Chemistry

Degrees Offered

- Master of Science (Chemistry; thesis and non-thesis options)
- Doctor of Philosophy (Applied Chemistry)

Program Description

The Department of Chemistry offers MS (thesis and non-thesis options) in Chemistry and PhD degrees in Applied Chemistry. In addition, interdisciplinary MS and PhD degrees are also offered in Geochemistry, Hydrological Sciences and Engineering, Materials Science, Nuclear Engineering, and Quantitative Biosciences and Engineering.

Prerequisites

A candidate for an advanced degree in the Chemistry program should have completed an undergraduate program in Chemistry which is essentially equivalent to that offered by the Department of Chemistry at Colorado School of Mines. Undergraduate deficiencies will be determined by faculty in the Department of Chemistry through interviews and/or placement examinations at the beginning of the student's first semester of graduate work.

Required Curriculum

Chemistry

A student in the chemistry program, in consultation with the advisor and thesis committee, selects the program of study. Initially, before a thesis advisor and thesis committee have been chosen, the student is advised by a temporary advisor and by the Graduate Affairs Committee in the Department of Chemistry.

Master of Science

MS Degree (Chemistry, thesis option): The program of study includes coursework, research, and the preparation and oral defense of an MS thesis based on the student's research. The required courses are:

CHGN502	ADVANCED INORGANIC CHEMISTRY	3.0
CHGN503	ADV PHYSICAL CHEMISTRY I	3.0
CHGN505	ADVANCED ORGANIC CHEMISTRY	3.0
CHGN507	ADVANCED ANALYTICAL CHEMISTRY	3.0
CHGN560	GRADUATE SEMINAR (M.S.-level seminar)	1.0

A minimum of 30 credits, including at least 18 credits of coursework, is required. At least 15 of the required 18 credits of coursework must be taken in the Department of Chemistry at Mines. Only one credit of CHGN560 may be applied to the 18-credit coursework requirement. The total hours of coursework required are determined on an individual basis by the student's thesis committee.

Research-Intensive MS Degree: Mines undergraduates who enter the graduate program through the combined BS/MS program may use this option (thesis-based MS) to acquire a research-intensive MS degree by minimizing the time spent on coursework. This option requires a minimum of 12 hours of chemistry-focused coursework up to 6 hours of which may be double counted from the student's undergraduate studies at Mines (see below). Only one credit of CHGN560 may be applied to the 12-credit coursework requirement.

MS Degree (Chemistry, non-thesis option): The non-thesis MS degree requires 30 credits:

Course work	24.0
Independent study	6.0
Total Semester Hrs	**30.0**

The program of study includes coursework, independent study (CHGN 699) on a topic determined by the student and the student's faculty advisor, and the preparation of an oral presentation and of a report based on the student's independent study topic. The independent study could take the form of an off-campus internship under supervision of the student's advisor. As part of the 24 credits of required coursework, students must complete CHGN560 as well as three of the four core courses (CHGN502, CHGN503, CHGN505, CHGN507; 3 credits each).

CHGN502	ADVANCED INORGANIC CHEMISTRY	3.0
CHGN503	ADV PHYSICAL CHEMISTRY I	3.0
CHGN505	ADVANCED ORGANIC CHEMISTRY	3.0
CHGN507	ADVANCED ANALYTICAL CHEMISTRY	3.0
CHGN560	GRADUATE SEMINAR (M.S.-level seminar)	1.0

All credits received for CHGN560 may count towards the coursework requirement for the non-thesis MS degree. At least 21 of the required 30 credits must be taken as a registered master's degree student at Mines. Up to 9 credits of graduate courses may be transferred into the degree program, provided that those courses have not been used as credit toward a Bachelor's degree. The student's committee makes decisions on courses to be taken and transfer credit and examines the student's written report and oral presentation resulting from the independent study.

Dual Degree Program Option: Students have the opportunity to earn two degrees with the dual degree option. Students complete coursework to satisfy requirements for both a non-thesis MS in Chemistry from the Colorado School of Mines and a Master of Science of Physical Chemistry and Chemical Physics from the University of Bordeaux.

Seminar requirement. All MS students are required to give a passing 20-minute CHGN560 seminar, graded by a faculty committee, before graduation. Full-time MS students are generally expected to maintain continuous enrollment in CHGN560 and are required to attend seminars.

Mines' Combined Undergraduate / Graduate Degree Program

Students enrolled in Mines' combined undergraduate/graduate program may double count up to 6 credits of graduate coursework to fulfill requirements of both their undergraduate and graduate degree programs. These courses must have been passed with B- or better, not be substitutes for required coursework, and meet all other university, department, and program requirements for graduate credit.

Students are advised to consult with their undergraduate and graduate advisors for appropriate courses to double count upon admission to the combined program.

PhD Degree (Applied Chemistry)

The program of study for the PhD degree in Applied Chemistry includes coursework, a comprehensive examination, a thesis proposal, research, and the preparation and oral defense of a PhD thesis based on the

student's research. The Doctor of Philosophy requires 72 credits beyond the bachelor's degree.

Coursework. The required courses are:

CHGN502	ADVANCED INORGANIC CHEMISTRY	3.0
CHGN503	ADV PHYSICAL CHEMISTRY I	3.0
CHGN505	ADVANCED ORGANIC CHEMISTRY	3.0
CHGN507	ADVANCED ANALYTICAL CHEMISTRY	3.0
CHGN560	GRADUATE SEMINAR	2.0
Total Semester Hrs		**14.0**

PhD students must receive at minimum a B in required core classes; students who receive a B- or lower need to demonstrate subject competency to continue in the PhD program. At least 18 credits of coursework are required for the PhD degree. PhD students can count two credits of CHGN560 toward their coursework requirement. The total hours of course work required are determined on an individual basis by the student's thesis committee. Up to 24 credits of graduate-level coursework may be transferred from other institutions toward the PhD degree provided that those courses have not been used by the student toward a bachelor's degree. Up to 36 credits may be transferred if the student has completed a master's degree. The student's thesis committee may set additional course requirements and will make decisions on requests for transfer credit.

Comprehensive examination. The comprehensive examination comprises a written literature review of the student's field of research, an oral presentation of the literature review, and oral answers to questions posed by the audience members and the student's thesis committee. The literature review must be completed prior to the end of the student's fourth academic-year semester in the graduate program. A student's thesis committee may, at its discretion, require additional components to the comprehensive examination process.

Seminar requirement. Full-time PhD students are expected to maintain continuous enrollment in CHGN560 and attend seminars for four years, and should give a 40-minute seminar, graded by a faculty committee, before the end of their sixth academic-year semester in the program. They are also expected to give a conference presentation or a second public seminar before graduation.

Thesis proposal. A written thesis proposal must be presented to and approved by the student's thesis committee during the student's fourth year in the program or approximately one year before the anticipated thesis defense date, whichever comes earlier. The thesis proposal document should be a 2000 to 2500 word document including an introduction describing the significance and context of the thesis topic, a chapter-by-chapter description of research questions and findings, and a visual timeline specifying timeframes for data collection, analysis, and write-up of each chapter. The presentation should be 30 to 40 minutes long and is followed by questions from the general audience and the student's thesis committee. The document must be submitted at least a week prior to the scheduled presentation.

Geochemistry

Please see the Geochemistry section of this bulletin for more information.

Courses

CHGN502. ADVANCED INORGANIC CHEMISTRY. 3.0 Semester Hrs.
Detailed examination of concepts such as molecular symmetry, group theory, molecular orbital theory, ligand field theory, and crystal field theory. Additional topics include spectroscopy, inorganic reaction mechanisms, and organometallic chemistry.

CHGN503. ADV PHYSICAL CHEMISTRY I. 3.0 Semester Hrs.
(II) Quantum chemistry of classical systems. Principles of chemical thermodynamics. Statistical mechanics with statistical calculation of thermodynamic properties. Theories of chemical kinetics. 3 hours lecture; 3 semester hours. Prerequisite: none.

CHGN505. ADVANCED ORGANIC CHEMISTRY. 3.0 Semester Hrs.
Detailed discussion of the more important mechanisms of organic reaction. Structural effects and reactivity. The application of reaction mechanisms to synthesis and structure proof. Prerequisite: none. 3 hours lecture; 3 semester hours.

CHGN507. ADVANCED ANALYTICAL CHEMISTRY. 3.0 Semester Hrs.
(I) Review of fundamentals of analytical chemistry. Literature of analytical chemistry and statistical treatment of data. Manipulation of real substances; sampling, storage, decomposition or dissolution, and analysis. Detailed treatment of chemical equilibrium as related to precipitation, acid-base, complexation and redox titrations. Potentiometry and UV-visible absorption spectrophotometry.
Prerequisite: none. 3 hours lecture; 3 semester hours.

CHGN508. ANALYTICAL SPECTROSCOPY. 3.0 Semester Hrs.
(II) Detailed study of classical and modern spectroscopic methods; emphasis on instrumentation and application to analytical chemistry problems. Topics include: UV-visible spectroscopy, infrared spectroscopy, fluorescence and phosphorescence, Raman spectroscopy, arc and spark emission spectroscopy, flame methods, nephelometry and turbidimetry, reflectance methods, Fourier transform methods in spectroscopy, photoacoustic spectroscopy, rapid-scanning spectroscopy. Prerequisite: none. 3 hours lecture; 3 semester hours. Offered alternate years.

CHGN509. BIOLOGICAL INORGANIC CHEMISTRY. 3.0 Semester Hrs.
This course starts with a short introduction to inorganic chemistry and biology. The course then focuses on core bioinorganic chemistry topics, including metalloprotein structure and function; characterization of bioinorganic systems; metal assimilation, metabolism, and homeostasis; and metals in medicine. We also briefly cover special topics, such as metallo-endocrinology, extremophiles, biomineralization, and supramolecular bioinorganic chemistry. We investigate recent advances in the field of bioinorganic chemistry, introduce many leading scientists in the field, and explore scientific literature. Students are assessed through two open-resource, take-home exams (midterm and final) covering course material. Students also explore a topic of their choice through a class presentation and a writing assignment. There are no formal prerequisites for the class; however, students will benefit from having taken at least one of the following courses: organic chemistry, inorganic chemistry, or biochemistry.

CHGN510. CHEMICAL SEPARATIONS. 3.0 Semester Hrs.
(II) Survey of separation methods, thermodynamics of phase equilibria, thermodynamics of liquid-liquid partitioning, various types of chromatography, ion exchange, electrophoresis, zone refining, use of inclusion compounds for separation, application of separation technology for determining physical constants, e.g., stability constants of complexes. Prerequisite: CHGN507. 3 hours lecture; 3 semester hours. Offered alternate years.

CHGN511. APPLIED RADIOCHEMISTRY. 3.0 Semester Hrs.
(II) The Applied Radiochemistry course is designed for those who have a budding interest radiochemistry and its applications. A brief overview of radioactivity and general chemistry will be provided in the first three weeks of the course. Follow-on weeks will feature segments focusing on the radiochemistry in the nuclear fuel cycle, radioisotope production, nuclear forensics and the environment. 3 hours lecture and discussion; 3 semester hours. Prerequisite: CHGN 122 or CHGN 125.

CHGN512. COLLOID AND SURFACE CHEMISTRY. 3.0 Semester Hrs.
Introduction to colloid systems, capillarity, surface tension and contact angle, adsorption from solution, micelles and micro - emulsions, the solid/gas interface, surface analytical techniques, van der Waal forces, electrical properties and colloid stability, some specific colloid systems (clays, foams and emulsions) will be introduced.
Course Learning Outcomes

- Gain knowledge in fundamental chemical principles and processes occuring at interfaces.

CHGN513. CHEMISTRY OF THE LANTHANIDES AND ACTINIDES. 3.0 Semester Hrs.
This course is designed to introduce students to the chemistry and properties lanthanide and actinide elements, collectively known as the f-block. These elements are key components of nearly all electronic devices, and you are currently using about eight of them if you are reading this on a cellphone or computer. They also possess fascinating and complex chemistry that can be quite different from transition metals. The course will start with a history of their discovery and the developments that took place during the Manhattan Project. The course will then continue with fundamentals of f-block chemistry with a focus on electronic structure and thermodynamics. Following this, other core topics will include: 1) environmental chemistry including efforts to remediate Cold War legacy nuclear sites and how chemistry plays a role in this. 2) Aqueous Chemistry. 3) Coordination chemistry. 4) Optical and magnetic properties and the selection rules that determine these phenomena. 5) Catalysis, including small molecule activation and polymerization. 5) Separations and recycling. 6) Nuclear Medicine. Each year the course will be partially tailored to recent discoveries and adjusted in focus based on class interests.
Course Learning Outcomes

- At the completion of this course, students will: Have an understanding of why f-block elements are fundamentally different from elements in other parts of the periodic table.
- Understand why the unique electronic properties of f-block elements play key roles in numerous technologies.
- Understand the pros and cons of nuclear energy including the recycling and storage of nuclear waste.

CHGN515. CHEMICAL BONDING IN MATERIALS. 3.0 Semester Hrs.
(I) Introduction to chemical bonding theories and calculations and their applications to solids of interest to materials science. The relationship between a material's properties and the bonding of its atoms will be examined for a variety of materials. Includes an introduction to organic polymers. Computer programs will be used for calculating bonding parameters. Prerequisite: none. 3 hours lecture; 3 semester hours.

CHGN523. SOLID STATE CHEMISTRY. 3.0 Semester Hrs.
(I) Dependence of properties of solids on chemical bonding and structure; principles of crystal growth, crystal imperfections, reactions and diffusion in solids, and the theory of conductors and semiconductors. Prerequisite: none. 3 hours lecture; 3 semester hours. Offered alternate years.

CHGN529. BIOCHEMISTRY II. 3.0 Semester Hrs.
A continuation of CHGN428. Topics include: nucleotide synthesis; DNA repair, replication and recombination; transcription, translation and regulation; proteomics; lipid and amino acid synthesis; protein target and degradation; membranes; receptors and signal transduction. Prerequisite: CHGN 428.

CHGN535. PHYSICAL BIOCHEMISTRY. 3.0 Semester Hrs.
Apply physical chemical principles to understand property-function relationships of biochemical molecules, and investigate biochemical instrumentation and quantitative analyses common to biochemistry. Methods discussed include light/fluorescence microscopy, biomolecular structure determination, i.e., X-ray crystallography, cryo-electron microscopy and NMR, scattering techniques, biomolecular motors, and more. Prerequisite: CHGN 428 + CHGN 209 or equivalent (CBEN 210 or BIOL 301) Co-requisite: N/A.
Course Learning Outcomes

- 1) Demonstrate basic knowledge of thermodynamics and statistical mechanics, and their applications in biochemistry
- 2) Demonstrate basic knowledge of quantum mechanics and its applications in biochemistry
- 3) Demonstrate basic knowledge of common spectroscopic and imaging methods used in biochemistry
- 4) Develop grant-writing skills, particularly in relation to explaining scientific concepts clearly and concisely
- 5) Develop oral presentation skills when disseminating scientific information

CHGN536. ADVANCED POLYMER SYNTHESIS. 3.0 Semester Hrs.
(II) An advanced course in the synthesis of macromolecules. Various methods of polymerization will be discussed with an emphasis on the specifics concerning the syntheses of different classes of organic and inorganic polymers. 3 hours lecture, 3 semester hours Prerequisite: CHGN 430, CBEN 415, MLGN 530.

CHGN538. ORGANIC SEMICONDUCTORS: NEW TECHNOLOGIES FOR EMERGING APPLICATIONS. 3.0 Semester Hrs.
(II) Organic Light Emitting Diodes (OLEDs) is a display technology that can be found in many commercial products such as the smartphones and tablets. This technology was on the R&D bench-top just 10 years ago and has now reached high volume manufacturing. Other related technologies like organic photovoltaics (OPV) and organic thin film transistors (OTFT) are now on the heels of commercialization as well. This course will provide an overview on how this meteoric rise from bench-top to commercial products occurred as well as the design, synthesis and uses of conjugated organic small molecules, oligomers and polymers in applications such as OLEDs (for flat panel displays and lighting), OPV, OTFT, and sensors. Additional topics to be covered are factors governing the materials physical properties and structure-property relationship in electronic device applications. The prospect of using low cost printing techniques such as inkjet, screen, and gravure printing in the fabrication of roll-to-roll organic based devices will be discussed. Encapsulation, lifetime and reliability issues will also be presented. Prerequisites: Organic Chemistry 1 & 2 are encouraged. 3 hours lecture; 3 semester hours.
Course Learning Outcomes

- Ability to apply the knowledge on Organic Semiconductors and Structure-Property relationships to future research and engineering problems

CHGN540. PROFESSIONAL SKILLS FOR CHEMICAL SCIENTISTS. 1.0 Semester Hr.
The goal of this course is to provide students a set of skills that are complementary to their core education. The contents of this course cover a broad range of topics that will provide the participants a perspective on careers in science and the skill sets necessary to be successful in each. These skills are in line with the latest recommendations of the American Chemical Society (ACS) and CSM educational goals. In particular, the 2013 ACS Presidential Commission Report on Graduate Education in the Chemical Sciences presents a platform for educational reform that includes a focus on multi-level (from general public to specialists) and multi-platform communication (formal and informal, written, oral), an understanding of the global chemical enterprise and the career possibilities within each, an understanding of networking and collaboration, etc. 1 hour lecture; 1 semester hour.

CHGN545. CHEMICAL BIOLOGY. 3.0 Semester Hrs.
The analysis of biological systems from the perspective of organic/inorganic and physical chemistry, including chemical reactions for the synthetic preparation of biomolecules and the chemistry behind different biotechnological developments and tools. A strong emphasis on the mechanistic basis of biochemical transformations is included. Strategies for directing pharmaceuticals or diagnostics to different subcellular locales will be presented. A survey of key advancements in the field of chemical biology will be drawn from the primary literature. Prerequisite: CHGN 222, CHGN 428.

CHGN555. POLYMER AND COMPLEX FLUIDS COLLOQUIUM. 1.0 Semester Hr.
Equivalent with CBEN555,MLGN555,
The Polymer and Complex Fluids Group at the Colorado School of Mines combines expertise in the areas of flow and field based transport, intelligent design and synthesis as well as nanomaterials and nanotechnology. A wide range of research tools employed by the group includes characterization using rheology, scattering, microscopy, microfluidics and separations, synthesis of novel macromolecules as well as theory and simulation involving molecular dynamics and Monte Carlo approaches. The course will provide a mechanism for collaboration between faculty and students in this research area by providing presentations on topics including the expertise of the group and unpublished, ongoing campus research. Prerequisites: none. 1 hour lecture; 1 semester hour. Repeatable for credit to a maximum of 3 hours.

CHGN560. GRADUATE SEMINAR. 1.0 Semester Hr.
Required for all candidates for the M.S. and Ph.D. degrees in Chemistry. Full-time graduate students resident on campus must register for the course during each semester of their first four years of residency. Attendance at most departmental seminars is required, and all graduate students are required to present a departmental seminar. Prerequisite: Enrollment in Chemistry M.S. or Ph.D. degree program.

CHGN580. STRUCTURE OF MATERIALS. 3.0 Semester Hrs.
(II) Application of X-ray diffraction techniques for crystal and molecular structure determination of minerals, inorganic and organometallic compounds. Topics include the heavy atom method, data collection by moving film techniques and by diffractometers, Fourier methods, interpretation of Patterson maps, refinement methods, direct methods. Prerequisite: none. 3 hours lecture; 3 semester hours. Offered alternate years.

CHGN581. ELECTROCHEMISTRY. 3.0 Semester Hrs.
(I) Introduction to theory and practice of electrochemistry. Electrode potentials, reversible and irreversible cells, activity concept. Interionic attraction theory, proton transfer theory of acids and bases, mechanisms and fates of electrode reactions. Prerequisite: none. 3 hours lecture; 3 semester hours. Offered alternate years.

CHGN583. PRINCIPLES AND APPLICATIONS OF SURFACE ANALYSIS TECHNIQUES. 3.0 Semester Hrs.
(II) Instrumental techniques for the characterization of surfaces of solid materials; Applications of such techniques to polymers, corrosion, metallurgy, adhesion science, microelectronics. Methods of analysis discussed: x-ray photoelectron spectroscopy (XPS), auger electron spectroscopy (AES), ion scattering spectroscopy (ISS), secondary ion mass spectrometry (SIMS), Rutherford backscattering (RBS), scanning and transmission electron microscopy (SEM, TEM), energy and wavelength dispersive x-ray analysis; principles of these methods, quantification, instrumentation, sample preparation. 3 hours lecture; 3 semester hours. Prerequisite: B.S. in Metallurgy, Chemistry, Chemical Engineering, Physics, or consent of instructor.

CHGN584. FUNDAMENTALS OF CATALYSIS. 3.0 Semester Hrs.
(II) The basic principles involved in the preparation, characterization, testing and theory of heterogeneous and homo geneous catalysts are discussed. Topics include chemisorption, adsorption isotherms, diffusion, surface kinetics, promoters, poisons, catalyst theory and design, acid base catalysis and soluble transition metal complexes. Examples of important industrial applications are given. Prerequisite: CHGN222. 3 hours lecture; 3 semester hours.

CHGN585. CHEMICAL KINETICS. 3.0 Semester Hrs.
(II) Study of kinetic phenomena in chemical systems. Attention devoted to various theoretical approaches. Prerequisite: none. 3 hours lecture; 3 semester hours. Offered alternate years.

CHGN597. SPECIAL RESEARCH. 0-15 Semester Hr.

CHGN598. SPECIAL TOPICS IN CHEMISTRY. 0-6 Semester Hr.
(I, II, S) Pilot course or special topics course. Topics chosen from special interests of instructor(s) and student(s). Usually the course is offered only once, but no more than twice for the same course content. Prerequisite: none. Variable credit: 0 to 6 credit hours. Repeatable for credit under different titles.

CHGN598. SPECIAL TOPICS. 0-6 Semester Hr.

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CHGN599. INDEPENDENT STUDY. 0.5-6 Semester Hr.
(I, II, S) Individual research or special problem projects supervised by a faculty member, also, when a student and instructor agree on a subject matter, content, and credit hours. Prerequisite: “Independent Study” form must be completed and submitted to the Registrar. Variable credit: 0.5 to 6 credit hours. Repeatable for credit under different topics/experience and maximums vary by department. Contact the Department for credit limits toward the degree.

CHGN599. INDEPENDENT STUDY. 0.5-6 Semester Hr.

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CHGN625. MOLECULAR SIMULATION. 3.0 Semester Hrs.
Principles and practice of modern computer simulation techniques used to understand solids, liquids, and gases. Review of the statistical foundation of thermodynamics followed by indepth discussion of Monte

Carlo and Molecular Dynamics techniques. Discussion of intermolecular potentials, extended ensembles, and mathematical algorithms used in molecular simulations. 3 hours lecture; 3 semester hours. Prerequisite: CBEN 509 or equivalent, and recommend CBEN 610 or equivalent.

CHGN698. SPECIAL TOPICS IN CHEMISTRY. 0-6 Semester Hr.
(I, II, S) Pilot course or special topics course. Topics chosen from special interests of instructor(s) and student(s). Usually the course is offered only once, but no more than twice for the same course content. Prerequisite: none. Variable credit: 0 to 6 credit hours. Repeatable for credit under different titles.

CHGN699. INDEPENDENT STUDY. 0.5-6 Semester Hr.
(I, II, S) Individual research, special problem projects, or internship supervised by a Chemistry faculty member, with student and instructor agreeing on a subject matter, content, deliverables, and credit hours. Variable credit: 0.5 to 6 credit hours. Repeatable for credit under different topics/experience and maximums vary by department. Contact the Department for credit limits toward the degree. Prerequisites: “Independent Study” form must be completed and submitted to the Registrar.

CHGN699. INDEPENDENT STUDY. 0.5-6 Semester Hr.
(I, II, S) Individual research, special problem projects, or internship supervised by a Chemistry faculty member, with student and instructor agreeing on a subject matter, content, deliverables, and credit hours. Variable credit: 0.5 to 6 credit hours. Repeatable for credit under different topics/experience and maximums vary by department. Contact the Department for credit limits toward the degree.

CHGN707. GRADUATE THESIS / DISSERTATION RESEARCH CREDIT. 1-15 Semester Hr.
(I, II, S) Research credit hours required for completion of a Masters-level thesis or Doctoral dissertation. Research must be carried out under the direct supervision of the student's faculty advisor. Variable class and semester hours. Repeatable for credit.

Professors

Thomas Albrecht

Thomas Gennett, Department Head

Richard C. Holz, Provost

Mark P. Jensen, Grandey University Chair in Nuclear Science & Engineering

Daniel M. Knauss, Associate Dean of Energy and Materials

Matthew C. Posewitz

James F. Ranville

Ryan M. Richards

Alan S. Sellinger

Jenifer C. Shafer

Bettina M. Voelker

Shubham Vyas

Associate Professors

Dylan Domaille

Svitlana Pylypenko

Brian G. Trewyn

Assistant Professors

David Halat

Samantha Johnson

Annalise Maughan

C. Michael McGuirk

Teaching Professors

Renee L. Falconer, Assistant Department Head

Angela Sower

Teaching Associate Professors

Amanda Jameer

Erik Menke

Teaching Assistant Professors

Christian Beren

Amanda Furness

Jonathan Miorelli

Megan Moyer

Research Professors

Mark E. Eberhart

Kim R. Williams

Research Associate Professors

Nicholas Bedford

Jessica Jackson

Yuan Yang

Research Assistant Professors

Shane Galley

Joseph Sperling

Adjunct Faculty

Laurel Almer

Joint Appointees

Mark Allendorf

Matthew Beard

Todd Deutsch

Lieve Laurens

Bryan Pivovar

Daniel Ruddy

Rebecca Smaha

Affiliated Faculty

Judah Friese

Joseph Meyer

Nicholas Strange

John Stringer

Liz Ware

Professor Emeriti

Scott W. Cowley

Mark E. Eberhart

Ronald W. Klusman

Donald Langmuir

Donald L. Macalady

Patrick MacCarthy

Michael J. Pavelich

Mark R. Seger

E. Craig Simmons

Kent J. Voorhees

Thomas R. Wildeman

Kim Williams

David Wu