

Career Profile: Analytical Chemist

An analytical chemist applies chemical science to industrial processes and carries out tests and analyses to investigate the chemical composition of substances and to identify their various elements and compounds. The purpose of such analysis is to identify and understand the substance and how it behaves under different conditions, and also to detect the presence of residues.

Analytical chemists may work in health laboratories, water, food, cosmetics, and oil exploration industries. They also identify the presence of pollutants in soil, water and air. The analytical chemist has a crucial role in the pharmaceutical industry through the drug development process by studying the physical or chemical properties of drug substances and formulations, for the purpose of drug quality and stability.

Typical work activities include:

- analysing samples from various sources to provide information on compounds or quantities of compounds present;
- using analytical techniques and instrumentation, such as gas and high performance liquid chromatography (HPLC), ion chromatography, electrochromatography and spectroscopy (infrared and ultraviolet, amongst others);
- interpreting data and adhering to strict guidelines on documentation when recording data;
- reporting scientific results;
- using a range of analytical techniques, instrumentation and software;
- developing new techniques for the analysis of drug products and chemicals;
- working collaboratively in cross-functional teams;
- liaising with customers, staff and suppliers;
- using the internet and email;
- being aware of, and keeping up to date with, health and safety issues in all aspects of the work undertaken.

An interesting trend is that interactions among specialists are increasing. One type of chemist frequently relies on the findings of another type of chemist such as an organic chemist needing to understand the findings of the identity of compounds prepared by an analytical chemist.

Education Requirements

National Senior Certificate (NSC)

For a career as an analytical chemist students are advised to select English, Mathematics, and Physical Science and to add to this a selection from the designated subjects. These are subjects that are particularly suitable for tertiary study.

Bachelor Degree

Bachelor of Science in Chemistry – (3 years) A three year degree programme that focuses on developing knowledge and skills for entry into careers in the field of chemistry. **Offered at:**

- [North-West University](#)¹ (Faculty of Natural Sciences)
- [University of South Africa](#)² (Department of Chemistry)
- [University of Johannesburg](#)³ (Department of Chemistry)
- [University of Limpopo](#)⁴ (Department Of chemistry)
- [University of Pretoria](#)⁵ (Department of Chemistry)
- [University of Venda](#)⁶ (Chemistry Department)
- [University of the Witwatersrand](#)⁷ (School of Chemistry)

National Diploma / BTech

Students who prefer a more practical approach can enrol for programmes to qualify as analytical chemistry technologist and technician at BTech and Diploma levels. The South African Chemical Institute is the official professional institute for chemistry in South Africa. To register as a member, you need to have completed four years of study in any branch of chemistry with a degree, diploma or certificate and engaged in full-time chemical work or further study in chemistry for a further three years.

Admission requirements

As admission requirements vary from one institution to another, find out what the specific requirements are by checking on the website and contacting the university if you have any queries.

¹ http://www.puk.ac.za/fakulteite/natuur/chem/index_e.html

² <http://www.unisa.ac.za/Default.asp?Cmd=ViewContent&ContentID=220>

³ <http://www.uj.ac.za/Default.aspx?alias=www.uj.ac.za/chemistry>

⁴ <http://www.ul.ac.za/index.php?Entity=chemistry>

⁵ <http://web.up.ac.za/default.asp?ipkCategoryID=2047>

⁶ http://www.univen.ac.za/math_natural_sciences/chemistry.html

⁷ <http://web.wits.ac.za/Academic/Science/Chemistry/Home.htm>

Possible Employers

- Atomic Energy Commission (AEC)
- [AECI](#)⁸
- [Council for Scientific and Industrial Research](#)⁹ (CSIR)
- [Department of Agriculture](#)¹⁰
- Educational institutions
- Eskom
- Food processing companies – SASOL, AECI
- General industry, e.g., mining, transport, cement, paper, iron and steel
- Government departments
- Industries dealing with pharmaceuticals, agricultural products, foods, biotechnology products, paints, plastics and polymers, cleaning agents, cosmetics, and textiles
- Industry service organisations – Sugar industry
- Large oil companies
- [Council for Mineral Technology](#)¹¹ (MINTEK)
- [SASOL](#)¹²
- Sentrachem
- [South African Bureau of Standards](#)¹³ (SABS)
- Research – [Agriculture Research Council](#)¹⁴ (ARC)

Find out more

Find out more about hydraulics and mechanical engineering, bursaries and jobs:

- [South African Chemical Institute](#)¹⁵ has an extremely useful brochure on various careers in chemistry on its website.
- [Go Study](#)¹⁶ gives very useful information on chemistry as a career with specific information on industrial chemistry.
- [Southern and Eastern Africa Network of Analytical Chemists](#)¹⁷ (SEANAC) was formed to address key problems in Africa.
- [Labhouse – Unique Laboratory Business Solutions](#)¹⁸ provides, among others, an outline of the career of Sello Boikhutso who spent some time as an analytical chemistry technician.

⁸ <http://www.aeci.co.za/>

⁹ <http://www.csir.co.za/>

¹⁰ <http://www.daff.gov.za/>

¹¹ <http://www.mintek.co.za/>

¹² <http://www.sasol.com/>

¹³ <https://www.sabs.co.za/>

¹⁴ <http://www.arc.agric.za/>

¹⁵ <http://www.saci.co.za/index.php?page=110&title=Chemical+Education>

¹⁶ <http://www.gostudy.mobi/Careers/View.aspx?oid=89>

¹⁷ <http://www.seanac.org/>

¹⁸ <http://www.labhouse.co.za/index.asp?pgid=34>

Are you suited to this career?

This quick quiz can help you to identify whether you are suited for this occupation. The questions are based on interests, characteristics and values typical of people who work as engineers.

QUIZ	YES	NO
Do you find chemistry interesting?		
Do you enjoy Mathematics and Science?		
Can you concentrate on detail?		
Are you interested in solving problems?		
Do you enjoy working with the latest technology and machinery?		
Is accuracy in your work important to you?		
Are you creative and do you persevere when faced with a problem?		
Do you find it easy to organize and plan your work?		
Do you work well with other people and communicate clearly with them?		
Are you patient and persevering?		

If you have mainly yes answers it may be an indication that this is an occupation to consider.