examination by the end of the second year. Qualifying Examinations in the field of specialization by the end of the third year.
2. *For Master's Degree Entrants:* An advanced Qualifying Examination by the end of the first year. Qualifying Examinations in the field of specialization by the end of the second year.
3. *For Biochemistry Majors:* Exemption from the general comprehensive examination in inorganic chemistry.

Independent Proposal Requirement

All students must produce and successfully defend an independent research proposal in an area that is not equivalent to their area of research.

Final Examination

- The final examination is the production and successful defense of the research

(Organic) Chemistry, Ph.D.

Course	Title	Hours
First Year		
First Semester		
CCHE 521	Advanced Inorganic Chemistry	3
CCHE 531	Mechanistic Organic Chem I	3
CCHE 541	Thermodynamics	3
	Hours	**9**
Second Semester		
CCHE 512	Instrumental Methods	3
CCHE 542	Quantum Mechanics	3
CCHE 532	Organic Synthesis	3
	Hours	**9**
Third Semester		
CCHE 7X0	Research in Chemistry	6
	Hours	**6**
Second Year		
First Semester		
CCHE 533	Physical Organic Chemistry	3
CCHE 7X0	Research in Chemistry	6
	Hours	**9**

Second Semester		
CCHE 637	Adv Topic in Organic Chemistry	3
CCHE 7X0	Research in Chemistry	6
	Hours	**9**
Third Semester		
CCHE 7X0	Research in Chemistry	6
	Hours	**6**
Third Year		
First Semester		
CCHE 7X0	Research in Chemistry	9
CCHE 508	Seminar in Chemistry [1]	0
	Hours	**9**
Second Semester		
CCHE 508	Seminar in Chemistry [1]	1
CCHE 901	Dissertation Consultation	1
CCHE 7X0	Research in Chemistry	7
	Hours	**9**
	Total Hours	**66**

[1] Required of all graduate students and must be taken for two semesters to earn one hour of credit.