

Chemistry

College of Arts & Sciences

The Department of Chemistry offers the Master of Science and the Doctor of Philosophy degrees. Plan A or B may be used to satisfy the requirements for the M.S. degree. Areas of specialization in chemistry are analytical, biological, inorganic, organic, physical, and radionuclear. All candidates for the Ph.D. degree are required to serve as a teaching assistant for one semester.

Admission Requirements

Apart from the admissions standards set for all departments by the [Graduate School](#), the only specific departmental requirement for admission to the Graduate Program in Chemistry is an undergraduate degree in chemistry or its equivalent (with sufficient sampling of courses pertaining to the main chemistry disciplines). The Chemistry Department asks applicants to submit three letters of recommendation, and considerable weight in each admission decision is given to these written evaluations from the applicant's instructors and mentors. A list of unofficial metrics used to rank applications can be found at the [Chemistry Department's Admission webpage](#). Teaching Assistantships are generally only offered to entering students seeking the Ph.D. degree; entering applicants targeting a M.S. degree are usually not offered financial support. An effort is made to match applicant interests with available research programs. Applicants for whom exceptions to the above-stated policies seem warranted are subject to special consideration by the Graduate Recruitment Committee. As part of the course requirements for both the M.S. and the Ph.D. degrees, all students must normally take four "core" courses. The student selects one course which best meets career objectives in each of four of the five areas of chemistry (analytical, biological, inorganic, organic, and physical) from a pair of such courses: CHE 524 or 626, CHE 550 or 552, CHE 510 or 514, CHE 535 or 538, CHE 547 or 548, respectively.

All new graduate students must take proficiency examinations in analytical, biological, inorganic, organic, and physical chemistry. The results of these examinations are used as a guide in establishing the student's program of courses. Students who do very well on any particular examination may bypass the core course in that area.

Doctor of Philosophy

Doctoral degrees are earned in the Department of Chemistry after a student has carried out productive and independent research on a problem that is of significant chemical interest. It is expected that the results of the dissertation work will be published in refereed scientific journals. All Graduate School requirements must be met. Subject to approval of the student's Advisory Committee, course work for the Ph.D. degree shall normally include four "core" courses and 8 credits of advanced or specialty courses. At least 3 credit hours must be in courses outside of the student's main area of interest.

The Qualifying Examination consists of a written and an oral part. The written component of the Qualifying Examination consists of a series of cumulative examinations designed to test the application of fundamental principles and reasoning to literature or research problems. Scores of 3, 2, 1, or 0 can be obtained on each examination. Examinations in the areas of Analytical, Inorganic, Biological, Organic, and Physical Chemistry are given eight times per year, and a Ph.D. student must score eight points (with half of those points requiring a score of 2 or better) within two years in order to take the oral part of the Qualifying Examination.

Master of Science

Plan A (Thesis): All Graduate School requirements must be met. In addition to four “core” courses, advanced or specialty courses relevant to a student’s career objectives are taken to total a minimum of 24 credits. Successful defense of a thesis describing original research of a caliber that could result in publication in refereed scientific journals is required of all M.S. Plan A students.

Plan B (Non-Thesis): Students in the Department of Chemistry may satisfy the requirements for an M.S. degree by using Plan B, a coursework M.S. degree. Students wishing to follow this plan must present for the approval of the Graduate Program Committee a program of courses that satisfies the Committee and meets all Graduate School requirements. This program of courses must meet distribution requirements within four of the five areas of chemistry and include 6 or more credits of courses outside of Chemistry that are relevant to the student’s career goals.

For further information on any degree program in Chemistry, contact the Director of Graduate Studies at dgs.chemistry@uky.edu.

Graduate Courses

CHE 410g	Inorganic Chemistry	(2)
CHE 440g	Physical Chemistry I	(4)
CHE 442g	Physical Chemistry II	(3)
CHE 446g	Physical Chemistry For Engineers	(3)
CHE 510	Advanced Inorganic Chemistry	(3)
CHE 514	Descriptive Inorganic Chemistry	(3)
CHE 524	Chemical Instrumentation	(4)
CHE 526	Chemical Separations	(2)
CHE 532	Spectrometric Identification Of Organic Compounds	(2)
CHE 535	Synthetic Organic Chemistry	(3)
CHE 538	Principles Of Organic Chemistry	(3)
CHE 547	Principles Of Physical Chemistry I	(3)
CHE 548	Principles Of Physical Chemistry II	(3)
CHE 550	Biological Chemistry I	(3)
CHE 552	Biological Chemistry II	(3)
CHE 553	Chemistry And Molecular Biotechnology	(3)
CHE 555	Homonuclear Nmr	(3)
CHE 558	Hormone Receptors And Cell Signals	(3)
CHE 559	Intermolecular Forces: From Molecules To Materials	(3)
CHE 565	Environmental Chemistry	(3)
CHE 580	Topics In Chemistry	(1-3)
CHE 610	Chemistry Of The Transition Metals	(3)
CHE 612	Inorganic Chemistry Of The Non-Metals	(3)
CHE 614	Organotransition Metal Chemistry	(3)
CHE 616	Nuclear Chemistry	(3)
CHE 620	Electrochemical Methods Of Analysis	(3)
CHE 623	Chemical Equilibrium And Data Analysis	(3)
CHE 625	Optical Methods Of Analysis	(3)
CHE 626	Advanced Analytical Chemistry	(3)
CHE 633	Physical Organic Chemistry	(3)
CHE 640	Chemical Crystallography	(3)
CHE 643	Spectroscopy And Photophysics	(3)

CHE 646	Chemical Kinetics	(3)
CHE 666	Proteomics And Mass Spectrometry	(3)
CHE 668	Symmetry And Chemical Applications	(3)
CHE 710	Topics In Inorganic Chemistry	(2-4)
CHE 736	Topics In Organic Chemistry	(2-4)
CHE 746	Topics In Physical Chemistry	(2-4)
CHE 748	Master’s Thesis Research	(0)
CHE 749	Dissertation Research	(0)
CHE 767	Dissertation Residency Credit	(2)
CHE 768	Residence Credit For The Master’s Degree	(1-6)
CHE 769	Residence Credit For The Doctor’s Degree	(0-12)
CHE 772	Seminar In Chemistry Instruction	(1)
CHE 776	Graduate Seminar	(1)
CHE 779	Membrane Sciences Colloquium (Same As Cme/Phr/Bch/Pha 779)	(1)
CHE 780	Individual Work In Chemistry	(1-5)
CHE 790	Research In Chemistry	(1-12)