



# What can I do with a Major in...

## Chemistry

### What is Chemistry?

Chemistry is the science concerned with the composition, structure, and properties of matter, as well as the changes it undergoes during chemical reactions. Chemistry is a physical science related to studies of various atoms, molecules, crystals and other aggregates of matter whether in isolation or combination, which incorporates the concepts of energy and entropy in relation to the spontaneity of chemical processes.

Disciplines within chemistry are traditionally grouped by the type of matter being studied or the kind of study. These include inorganic chemistry, the study of inorganic matter; organic chemistry, the study of organic matter; biochemistry, the study of substances found in biological organisms; physical chemistry, the energy related studies of chemical systems at macro, molecular and submolecular scales; analytical chemistry, the analysis of material samples to gain an understanding of their chemical composition and structure. Many more specialized disciplines have emerged in recent years, e.g. neurochemistry the chemical study of the mind.

### Chemistry at U of L

Chemistry at Louisville continues to build on its strong traditions. The members of our faculty are accomplished teacher-scholars who maintain exciting research programs in the myriad arenas that comprise the modern chemical sciences. Our undergraduate curriculum has been revised to reflect more "real-world" approaches to the science of chemistry. Our graduate program offers research opportunities in organic and inorganic synthesis, in theoretical and computational chemistry, in analytical chemistry including the development of micro- and nanoscale sensors, chemical catalysis, natural products research drug discovery and delivery, metabolomics, chemical biology and chemical physics.

### Degrees in Chemistry at U of L:

#### Bachelor of Arts

The Bachelor of Arts Degree in Chemistry is designed for students who want a broader, more general education than is possible in the Bachelor of Science Degree program, while at the same time receiving a substantial background in chemistry. This degree program is compatible with preprofessional education in such fields as education, medicine, dentistry or lab technician. Electives should be selected to suit the student's specific career goals

#### Bachelor of Arts - Premedical Track

This Bachelor of Arts Degree in Chemistry is designed to meet the core academic needs of premedical students. Less rigorous than the Bachelor of Science Degrees in Chemistry, it still includes the requirements specified by the University of Louisville's School of Medicine admissions.



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### Bachelor of Science

The Bachelor of Science Degree in Chemistry is designed to prepare professional chemists for industrial and government positions and to provide a solid foundation for those wishing to pursue an advanced degree in chemistry. The curriculum meets the approved requirements for professional training set forth by the American Chemical Society and is fully accredited by the ACS. There is a strong emphasis on training in the major disciplines of chemistry, affording the student both lecture and laboratory experience in analytical, organic, inorganic, physical and biochemistry. Additionally, B.S. majors will spend at least one semester working on an undergraduate research project with a faculty member of their choice.

### Bachelor of Science - Biochemistry Concentration

The Bachelor of Science Degree with Biochemistry Concentration offers the advantage of combining the traditional program in chemistry with a strong concentration in biological and biochemical aspects. This Degree is designed particularly for students interested in pursuing research or technical careers in bioscience or biotechnology.

### Bachelor of Science - Business Concentration

The Bachelor of Science Degree with a concentration in Business combines a general program in Chemistry with a fundamental program in Business. The curriculum is designed to prepare chemists for industrial and government positions, emphasizing managerial or administrative skills.

### **Occupational Overview**

Conduct qualitative and quantitative chemical analyses or chemical experiments in laboratories for quality or process control or to develop new products or knowledge.

### **Employment Requirements**

A bachelor's degree is the minimum formal education required. However, many employers also require graduate school. For example, they may require a master's degree, and some require a Ph.D., M.D., or J.D. (law degree).



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### Career Opportunities in Chemistry:

Agricultural Scientist	Cytotechnologist	Occupational Safety Spec.
Assayer	Environ. Health Specialist	Performer
Biochemist	Fire Protection Engineer	Pharmaceutical Sales Rep
Brewer Lab Assistant	Food Scientist Technician	Physician
Cephalometric Analyst	Forensic Chemist	Planner
Chemical Oceanographer	Genetic Counselor	Plastics Engineer
Chemistry Technologist	High School Teacher	Product Tester
Clarifying Plant Operator	Hospital Administrator	Quality Assurance Mgr
College Professor	Hydrologist	Risk Manager
Color Development Chem	Industrial Hygienist	Science Lab Technician
Crime Lab Analyst	Molecular Biologist	Soil Scientist
System Analyst	Tissue Technologist	Toxicologist
Underwater Technician	Vector Control Assistant	Veterinarian
Wastewater Treatment Chem	Water Purification Chemist	Yeast Culture Developer
Anesthesiologist	Chemistry Professor	Clinical Specialist
Computer Software Eng.	Coop Extension Agent	Dentist
Entomologist	Environmental Engineer	EPA Inspector
FDA Inspector	General Surgery Resident	Hydrogeologist
Industrial/Institutional Buyer	Lawyer	Medical Technologist
Metallurgist	Museum Curator	Nurse
Occupational Health Spec.	Optometrist	Patent Agent
Pharmacist	Product Development Mgr	Psychiatrist
Radiologist	Scientific Photographer	Senior Report Writer
Specification Writer	Water Scientist	

### Employers/Industries and Success Strategies:

**Analytical:** Colleges and universities - Environmental protection organizations - Federal agencies including National Aeronautics and Space Administration - Federal, state, and local government - Industrial production and inspection agencies - Manufacturing firms including textile, petroleum, food, electronics, glass, paper, packaging, machinery, cosmetics, paint, drug, and chemical industries - Research laboratories and organizations

**Suggested Strategy:** Familiarize yourself with federal, state, and local government job application processes. Gain experience in a laboratory setting. Develop proficiency with high-tech scientific equipment. Take electives in your area of interest.



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**Organic:** Colleges and universities - Federal/state government - Industries related to petroleum, wood products, plastics, textiles, and food - Manufacturing firms developing new synthetic materials and new production processes - Research organizations

**Suggested Strategy:** Gain additional laboratory and research experience through internships and summer jobs. Get involved with undergraduate research with professors.

**Biochemical:** Biotechnology firms - Colleges and universities - Environmental protection organizations - Federal, state and local government, such as the Centers for Disease Control - Food processors - Industrial production and inspection agencies - Pharmaceutical and medical research firms - Plant and animal breeders and growers - Research laboratories and organizations

**Suggested Strategy:** Take additional courses in biology, biochemistry, molecular biology, genetics, cytology, and physiology. Develop excellent laboratory and computer skills. Get involved with undergraduate research with professors. Join related professional organizations. Complete a related internship with an organization in the area of your interest.

**Other Areas:** Agricultural product companies - Drug stores - Environmental management organizations - Industries including textiles, petroleum, food, electronics, glass, paper, packaging, machinery, cosmetics, paint, drugs, and chemicals - Manufacturing firms - Medical/Pharmaceutical supply companies - Waste management firms

**Suggested Strategy:** Obtain a minor in business and develop strong verbal and written communication, interpersonal, and organizational skills. Hold leadership positions in campus organizations. Join related student organizations, e.g., American Marketing Association, Financial Management Association, Public Relations Student Society of America, etc.

### Related Links in the Chemistry Discipline:

#### Professional Association Links

[RSC's Chemical Science Network](#)

[American Academy of Forensic Sciences](#)

[American Society of Crime Laboratory Directors](#)

[Chemical & Engineering New Online](#)

[Chem Web: searchable database and publications for students](#)

[Forensic Chemistry Network American Chemical Society](#)

[American Institute of Chemical Engineers American Institute of Chemists](#)

#### Career Planning Links

[Royal Society of Chemistry: advice on choosing a career and job options for chemists](#)

[What Is a Clinical Chemist?](#)

[Chemist \(Occupational Outlook Handbook\)](#)

[Resources](#)

[Journal of Young Investigators Science Career Center](#)

[Royal Society of Chemistry](#)

[Organic Chemistry Jobs Worldwide](#)

[American Association for Clinical Chemistry](#)

[Chemist Jobs](#)



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[iHireChemists.com](http://iHireChemists.com)

### Salary/Outlook Info



<http://online.onetcenter.org>



<http://www.bls.gov/oco/>