

Careers involving Chemistry



A qualification in chemistry opens doors to a wide range of careers. Chemistry is involved in our everyday lives and there is a vast range of jobs and careers open to those who have studied chemistry at any level; great career opportunities exist both inside and outside the lab. Nobody knows what the jobs of the future will look like, but many of them will be created in chemistry to solve global challenges such as human health, energy and the environment.

See how chemistry is used today, and will be used in the future.

Not all chemists wear white coats!

As well as practical knowledge of the subject, chemistry students develop many other skills prized by employers such as problem solving, numeracy, communication, creativity and data analysis. Gaining these skills means that you can have a future in all sorts of careers from finance to public relations

A Bachelor of Science in Chemistry is far more than a badge of academic achievement. It's also the foundation for a number of health science careers. Specialized training in medical and laboratory sciences often takes place at the post-baccalaureate or graduate level.

In order to get a slot in a competitive program, a person needs the right academic background; there may be a long list of natural science prerequisites. Some careers, both in the clinic and in the laboratory, are especially well suited for a person with a chemistry degree. Here is a look at some of the hottest healthcare careers for chemistry majors, in both direct care and laboratory settings.

Medical Laboratory Scientist

Laboratory science is a classic career choice for chemists. Medical laboratory scientists prepare and analyze medical specimens and report their findings. Samples may be analyzed for anything from lipids or viral count to alterations in DNA or RNA. Some laboratory scientists advance to develop protocols or participate in research. Laboratory scientists often have a post-baccalaureate education, entering NAACLS-accredited clinical laboratory science programs with a biology or chemistry major. It is possible to earn multiple certifications; a chemistry major might end up becoming both a Medical Laboratory Scientist and a Technologist in Chemistry. It's not necessary to complete two educational programs for these related roles.

Another possibility is to become a pathologist assistant. This is a separate track and entails completion of an NAACLS-accredited PA program. Forensic science represents yet another career choice. Forensic scientists also analyze samples; unlike other laboratory scientists, they focus on materials collected from a crime or accident scene. Samples may consist of human tissue or of other materials picked up at the crime scene.

Biomedical Chemist

There is also demand for biomedical chemists working at the graduate level. Original research generally requires a PhD or similar level of education, but those with lower levels of education can work in an assistive role; biomedical internships are available at virtually every level. PhD biomedical chemists research many of the same things that MDs do. The main difference is that they don't apply their knowledge to patient treatment. Learn more about Biomedical Chemists.

Industrial Hygienist or Toxicologist

Industrial hygienists apply scientific knowledge to evaluate and improve workplace safety. Chemistry is among the preferred majors for post-baccalaureate or graduate study in the field. Those considering this path can turn to the American Board of Industrial Hygiene for certification information. Learn more about Industrial Hygienists and Toxicologists.

Physician Assistant

Physician assistants, or physician extenders as they're sometimes termed, carry out many duties that used to be reserved for MDs. They typically enter

competitive master's programs with a BS in a healthcare or a science related field. The admission process is selective and generally requires clinical experience as well as academic aptitude. Requirements vary. In some cases, a stint as a certified nursing assistant is sufficient to show you have what it takes. Learn more about Physician Assistants.

Veterinarian

Veterinary science is not for everyone, but those who have the passion and dedication will find that their undergraduate chemistry degree serves them well. Veterinary school admission is academically competitive, and high scores in chemistry classes can tip the balance in your favor. It is common for veterinary schools to require 32 – 36 semester hours of science prerequisites. There is typically a higher chemistry requirement even than a biology one.

Veterinary schools typically turn away more students than they admit, however. In order to be a strong candidate for veterinary school, you'll also need some related experience. You might consider volunteering at a clinic or animal shelter. You might also try looking for a paid position as veterinarian assistant. Learn more about Veterinarians.

The main employers of chemistry graduates are in the chemical and related industries, such as:

- agrochemicals
- metallurgical
- petrochemicals
- pharmaceuticals
- plastics and polymers
- toiletries.

However, you'll also find opportunities with employers in many different sectors, including the food and drink industry, utilities and research, health and medical organisations, the government and scientific research organisations and agencies.

You could also be employed in schools, colleges and universities, as well as by computer software development companies, environment consultancies and water companies.

If you wish to pursue a career in chemistry, be prepared to undertake further study; many roles require you to have a masters degree or a PhD in a particular

field. For example, if you wish to become a medicinal chemist, you are likely to need an MSc or MChem in medicinal chemistry. Some universities offer scholarships, but many postgraduate students either self-fund or take out a government loan.

Careers directly related to chemistry include:

- Analytical chemist – assess the chemical structure and nature of substances. Analytical chemists may work in areas such as pharmaceuticals or quality control.
- Medicinal chemist – work in the early stages of drug discovery.
- Environmental chemist – examine the presence and effects of certain chemicals in soil and water.
- Research chemist – can research almost any branch of chemistry.
- Forensic scientist – examine traces of substances such as blood, hairs, fibres, paint and drugs.
- Scientific journalism or publishing.
- Teaching or lecturing.

What other jobs can you do with a chemistry degree?

Some careers are open to graduates with a degree in any subject. These include:

- Finance and accountancy
- Law
- The media
- Business (eg sales, marketing and PR)
- IT
- The public sector.

Chemistry degree skills you can use in your career

You will gain a range of chemistry-specific and transferable skills, all of which are valued by employers. These include:

- The ability to learn, understand and apply complex scientific concepts.

- An analytical and evaluative way of thinking.
- Numerical and computational skills, gained from using relevant mathematical equations and specialist equipment.
- The ability to handle and store hazardous chemicals and to conduct experiments safely and accurately.
- Creativity, gained from designing experiments and finding solutions to problems.
- Research skills, gained from working on original projects.
- Strong oral and written communication skills, gained from writing reports and giving presentations.

There are lots of career options for someone with a degree in chemistry. In fact, a chemist can work almost in all industries and government agencies. This is because chemistry covers every aspect of life.

Careers in chemistry can be grouped into four categories: careers in industrial chemistry; academics, government, and careers in related fields.

- Careers in Industrial Chemistry

The chemical, petrochemical, pharmaceutical, food processing, breweries, and other industries are areas where most chemists usually seek for employment after completing their studies. There are wide varieties of careers for chemists there, including working in the business side of the firm, such as sales and customer support departments. Here are some of them.

Research and Development Chemist: Research and development chemists help their companies to research and discover ways to improve on their products so as to provide more and better value for the customer and thereby remain competitive in the market. They also discover new marketable products which brings more revenue to their companies.

For instance, chemists in the cosmetics industry use their knowledge of chemistry to research and develop new fragrances, skin treatment solution, dyes, and other formulations that the company can market. Research and development chemists usually have PhD in chemistry fields; however, there are still numerous opportunities for BS or MS degree holders to work in the research and development department as technicians performing researches under the supervision of the chemist.

Quality Control Chemist: Quality control chemists in the industry help to check that the quality of their company's products is up to the desired standard before they are released into the market.

Production Chemist: Production chemists are responsible for translating the new products developed by the research chemists into something that can be mass produced by a manufacturing process. In performing their job, production chemists work closely with plant engineers in coming up with the right design of plant equipment to use for better productivity and costs. Production chemists supervise production and make sure production process complies with environmental protection policies. They also check quality control.

Food Chemist: In the food processing industry, food chemists use their knowledge of chemistry to create foods with desirable qualities, such as better taste, longer shelf life, improved nutrition, healthy and safe to consume.

Chemical Sales Career: Chemists can pursue sales careers in the chemical industry. Chemical manufacturing companies need people with chemistry background to sell their products directly to target customers. Chemists are able to work with customers and to determine the type of products that would best enable the customer to realize their goal.

This job involves one-on-one dealings with customers and so requires a great degree of interpersonal relationship skills.

Chemical Marketing Career: Chemists can also be involved in the marketing of chemical products. In addition to their chemistry background, chemists who wish to pursue a career in marketing will need to take some training in marketing.

As a marketing professional, you will be involved in all processes that adequately publicize and compel target customers to buy your products. The job entails identifying and understanding your target customers and designing effective marketing strategies to reach and make them buy from you. It also involves studying sales and trends to predict the future.

Technical Service Career: The technical service professional's job involves helping customers to solve problems relating to the workability of the product and troubleshooting for customers with problems, questions or challenges. It also involves generating new applications for the products and creating instructional manuals to guide customers on how to use the products.

- Chemistry Careers in Schools

Schools offer the second largest places after the industries where graduates of chemistry can work. Chemistry teachers are needed to impart chemistry knowledge to students in high school, community college, college or university.

High School Teacher: All high schools need chemistry teachers to teach the subject. To teach in a public school you will also be required to have an additional qualification in education. Private schools may not however demand education qualification; with a B.S. degree in chemistry you can be hired directly.

Community College Teacher: Graduates with MS or PhD degrees in chemistry are qualified to teach general and organic chemistry in community colleges.

Undergraduate College or University Teacher: To be faculty member in a primarily undergraduate institution, you will almost need a PhD in chemistry. Your work will include to teach classes and labs, and to direct students' research projects.

Teacher at Research Universities: You will need to have PhD and some years of post doctoral experience may be required to be faculty in research universities, which offer BS, MS, and PhD degree programs. You will be involved in teaching undergraduate and graduate courses, and directing research projects for groups of undergraduate and graduate students.

Careers in Support Positions: With background in chemistry, you can work in a number of support positions that require technical background in colleges and universities. These job positions include lab technician and staff scientist, safety officer, and stockroom manager.

The lab technician and staff scientist operates research equipment and performs support duties for teaching and research. The safety officer is responsible for handling and disposing of harmful waste, and to ensure that all safety guidelines, including EPA are enforced. The storeroom manager is responsible for ordering and maintaining inventories of chemicals and supplies to support the schools research and teaching programs.

- Chemistry Careers in Government

A variety of job opportunities are available for graduates of chemistry in all levels of government – federal, state, and local government. For instance, the

federal government runs national research laboratories across the country, which employ BS, MS and PhD graduates, including those with chemistry degrees, to research on a wide range of issues.

Other places that chemistry graduates can find employment with government are in government's regulatory agencies, such as the ATF, EPA, FBI, and FDA. These agencies employ chemists to carry out research and analysis so as to be able to effectively perform their role.

Also, chemists can build careers in forensic science and work with local, state, or national forensic science laboratories. This is because forensic science is based mainly on analytical chemistry and biochemistry.

- Careers in Related Fields

Graduates of chemistry can also build career in non-core chemistry fields based on their training, which makes them suitable for such jobs. Some of these areas include:

Biotechnology: Chemistry and biochemistry graduates are qualified to pursue further training and career in biotechnology if they so desired.

Toxicology: This is an area interested chemists can get further training and build a career. Toxicologists study toxic substances to find out how they produce their effects and so create solutions for dealing with them. Some industries, including manufacturers of therapeutic drugs, cosmetics, food additives, and agriculture chemicals are often required by federal laws to perform thorough testing on their products before they are released into the market.

These industries therefore are compelled to employ toxicologists to perform the required tests and confirmation of the safety of their products.

Environmental Science: This is an area open to chemistry graduates to make a career. This is because chemistry is central to the study of the environment. As environmental scientists, you can work in the industries, with government, not-for-profit organizations, and in the colleges.

Dietary Science: With chemistry background, you can build a career in dietary science after taking some courses to properly integrate you into the profession. Dietary science is the study of how what we eat affects our health and well being.

Career in the Medical Professions: If you are interested in pursuing medical careers such as being a medical doctor, pharmacist, dentist, veterinarian, and nursing, your degree in chemistry can qualify you to be admitted into the training program for the particular course.

Medical Laboratory: Chemistry background can enable you to work as laboratory technician in medical offices and hospitals. Medical lab technicians analyze patient samples for doctors to be able to effectively diagnose diseases. They may also be required to prepare drugs and other materials used in treating patients.

Technical Writing: If you have writing skill and are interested in combining it with your chemical training, technical or scientific writing is a good career path you can take. There are opportunities for technical writers to work for trade magazines and technical journals. You can also work as a writer in the industries to produce product manuals and other informational materials that enable the company to inform its customers about its products in the way that they will understand. A course in English and/or Journalism would help to achieve success in this profession.

Scientific Libraries: With a background in chemistry and some training in library science, you can work in science libraries. If you did a graduate study in library science, you could work as research librarian with government libraries and university research libraries. You could also work with large companies as a research librarian.

Museums: A background in chemistry combined with training in information technology can qualify you to work in museums. Your work may involve researching and producing materials for exhibits, making presentations, and procuring materials for the museum.

Patent Agency: A degree in chemistry can enable you to work as a patent agent with the federal government. The job involves analyzing patent applications to confirm if they are actually novel and worthy to be awarded a patent. The analytical skill which you gain from studying chemistry makes you suitable for the job.

Patent Law: You can become a patent lawyer after your chemistry degree by going to law school. The job of patent lawyers include helping scientists to prepare patents that are legally enforceable; helping their clients or employers

to ensure that their patents rights are not infringed on; and going after those who infringe on their clients or employers patents.