Chemistry

Introduction

Chemistry is a branch of physical science that studies the composition, structure, properties and change of matter. Understanding how it behaves, what it's made of, and what properties it has are the chief goals of those that study chemistry.

Chemistry is the study of structural transformations of matter and their implications in wide ranging contexts - from materials science to living biological systems.

Viewed from this over-reaching perspective, it is clear that the understanding of the fundamentals of this subject is essential to finding solutions for many of the immense challenges facing mankind today - starting from water purification, environmental remediation, development of environmentally benign chemical process and novel materials for sequestering solar energy and storage, to unraveling molecular mechanisms for disease and the development of new molecules for their cure.

Study of chemistry will provide students with the requisite fundamental knowledge base to begin researching in many of these interdisciplinary areas that straddle conventional disciplines, such as with physics, biology and engineering

Skill Set

- Critical Thinking
- Complex Problem Solving
- Judgment and Decision Making
- Scientific and technical knowledge
- Patience and determination
- Flexibility
- Excellent analytical skills
- Teamwork and interpersonal skill

What a Chemist do for Living?

A chemist gets to transform mundane, everyday stuff into incredible things. Some discover cures for AIDS, a few keep check of the ozone activity and there are chemists who help create utilities that make life easier by implementing concepts such as induction, hydration and malleability.

Who do you think ensures the smell and taste of chocolates or roses? – **Chemists!** – They are the ones who check if your deodorants and antiperspirants are operating properly and also evaluate the perfume.
Sounds much better than a boring desk job?
How tasty was what you ate for breakfast?
Chemists play a major role in creating foods that are tempting to our palette. Chemists also ensure that foods are well-preserved and safe and worth buying from supermarkets.

Job Prospects

- **Healthcare Scientist -** Sometimes known as clinical scientists - work at the cutting edge of medicine, researching and developing new treatments and equipment. Most of their work is done in laboratories, although some does involve patient care.
- **Forensic Scientist -** Collect, preserve, and analyze scientific evidence during the course of an investigation. While some forensic scientists travel to the scene of the crime to collect the evidence themselves, others occupy a laboratory role, performing analysis on objects brought to them by other individuals.
- **Pharmacologist -** are knowledgeable professionals who focus their work into researching and understanding the chemical processes that take place between living organisms and different substances and compounds. The main purpose of a Pharmacologist is to create, develop, and test new medications.
- **Toxicologist -** is a scientific discipline, overlapping with biology, chemistry, pharmacology, and medicine that involve the study of the adverse effects of chemical substances on living organisms and the practice of diagnosing and treating exposures to toxins and toxicants.

- **Chemical Engineers -** design, create and optimize the systems and equipment used in chemical, industrial, biological and environmental processes. They produce a range of materials, from fuels and fertilizers to processed foods, beer and wine, polymers and pharmaceuticals.
- **Analytical Chemist -** chemist is a scientist that studies and tests the chemical composition and behaviors of many different substances
- **Science writer -** write and edit scientific news, articles and features, for business, trade and professional publications, specialist scientific and technical journals, and the general media. Science writers need to understand complex scientific information, theories and practices.
- **Food Chemist -** work in food production plants, studying the ingredient lists in foods. Then you rearrange, substitute, and alter those ingredients until you come up with new flavors or healthier content.

Top Colleges

- **Indian Institute of Science (IISc), Bangalore**
  - **Course:** Bachelor of Science (Research) (Chemistry)
  - **Duration:** 4 years
  - **Eligibility:** The candidates must have secured a first class or 60% or equivalent grade (relaxed to pass class for SC/ST candidates) in the 12th Standard examination whose main subjects include Physics, Chemistry and Mathematics (all three).
  - **Selection Process:** Based on the merit list of one of the following national examinations:
    - Inspire
    - (IIT)JEE-Main
    - (IIT)JEE-Advanced
    - NEET-UG

- **Indian Institute of Technology (IIT)- Kharagpur, Roorkee, Agartala, Durgapur**
  - **Course:** Integrated M.Sc. Chemistry
  - **Duration:** 5 years
  - **Eligibility:** 12th class with Physics, Chemistry, Mathematics PCM.
  - **Selection Process:** JEE-Main + JEE-Advance

- **Indian Institute of Technology (IIT)- Bombay, Kanpur**
  - **Course:** B.Sc. Chemistry
  - **Duration:** 4 years
  - **Eligibility:** 12th class with Physics, Chemistry, Mathematics PCM.
  - **Selection Process:** JEE-Main + JEE-Advance

- **Indian Institutes Of Science Education & Research (IISER) Berhampur, Bhopal, Kolkata, Mohali, Pune, Thiruvananthapuram, Tirupati**
  - **Course:** BS-MS
  - **Duration:** 5 years
  - **Eligibility:** 12th from Science Stream
  - **Selection Process:**
    - INSPIRE
    - Joint Entrance Exam (Advanced)
    - State and Central Boards Channel (**SCB**) (APTITUDE TEST)

- **National Institute of Technology (NIT)- Agartala, Durgapur, Patna, Rourkela, Surat**
  - **Course:** Integrated M.Sc. Chemistry
  - **Duration:** 5 years
  - **Eligibility:** 12th class with Physics, Chemistry, Mathematics PCM
  - **Selection Process:** JEE-Main

- **Delhi University, New Delhi**
  - **Course:** B.Sc. (H) Chemistry
  - **Duration:** 3 years
  - **Eligibility:** The overall percentage in Physics, Chemistry and Mathematics should be 55% and one compulsory language should be 50%.
  - **Selection Process:** CUET

Some Colleges under Delhi University

- Atma Ram Sanatan Dharma College
- Bhaskaracharya College of Applied Sciences
- Daulat Ram College (W)
- Deen Dayal Upadhayaya College
- Gargi College (W)
- Deshbandhu College
- Dyal Singh College
- Hans Raj College
- Hindu College
- Kalindi College (W)
- Kirori Mal College
- Maitreyi College (W)
- Miranda House (W)
- Motilal Nehru College
- Ramjas College
- Shaheed Rajguru College of Applied Sciences for Women (W)
- Shivagi College

- **Christ University, Bangalore**
  - **Course:**
    - (B.Sc.) in Chemistry, Botany, Zoology
    - **(**B.Sc.) Physics, Chemistry, Math
    - (B.Sc.) in Biotechnology, Chemistry, Zoology/Botany
  - **Duration:** 3 years
  - **Eligibility:** Basic eligibility for the program is a pass at the +2 level (Karnataka PUC / ISC / CBSE / NIOS / State Boards) from any recognized Board in India with PCM/PCB.
  - **Selection Process:** Skill Assessment (test on written skills, communication skills and logical reasoning) + Personal Interview + Academic Performance (12^{th}).

- **Mumbai University, Mumbai**
  - **Course:** Bachelor of Science (Hons.) Chemistry
  - **Duration:** 3 years
  - **Selection Process:** Merit Based
  - **Eligibility:** Candidates who have passed/appeared in the 10+2 Examination of the Central Board of Secondary Education, New Delhi or its equivalent Examination conducted by a recognized Board/University/Council with Physics, Chemistry, Biology (PCB) Or Physics, Chemistry, Mathematics (PCM)

- **Panjab University, Chandigarh**
  - **Course:** Bachelor of Science (Hons.) Chemistry
  - **Duration:** 3 years
  - **Eligibility:** Candidates who have passed/appeared in the 10+2 Examination of the Central Board of Secondary Education, New Delhi or its equivalent Examination conducted by a recognized Board/University/Council with Physics, Chemistry, Biology (PCB) Or Physics, Chemistry, Mathematics (PCM)
  - **Selection Process:** Entrance Exam **(**PU-CET)