

Graduate Programs in Chemistry

The Department of Chemistry at Wichita State offers courses of study leading to the Master of Science (MS) and the Doctor of Philosophy (PhD) degrees in the areas of biochemistry and analytical, inorganic, organic, physical, and polymer chemistry.

Admission Requirements

To enroll in the graduate program in chemistry, students must follow the admission procedures required by the Graduate School. The chemistry department requires a baccalaureate degree in chemistry, a grade point average of at least 3.000/4.000 (both overall and in chemistry), two letters of recommendation from individuals familiar with the applicant's academic background, a one-page typed statement of goals and research interests, and submission of test scores from the general GRE exam. The department strongly recommends test scores from the chemistry subject GRE as well. International students must have a minimum TOEFL score of 550 (paper based), 213 (computer based), or 79 (internet based), OR a minimum overall band score of 6.5 on the IELTS exam. Applicants whose transcripts do not explicitly list the chemistry courses which they have taken must submit an official description of the courses which comprise their chemistry degree. Students deficient in any of the requirements may be admitted conditionally providing they follow the specified procedures required to remove any deficiencies.

Applications are reviewed as completed throughout the year.

Assessment Exam Requirements

All entering Master of Science and Doctor of Philosophy students are required to take analytical, inorganic, organic and physical chemistry and biochemistry assessment exams in their first semester in the program. Both MS and PhD students must receive a pass or remove deficiencies in four of the subject areas listed above within the first year in the program. Deficiencies may be removed by enrolling in an appropriate course designated by the Graduate Affairs Committee and pass it with a *B* or better grade or retake and pass the assessment exam in the area of the deficiency. Assessment exams are given three times a year – fall, spring and summer.

Doctor of Philosophy Requirements

All PhD students are required to take 24 hours of graduate chemistry courses comprised of core courses and focused courses. The required core courses for the PhD include CHEM 715, CHEM 719,

CHEM 721, CHEM 723 and CHEM 734. The remaining nine hours may be satisfied by CHEM 717 and/or 2-3 focused courses numbered above 701. Students must complete two enrollment in CHEM 700 and must enroll in CHEM 701 each semester of the degree program. Students must pass six cumulative examinations out of 16 attempts to remain in the program. During their fifth semester, students must develop and orally defend an original research proposal. After passing the cumulative exams and successfully defending the original research proposal, the student will have qualified as a candidate for the PhD in Chemistry and must be enrolled in at least 2 hours of CHEM 990 each semester for the duration of the program. The final requirement of the degree is the defense of a dissertation based on original research. Well-prepared entering students should be able to complete the requirements within four years.

Dissertation. The dissertation is reviewed by a committee from the department, and an oral examination given by a faculty committee appointed by the Graduate School must be passed. Students must select a faculty member to be their research advisor by the beginning of their second semester in the graduate program.

Students in the PhD program in good standing, who have completed all required courses, have satisfactorily presented their Departmental Research Seminar, have defended their Creative Research Proposal, and have satisfied all other requirements for admittance to candidacy for the PhD degree, will upon request and approval by the student's committee be awarded the MS degree.

Master's Degree Requirements

The MS degree in chemistry requires the completion of 30 credit hours, including the presentation of a thesis based on original research. The program requires at least 6 credit hours in research, CHEM 890. Also, at least 15 credit hours in chemistry courses numbered above 701 must be taken, including CHEM 734 and at

least three of the graduate chemistry core courses (715 – 723). Students must complete one enrollment in CHEM 700 and must enroll in CHEM 701 each semester of their degree program. Additional courses are selected by students in consultation with their advisor and the department's Graduate Affairs committee.

Thesis. The thesis is reviewed by a committee from the department, and an oral examination given by a faculty committee appointed by the Graduate School must be passed. Students must select a faculty member to be their research advisor by the beginning of their second semester in the graduate program.

Financial Support

Graduate teaching assistantships are available to qualified students. Faculty members may support students in their research groups from research grants. Graduate students in chemistry are also eligible to receive the B.L. Parker Endowed Fellowship in Chemistry.

The department is committed to supporting PhD students for up to five years and MS students for up to two years as they pursue completion of degree requirements. Satisfactory performance ensures continuing annual financial support.

Faculty

James G. Bann, Associate Professor, PhD, Oregon Health Sciences University. Biochemistry: mechanism of folding and export of adhesive organelles from pathogenic bacteria; protein structure and function relationships; application of ¹⁹F-NMR to studies of protein conformation.

Moriah R. Beck, Assistant Professor, PhD, Washington University in St. Louis. Biochemistry: structural biology; actin binding proteins and regulation of actin polymerization kinetics; biophysical characterization of protein-protein interactions; biomolecular NMR.

Dennis H. Burns, Professor, PhD, University of California – Davis. Organic chemistry: supramolecular chemistry and molecular recognition: preparation and study of anion receptors; preparation of novel antibiotics that contain anion receptors that bind to anionic phospholipid headgroups found in bacterial membranes; development of new strategies, methodologies and reagents for the synthesis of large molecules able to be used in molecular devices; chemistry of porphyrins and chlorins.

David M. Eichhorn, Department Chair, Professor, PhD, University of California, Berkeley. Inorganic chemistry: metalloenzyme model complexes; conductive and magnetic metal-organic materials; ligand effects on electronic structure; cyano-substituted scorpionate ligands.

Douglas S. English, Associate Professor, PhD, Iowa State University. Physical and materials chemistry; fluorescence spectroscopy and microscopy, single-molecule detection and fluorescence correlation spectroscopy, novel applications in colloids and nanoscience, protein interactions at bilayer interfaces.

William C. Groutas, WSU Foundation Distinguished Professor of Chemistry, PhD, University of Kentucky. Bioorganic and medicinal chemistry: design and synthesis of enzyme inhibitors; mechanistic enzymology; combinational chemistry.

D. Paul Rillema, Professor, PhD, Michigan State University. Inorganic chemistry: catalysis; relationship of molecular structure to photoelectron transfer; design of supramolecular complexes; photophysical and photochemical properties of coordination compounds; solar energy conversion; donor-acceptor compounds.

Erach R. Talaty, Research Professor and Assistant Chair, PhD (physical), Nagpur University; PhD (organic), Ohio State University. Organic chemistry: small-ring compounds; steroids; synthesis of potential anti-cancer agents; theoretical studies; heterocyclic chemistry; reaction mechanisms; models to test mode of action of drugs; mass spectrometry studies.

Kandatege Wimalasena, Professor, PhD, Georgia Institute of Technology. Biochemistry: molecular mechanisms of regulation of catecholamine neurotransmitter biosynthesis and metabolism; mechanistic enzymology of the catecholamine biosynthetic pathways; chemistry and biochemistry of ascorbic acid (Vitamin C); oxidative stress and neurodegenerative diseases.

For more information

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