

# Chemistry

## Department of Chemistry

Chemistry has solved many of the world's greatest challenges including genetic codes, creating materials that will take humans to Mars, and discovering what is needed for an artificial human heart. Chemistry is the study of elements, the compounds they form, and the reactions they undergo.

Chemists tackle a broad range of challenges from environmental cleanup and pollution prevention to creating the materials that fuel the space program. Chemistry has been called the central science because it occupies a pivotal place in many disciplines.

The combination of a natural love for science with an exciting research project makes a degree in Chemistry at Missouri S&T both enjoyable and productive. Students can elect a special emphasis area such as Secondary Education, Biochemistry, Polymer and Coatings, or Pre-med.

### Student Organizations and Undergraduate Research

Chemistry students have the opportunity to participate in the South Central Missouri American Chemical Society (ACS), Alpha Chi Sigma, a professional chemistry fraternity, and the W.T. Schrenk Society, an affiliate organization of the ACS. Students can also participate in undergraduate research through the Office of Undergraduate Research Experience.

### Scholarship Information

Freshman scholarships are awarded based on high school transcripts and ACT/SAT score. The departmental scholarship committee offers scholarships based on GPA, class rank, commitment to a career in chemistry, and SAT/ACT scores. There are also scholarships available depending upon the student's emphasis area. A separate departmental application form is required.

### Departmental Contact Information

142 Schrenk Hall      573.341.4420  
chem.mst.edu      chem@mst.edu  
Interim Chairman:      Dr. Klaus Woelk

### Degree Options and Minors

Bachelor of Arts, Chemistry  
Bachelor of Arts, Chemistry, Secondary Education  
Bachelor of Science, Chemistry, ACS Certified with the following emphasis areas:

- B.S. Chemistry- Biochemistry
- B.S. Chemistry- Polymer and Coatings
- B.S. Chemistry- Pre-medicine

Minor, Chemistry

### Entry-Level Job Titles

|                  |                         |
|------------------|-------------------------|
| Teacher          | Consulting              |
| Research Chemist | Food and Drug Inspector |
| Chemical Sales   | Administration          |
| Writing/Editing  | Quality Control         |

### Employment and Graduate Studies

There has been a 100% success rate for placing students into jobs, graduate school, or medical school. Graduates have enjoyed successful careers in medicine, education, science laboratories, as well as sales and marketing. Upon completion of graduate school, chemistry majors have gone on to be doctors, dentists, biomedical scientists, and environmental chemists.

### Co-op and Internship Availability

Co-op and intern programs are available to students. These programs provide students with the opportunity to integrate their classroom studies with productive work learning experiences in a field related to the student's academic or career goals.

Chemistry Students have worked with the following companies through the co-op program:

- American Cyanamid Company
- Ashland Petroleum
- Baxter Healthcare
- Protein Technologies
- Monsanto Co.
- Sigma Chemical Co.
- MEMC Electronic Materials, Inc.

## Faculty

### Professors:

Harvest Collier (Vice Provost for Undergraduate Studies), Ph.D., Mississippi State  
Nuran Ercal (Endowed Chair in Biochemistry), Ph.D., Hacettepe University, MD, Istanbul Medical School  
Shubhender Kapila (Endowed Professor), Ph.D., Dalhousie University  
Nicholas Leventis (Curators' Professor), Ph.D., Michigan State  
Gary J. Long, Ph.D., Syracuse  
Yinfa Ma (Curators' Teaching Professor), Ph.D., Iowa State  
Chariklia Sotiriou-Leventis, Ph.D., Michigan State  
Jay Switzer (Endowed Professor of Discovery in Chemistry), Ph.D., Wayne State  
Philip D. Whitefield (Interim Vice Provost for Academic Affairs), Ph.D., University of London-Queen Mary College

### Associate Professors:

Paul Nam, Ph.D., University of Missouri-Columbia  
V. Prakash Reddy, Ph.D., Case Western Reserve University  
Thomas P. Schuman, Ph.D., University of Alabama-Huntsville  
Pericles Stavropoulos, Ph.D., Imperial College of Science, Technology & Medicine  
Michael R. Van De Mark, Ph.D., Texas A&M  
Jeffrey G. Winiarz, Ph.D., State University of New York at Buffalo  
Klaus Woelk (Interim Chairman), Ph.D., University of Bonn

### Assistant Professors:

Amitava Choudhury, Ph.D., Indian Institute of Science  
Richard Dawes, Ph.D., University of Manitoba  
Manashi Nath, Ph.D., Indian Institute of Science

### Assistant Teaching Professors:

EmmaLou Satterfield, M.S., Missouri University of Science and Technology

### Lecturers:

Cynthia Bolon, Ph.D., University of Missouri-Rolla (now Missouri S&T)  
Terry Lynn Bone, Ph.D., University of Missouri-Rolla (now Missouri S&T)

## Bachelor of Arts, Chemistry 120 Credit Hours

English 1120: Exposition & Argumentation  
English 1160: Writing and Research  
History 1100: Early Western Civilization  
History 1200: Modern Western Civilization  
Math 1208: Calculus w/ Analytic Geometry I  
Math 1221: Calculus w/ Analytic Geometry II  
Foreign Language  
Statistics 3113: Applied Engineering Statistics  
Physics 1111: General Physics I  
Physics 1119: General Physics Lab I  
Physics 2111: General Physics II  
Physics 2119: General Physics Lab II  
Chem 1310: General Chemistry  
Chem 1319: General Chemistry Lab  
Chem 1320: General Chemistry  
Chem 1100: Intro to Lab Safety and Hazardous Materials  
Chem 1510: Qualitative Analysis  
Chem 2210: Organic Chemistry I  
Chem 2219: Organic Chemistry I Lab  
Chem 2220: Organic Chemistry II  
Chem 2229: Organic Chemistry II Lab  
Chem 2510: Analytical Chemistry I  
Chem 3410 or 3430: Physical Chemistry or Chem 3420: Intro to Quantum Chemistry  
Chem 3419 or 3439: Physical Chemistry Lab  
Chem 4010: Undergraduate Seminar  
Chemistry Elective  
Humanities Electives  
Humanities Elective Literature  
Social Science Electives  
Free Electives  
Minor in one of the following: English, Economics, History, Philosophy, Psychology, Sociology, Communications, Speech, Media, Political Science, Music, Math, Statistics, Foreign Language, Computer Science, Biology, or Art

\*Students wishing to earn a B.A. with an additional emphasis in Secondary Education must complete 135 credit hours. The additional courses are in Education, Psychology, History, Speech, and Content Areas. Students must complete paperwork in the department office to choose this emphasis area and will receive an advisor to assist with course selection.

## Bachelor of Science, Chemistry 131 credit hours

English 1120: Exposition and Argumentation  
English 1160: Writing and Research  
History 1200, 1300, 1310, or Political Science 1200  
Math 1208: Calculus w/ Analytic Geometry I  
Math 1221: Calculus w/ Analytic Geometry II  
Math 2222: Calculus w/ Analytic Geometry III  
Statistics 3113: Applied Engineering Statistics  
Comp Sci 1570 or 1971 & 1981: Intro to Programming  
Physics 1111: General Physics I  
Physics 1119: General Physics Lab  
Physics 2111: General Physics II  
Physics 2119: General Physics Lab  
Chem 1310: General Chemistry  
Chem 1319: General Chemistry Lab  
Chem 1320: General Chemistry  
Chem 1100: Intro to Lab Safety and Hazardous Materials  
Chem 1510: Qualitative Analysis  
Chem 1110: Intro to Chemistry  
Chem 2210: Organic Chemistry I  
Chem 2219: Organic Chemistry I Lab  
Chem 2220: Organic Chemistry II  
Chem 2229: Organic Chemistry II Lab  
Chem 2310: Inorganic Chemistry  
Chem 2319: Inorganic Chemistry Lab  
Chem 2510: Analytical Chemistry I  
Chem 3410: Physical Chemistry  
Chem 3419: Physical Chemistry Lab  
Chem 3430: Physical Chemistry  
Chem 3439: Physical Chemistry Lab  
Chem 3510: Analytical Chemistry II  
Chem 4297: Organic Synthesis & Spec. Analysis  
Chem 3420: Intro to Quantum Chemistry  
Chem 4610: Biochemistry  
Chem 4010 or 4099: Undergraduate Seminar or Research  
Chem Electives  
Social Science Electives  
Technical Electives  
Humanities Electives  
Humanities Elective Literature  
Free Electives

\*Students wishing to complete an additional emphasis area in biochemistry, polymer and coatings or pre-med must complete paperwork in the department office. The biochemistry and polymer and coatings emphasis areas consist of 131 credit hours and the pre-med consists of 133 credit hours. Students will be assigned an advisor to assist with course selection.

## Minor, Chemistry 19 credit hours

Chem 1310: General Chemistry  
Chem 1319: General Chemistry Lab  
Chem 1320: General Chemistry  
Chem 1100: Intro to Lab Safety & Hazardous Materials  
Chem 1510: Qualitative Analysis  
Chem 2210: Organic Chemistry  
Either Chem 2289 or 2219: Organic Chemistry Lab

Three additional hours of chemistry are to be selected from Chem 2510: Analytical Chemistry, or other upper level Chem courses.

## Notes

**Detailed information on course equivalencies, acceptable credits for elective coursework, grade requirements, and prerequisites is available from Missouri S&T's Registrar's Office at [registrar.mst.edu](http://registrar.mst.edu).**