

## Career-Related Services

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# Chemistry & Biochemistry



Center for STRATEGIC ADVISING  
& CAREER COUNSELING

# Career Options for Chemistry & Biochemistry Majors

This booklet contains specific information about majoring in chemistry and biochemistry at The University of Texas at Austin, as well as career opportunities related to this major. The careers listed typically require a bachelor's degree, and special certification or training requirements are noted. Please use this booklet as an idea generator, rather than as a comprehensive list of all career options for chemistry and biochemistry majors. The career descriptions were obtained from the Sanger Learning & Career Center (SLCC) library and career websites (see listing of sources on last page).

The first section, "Direct Career Opportunities," includes careers that use the analytical and quantitative skills acquired by chemistry and biochemistry majors. The second section, "More Career Opportunities," lists careers that are potentially available to all natural sciences majors who have related experience or coursework.

For chemistry and biochemistry majors, there are many career options that require a master's or doctoral degree but do not require any particular undergraduate degree. Examples of these include law, international affairs, museum administration, library and information studies, hospital administration, and many more. For careers requiring graduate education, please visit our library or speak to a career counselor.

The SLCC offers many other services and resources to help you with your career planning. These include:

- Career Counseling
- Career Assessment
- Career Information Library
- Internship Information
- Graduate School Planning Assistance

Visit our website at [utexas.edu/ugs/csacc](http://utexas.edu/ugs/csacc) or call 232-8400 for more information.

# **MAJORING IN CHEMISTRY & BIOCHEMISTRY AT THE UNIVERSITY OF TEXAS AT AUSTIN**

Departmental Website: [www.cm.utexas.edu](http://www.cm.utexas.edu)

Campus Location: WEL 2.310

Phone Number: 471-3949

## **DESCRIPTION OF MAJOR**

Chemistry is a major branch of the physical sciences and involves the study of substances and energy. It focuses on their composition, characteristics, changes, reactions, uses, and benefits and dangers to humanity.

## **AREAS OF STUDY**

Chemistry

Biochemistry

Computation

Teaching

## **EXAMPLES OF COURSES**

### **CH 431 Inorganic Chemistry**

Survey of the chemistry of the elements, incorporating both descriptive and theoretical aspects. Open-ended experiments designed to illustrate a variety of synthetic techniques.

### **CH 354L Physical Chemistry II**

Molecular energy levels, statistical thermodynamics (macroscopic thermodynamic functions from molecular input), and physical and chemical kinetics, with emphasis on the molecular viewpoint.

### **CH 339K Biochemistry I**

Structure and function of amino acids, proteins, carbohydrates, lipids, and nucleic acids.

## **CH 354 Quantum Chemistry and Spectroscopy**

Fundamental principles of quantum mechanics, exactly soluble model problems, electronic structure of atoms and molecules, spectroscopy.

### **Skills gained by Chemistry and Biochemistry Majors**

Strong mathematical skills

Ability to organize, analyze, and interpret scientific data

Proficiency with computers and scientific instruments

Understand and express complex technical information

Conduct scientific research

Aptitude for accuracy and details

## **DIRECT JOB OPPORTUNITIES**

This sampling includes careers that use the analytical and quantitative skills typically acquired by chemistry and biochemistry majors.

### **Analytical Chemist**

Make measurements using sophisticated state-of-the-art computer-controlled instrumentation in government laboratories as well as in laboratories in the chemical, pharmaceutical, biotechnology, and food industries. May also be involved in developing new measurement techniques. Often work as quality assurance specialists to ensure that procedures and protocols are followed.

### **Chemical Information Specialist**

Organize technical chemistry information from scientific journals, papers, databases, and patents and make it easily accessible to researchers and industry professionals. Support researchers by providing background information necessary for experiments. Work for libraries, chemical companies, market research firms, and management consulting firms. Library positions require a master's degree in library science.

### **Chemical Sales Manager**

Meet with customers and suppliers and work with in-house scientists. Link the technical staff at a company with its markets by helping chemists design products that fit customers' requirements. Track the long-term needs of a market and focus research on these needs.

### **Chemical Sales Representative**

Assume responsibility for a product line at a chemical company and focus on sales in a particular territory. Travel in territory to meet with potential customers and attend sales conventions and trade shows. Communicate technical specifications of products to customers.

### **Chemical Technician**

Work in every aspect of chemical process industry, from basic research to hazardous waste management. Operate equipment and instrumentation, set up apparatus for chemical reactions, prepare compounds, monitor commercial production, test for product quality, and collect and analyze samples produced through organic synthesis. Conduct a variety of laboratory procedures from routine process control to complex research projects. Also work in data management, quality control, and shipping to provide technical support and expertise for these functions.

### **Consumer Product Chemist**

Invent, develop, and test chemical manufacturing processes and products. Transform raw materials or chemicals into useful products such as plastics, personal care products, and cosmetics. Work closely with engineers and technicians to create and test products. Develop tests that model end use of product and use the tests to relate chemical structure and formulation composition to product performance.

### **Environmental Chemist**

Study effects of water, air, and soil pollution, create new materials that reduce dependence on virgin sources, and develop production processes for such products. Collect and analyze samples from contaminated sites. Work with environmental

regulators to develop remediation plans to ensure industry compliance with environmental laws. Work for government agencies and consulting firms.

### **Food and Flavor Chemist**

Examine properties of proteins, fats, starches, and carbohydrates, as well as microcomponents such as additives and flavorants, to determine how each works in a food system. Invent different ways to use ingredients or create new ingredients, such as fat or sugar replacements. Use natural or artificial ingredients, sometimes in combination, to develop flavors for food products. Graduate degree in food science is helpful for advanced-level positions.

### **Forensic Science Technician**

Investigate crimes by collecting and analyzing physical evidence. Examine, test, and analyze tissue samples, chemical substances, physical materials, and ballistics evidence. Prepare reports or presentations of findings, investigative methods, or laboratory techniques. Testify as expert witness on evidence or laboratory techniques.

### **Geochemist**

Study occurrence and distribution of chemical elements in rocks and minerals as well as the movement of these elements into soil and water systems. Conduct fieldwork, gather data, analyze samples, and travel extensively. Contribute to natural resource use and environmental management policies. Work for government agencies such as the Department of Energy and Bureau of Mines, oceanographic institutes, and mining companies.

### **Hazardous Waste Management Chemist**

Use analytical chemistry skills to determine the composition of materials deemed hazardous, working either in a lab or in the field. Work with biologists, toxicologists, and water and soil chemists to evaluate hazardous wastes and develop strategies for disposal or cleanup.

### **Textile Research Scientist**

Study technical aspects of fibers and fabrics to improve existing fibers, yarns, and fabrics and to create better ones. Work for fiber manufacturers, textile mills, and testing and development laboratories.

### **Water Resources Manager**

Manage water treatment plants that make water safe to drink or return purified wastewater back into rivers and oceans. Plan, design, and operate water treatment systems, monitor community water use, negotiate with neighboring communities for water rights, and meet with public interest groups to present water resource proposals. Work for state or local governments or private water supply companies.

## **MORE JOB OPPORTUNITIES**

This section lists other opportunities that may be available to all natural sciences majors. Entry into these careers usually requires internship or volunteer experience or relevant coursework in addition to a chemistry and biochemistry degree. This is a sampling of job opportunities; for more options and ideas, please visit the SLCC career information library.

### **ADVERTISING/MARKETING/SALES**

#### **Buyer**

Purchase merchandise directly from manufacturers and resell it to retailers (wholesale buyer) or purchase goods from wholesalers for resale (retail buyer). Become expert in particular kind of merchandise (such as scientific equipment or pharmaceuticals), stay informed about new trends, analyze customers' buying preferences, and decide what merchandise employer will sell.

#### **Customer Service Representative**

Interact with customers to provide information in response to inquiries about scientific and technical products and services and to handle and resolve complaints.

### **Green Marketing Analyst**

Create innovative ways to introduce environmentally conscious products into the marketplace. Analyze sales data and consumer spending habits and consult with other marketing team members and graphic designers.

### **Pharmaceutical Sales Representative**

Market a pharmaceutical company's products to physicians, hospitals, and pharmacists. Conduct sales meetings, give presentations, and maintain current knowledge about employer's products. Sales experience is helpful.

### **Scientific Sales/Service Manager**

Direct the actual distribution or movement of a scientific or technical product or service to the customer. Coordinate sales distribution by establishing sales territories, quotas, and goals and establish training programs for sales representatives. Analyze sales statistics gathered by staff to determine sales potential and inventory requirements and monitor the preferences of customers.

## **BUSINESS**

### **Health Information Administrator**

Plan, develop, and supervise systems for the management of health records that are consistent with current medical, ethical, and legal requirements. Supervise medical records personnel, analyze patient and institutional data, develop in-service training programs, act as liaison to medical staff, safeguard confidentiality of health records, and testify in court as needed. Work for hospitals, clinics, rehabilitation centers, insurance companies, and nursing homes.

### **Management Consultant Analyst**

Analyze business problems by collecting information from both internal and external sources, developing possible solutions, and then making recommendations to management team. Usually work for consulting firms, who hire recent college graduates for 2-3 year analyst positions.

### **Project Manager**

Plan, administer, and coordinate projects that relate to product development, product improvement, research for new ventures, new product sales launches, or organizational structure. Develop product schedules, allocate resources, interface with vendors, and hire, train, and supervise employees. Work for companies that provide scientific or technical products and services.

### **Quality Control Analyst**

Inspect, test, and audit materials, manufacturing processes, and products for compliance with company and industry quality standards. Develop quality assurance programs and prepare documentation reports. Work for companies that provide scientific or technical products and services.

### **Regulatory Affairs Specialist**

Ensure that companies comply with government and industry laws and regulations concerning the development, manufacturing, and marketing of health care products such as pharmaceuticals, medical devices, biotechnology products, and nutritional supplements. Help company seek FDA approval for clinical studies and act as regulatory resource. Advise scientists and project managers and review technical documents.

## **CORPORATE COMMUNICATION**

### **Public Relations Specialist**

Write articles for internal publications, write press releases, assemble press kits, arrange speaking engagements, assist in fundraising activities. Work in a variety of settings: business (especially in scientific, pharmaceutical, or biotech companies), government, non-profit, and education.

### **Technical Recruiter**

Maintain contacts in the community and travel, often to college campuses, to seek qualified job applicants. Screen and interview applicants and make job offers. Stay up-to-date on organizational hiring policies, equal employment opportunity, and affirmative action guidelines. Work for scientific and technical companies, government agencies, and non-profit organizations.

**Technical Writer**

Write technical materials, such as equipment manuals, appendices, or operating and maintenance instructions. May assist in layout work.

**Web Designer**

Use knowledge of computer applications to translate client needs into artistically appealing website. Select color, text, and artwork and update/maintain site as needed. May use science knowledge to contribute to content of websites for scientific and technical companies.

**EDUCATION****College Academic Advisor (Natural Sciences)**

Advise natural sciences students at all levels about selection of courses, schedule planning, and other academic issues. May present seminars and workshops and develop and implement academic programs and refer students to other campus resources.

**Corporate Trainer**

Develop and conduct individual, group, and classroom training for employees on a wide variety of subjects. Develop training manuals, handouts, procedures, and supplemental training materials. Other duties involve test creation and administration for the advancement of employees.

**Environmental Educator**

Make students aware of environmental issues such as recycling, pollution, and conservation through classroom learning, hands-on activities, nature walks, and online presentations. Work for nature centers, aquariums, camps, zoos, botanical gardens, and parks. Developing an area of expertise such as wildlife or geology is helpful.

**Secondary School Teacher**

Instruct high school and junior high school students in scientific subject areas. Most secondary school teachers teach several courses in a single subject area. Public schools generally require certification; private schools typically do not.

### **Science Educator**

Develop and implement science education programs. Create tours, demos, classes, workshops, films, field trips, and printed materials. Deliver educational outreach programs to schools and community centers. Provide instructional and curriculum support for teachers. Work for museums, science centers, planetariums, and programs sponsored by government agencies such as NASA and the National Science Foundation.

## **ENVIRONMENT AND OUTDOOR**

### **Alternative Energy Specialist**

Design and install systems that use renewable energy sources, such as glass and thermal solar panels and wind turbines. May act as liaison with utility companies. Entry-level technician jobs are available and some companies such as General Electric offer training programs for students.

### **Environmental Consultant**

Offer recommendations to local, state, and federal government agencies and private businesses who need to adopt environmentally sound practices, adhere to environmental regulations, or clean up contaminated sites. Develop strategies for clients to improve air quality or design recycling programs. Research ecological impacts of development and recommend solutions to mitigate these impacts, especially for endangered or threatened species. Work for environmental consulting firms.

### **Environmental Science and Protection Technician**

Perform laboratory and field tests to monitor the environment and investigate sources of pollution, including those that affect health. May collect samples of gases, soil, water, and other materials for testing and take corrective actions as assigned.

### **Forest and Conservation Technician**

Gather information on condition of forest land tracts such as species and population of trees, insect damage, and potential fire hazards. Supervise and train forest workers in maintaining forests and their recreational facilities. Work for government agencies or large corporations in the lumber and paper industries.

**Forester**

Manage forest land for conservation, recreational, and economic purposes. Inventory timber and negotiate contracts for tree procurement and removal. Create strategies for conserving wildlife, soil, and water quality and monitor overall health of forest. Requires concentration of courses in biology.

**Recycling Coordinator**

Design and implement curbside and drop-off recycling and hazardous waste programs through city governments or private firms. Conduct public outreach campaigns to educate people about the advantages of recycling. May ensure compliance with ordinances or apply for grants.

**GOVERNMENT****Environmental, Health and Safety Manager**

Develop programs and processes for companies to ensure compliance with federal, state, and local laws. Requires thorough knowledge of environmental regulations such as the Clean Air and Clean Water Acts. Act as liaison with environmental regulators from government agencies.

**Environmental Regulator**

Enforce environmental laws to protect the health of people, plants, animals, and the environment. Grant permits to industrial and municipal facilities and measure pollution and emission levels. Alert media and the public to problems such as toxic spills and poor water quality. Collect samples and analyze data. Work for federal, state, and local government agencies.

**Legal Assistant**

Assist lawyers by researching legal precedent, investigating facts, or preparing legal documents. Conduct research to support a legal proceeding, to formulate a defense, or to initiate legal action. Often requires specialized coursework.

### **Patent Agent**

Help businesses secure patents for new inventions such as pharmaceuticals, computer hardware, chemical processes, biotech products, and plant varieties. Work closely with inventors to prepare patent application. If registered by the U.S. Patent and Trademark Office (requires a bachelor's degree in science or engineering and passing score on examination), can represent companies in the patent application and discuss the application with patent examiners. Work for patent firms, law firms, corporate law departments, or on a freelance basis.

### **Patent Examiner**

Review patent applications to assess compliance with regulations, determine scope of protection claimed by inventors, research relevant technologies to compare proposed patent with prior inventions, and communicate findings to patent agent or inventor. Work for U.S. Patent and Trademark Office.

## **HUMAN SERVICES**

### **Americorps Volunteer**

Serve full-time for a year in organizations and agencies throughout the country, work to fight illiteracy, improve health services, create businesses, increase housing opportunities, or bridge the digital divide. Benefits include an Education Award or an end-of-service stipend.

### **Child Life Specialist**

Alleviate the stress of hospitalization for children and their families through play therapy and other kinds of counseling. Act as advocate and information source for children and collaborate with medical team.

### **Community Organizer**

Establish and organize community groups to solve social problems in the community. Assess strengths and weaknesses of existing resources and propose changes. Promote cooperation and coordination among government agencies, nonprofit organizations, and other community groups. Conduct research, prepare budgets, and assist in fundraising.

**Patient Advocate**

Work to represent the interests of patients/consumers in healthcare settings. Explain medical procedures, services, and policies, help troubleshoot patients' concerns and problems, act as advocate for patient with health care staff. Provide resources, information, and referrals to patients and their families. Conduct training programs for medical employees.

**Volunteer Coordinator**

Recruit, train, schedule and provide supervision to volunteers at non-profit organizations. Arrange for on-the-job and other required training, supervision and evaluation of volunteers. Serve as liaison between administration, staff, and volunteers.

**INTERNATIONAL****Foreign Service Officer**

Analyze and report on political and economic developments, including agricultural trends, humanitarian and social conditions. Identify export markets, negotiate international agreements, and interpret US policies and interests for foreign governments, opinion leaders and the public. Issue visas to foreign nationals, provide development assistance, and arrange cultural exchanges.

**Import/Export Agent**

Coordinate settlements between domestic and foreign sellers and buyers. Oversee delivery of goods, supervise shipping and receiving, and act as trade representative. Oversee assessment of import and export taxes and handle any customs concerns.

**Intelligence Officer**

A member of the armed forces, police officer or civilian intelligence agency who specializes in the gathering, fusion and analysis of information and intelligence in order to provide advice to their government or another organization.

### **Peace Corps Volunteer**

Peace Corps Volunteers work internationally in the following areas: education, youth outreach, and community development; health and HIV/AIDS; agriculture and environment; business development; and information technology. Within these areas, the specific duties and responsibilities of each volunteer can vary widely. MEDIA/PUBLISHING

### **Copy Editor**

Act as liaison between author, editor, and proofreader. Review manuscripts for grammar and style usage. May develop in-house style guide, supervise freelance staff, and handle author queries. Science degree is helpful for scientific publishing company and science textbook publisher.

### **Grant Writer**

Write and develop grant proposals, which includes conducting needs assessments and matching product needs with available funding. Work for government or non-profit agencies.

### **Science Writer**

Explain and describe scientific concepts and terminology in clear, simple language. Write textbooks, instruction manuals, documentary scripts, grant proposals, marketing materials, and website content. May specialize in areas such as marketing and public relations or medical writing. Conduct research, read background information, and interview scientists and experts. Work for companies, government agencies, nonprofit organizations, or on a freelance basis.

### **Scientific/Environmental Journalist**

Investigate and write about issues of scientific and environmental interest, such as land conservation, pollution, and gene therapy. Investigate leads and tips, research topics, analyze documents, observe events, and interview experts. Work for magazines, newspapers, media companies, nonprofit organizations, or on a freelance basis.

### **Staff Writer**

Research and write articles for magazine. May write article promos, short features, author bios, or photo captions. May work on freelance basis or for one particular magazine.

## **RESEARCH**

### **Information Broker**

Perform research for clients in business, healthcare, government, law, and science. Use Internet, database, and library resources to find specific information. May also analyze information, write reports, and train clients in information retrieval. Often work for consulting firms or on freelance basis.

### **Market Research Analyst**

Research market conditions in local, regional, or national areas to determine potential sales of a scientific or technical product or service. May gather information on competitors, prices, sales, and methods of marketing and distribution. May use survey results to create a marketing campaign based on regional preferences and buying habits.

### **Publications Researcher**

Research story and script ideas; maintain research files on topics and people; verify stories for accuracy. Work for newspaper, magazine, or book publishers, especially those related to science.

### **Public Policy Analyst**

Provide information and suggest scientific policy initiatives to policy makers. Present findings to interested organizations and the media, analyze effectiveness of previous policies, and recommend changes based on findings.

### **Science Technician**

Provide technical and laboratory support to scientists and engineers in manufacturing, research and development, and quality control. Assist with the development and evaluation of laboratory procedures, data interpretation, and problem solving. Collect data, monitor experiments, verify and analyze information, write technical summaries, and maintain lab supply inventories.

## SOURCES

Career Opportunities in Science by Susan Echaore-McDavid.  
Checkmark Books, 2003.

Careers in Health Care by Barbara Swanson. McGraw- Hill, 2005.

The ECO Guide to Career that Make a Difference by The  
Environmental Careers Organization. Island Press, 2004.

American Chemical Society: *www.chemistry.org*

Career Information on About.com: *careerplanning.about.com/*