



Ollscoil Chathair
Bhaile Átha Cliath
Dublin City University



BSc Chemical and Pharmaceutical Sciences – INTRA Programme (DC162)

Overall Objective

Considered by most scientists to be the central science among the science subjects, chemistry has a wide range of industrial applications that affect our daily lives. Chemists develop new materials, drugs and pharmaceuticals and they design cleaner and more efficient reaction processes to produce them. Students from the BSc in Chemical and Pharmaceutical Sciences develop understanding and skills in chemistry within both a theoretical and applied context. The emphasis is on applications and industrial relevance, particularly within the pharmaceutical industry, with the theoretical and practical aspects taught through application. This leads to a familiarity with the basic principles of chemistry, and enables development of an impressive range of problem-solving skills.

Programme Outline

This is a four-year, full-time degree course. The four years are broken down as follows:

Year One: learning and developing essential background knowledge of mathematics, chemistry, physics and biology.

Year Two: building on the foundational subject in year one, with a focus on chemistry and biology relating to pharmaceutical chemistry. In addition, IT and computing skills are developed. Modules include both theoretical and practical chemistry (organic, inorganic, physical, pharmaceutical), biology (biomolecules and bioorganic chemistry), statistics and probability, and visualisation of laboratory data.

Year Three: focuses on preparation for industrial placements, with laboratories in synthesis and analysis of pharmaceuticals, and modules on separation techniques, regulation, data analysis, medicinal chemistry and formulation, as well as advancing knowledge in organic and inorganic chemistry and introduction of computational chemistry.

Year Four: features advanced modules in spectroscopy, organic and inorganic chemistry, as well as a literature review, drug design workshop and a 12-week research project. Students choose between specialist modules in medicinal chemistry or supramolecular and interfacial chemistry.

Work Areas

The potential careers in chemical and pharmaceutical sciences are diverse. The following are just some examples:

- Quality Control – working in a lab in a regulated environment for pharmaceutical, veterinary or food and beverage industries
- Other pharmaceutical manufacturing roles – Quality Assurance, Validation of methods or instruments
- Formulation – investigating stability of formulations of drugs, e.g. injectable, subcutaneous, quick dissolve and more; preparation of cosmetics
- Synthetic chemist – making new molecules, for a range of applications, e.g. materials, pharmaceuticals
- Any area of chemical research, e.g. synthesis, analysis, application, sensors, assay development, etc.





Students are required to complete a six month placement at the end of third year from April-September. Students are available for interview from early October onwards. For more information, contact:

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| Year 1 | Year 2 | Year 3 | Year 4 |
|---------------------------|------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------|
| Chemistry | Organic, Inorganic and Physical Chemistry Labs | Organic, Analytical and Pharmaceutical Chemistry Labs | Advanced Spectroscopy |
| Biology | Spectroscopic Workshop | Separation Technique | Advanced Topics in Organic Chemistry |
| Physics | Organic Chemistry | Organic Chemistry | Bio-inspired Synthesis |
| Maths | Inorganic Chemistry | Organometallics and Polymer Chemistry | Advanced Inorganic Chemistry |
| Interdisciplinary Science | Spectroscopy and Physical Chemistry | Medicinal Chemistry | Advanced Medicinal Chemistry (Option A) |
| | Biomolecules and Metabolism | Computational and Inorganic Chemistry | Interfacial and Supramolecular Chemistry (Option B) |
| | Bio-organic and Pharmaceutical Chemistry | Formulation | Drug Design Workshop |
| | Thermodynamics and Kinetics | Regulation and Data Analysis | Literature Review |
| | Computing | INTRA | Research Project |
| | Probability and statistics | INTRA | |
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