

Higher Diploma / Masters in Applied Science

Analytical Chemistry

Overview of Programmes

The Department of Chemistry offers two postgraduate programmes in Analytical Chemistry at Higher Diploma and Masters level. Both programmes are designed not only to give participants thorough training in the theory, instrumentation and practice of a wide range of analytical techniques, but also to sharpen their skills and initiative in confronting analytical problems such as arise in various areas of Irish industry. The course also aims to introduce candidates to research and method development in analytical chemistry. Opportunities exist for industrial placement both locally and through IAESTE and for exchange of staff and students with other European research laboratories through various EU-supported Socrates networks, linked to UCC.

Entry Requirements

Higher Diploma in Analytical Chemistry

The normal prerequisite for admission to the course is a BSc degree or NCEA Diploma in Science with credit or distinction. The course consists of (i) lectures, (ii) laboratory work on set experiments, and (iii) a short environmental analytical research/development project, which could cover field work.

Full Time Candidates can complete the course over one year and are expected to spend all their time in the College. Two written examinations, based on the lecture and laboratory courses, will be set in the summer examinations. A report, based on literature and project work, must be submitted in early September for approval by examiners.

Part Time candidates can complete the course within a two-year period and will normally have to attend College for one full day (or two mornings), depending on the lecture schedule. (Note: the academic year for lectures is divided into two 12 week periods or terms). Those who can obtain sufficient day release from industry, may be allowed to sit the two written examinations in the first year. Project work can be based in UCC or industry and must be agreed with the course director in advance.

MSc in Environmental Analytical Chemistry

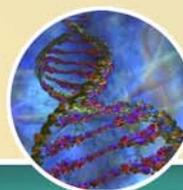
Eligibility

The normal pre-requisite for admission to the course is a First or Second Class BSc Honours degree with significant chemistry content, but consideration can be given to equivalent qualifications in related areas of science and technology. Candidates with proven and relevant industrial experience can be considered for places following interview and assessment by the Professor of Analytical Chemistry or Course Director.



Programme Structure

Full time candidates can complete the course over 12 months from October to September and are expected to spend all their time in the University, unless a suitable agreed project placement in industry or other centre is obtained. The course will comprise of (i) more than 120 hours lectures (ii) laboratory work on set experiments and (iii) an environmental analytical research project. There are three written examinations and an oral interview with an external examiner in the summer, continuous assessment of practical work and on successful completion of a nine month research project. The project research area is assigned, for literature review, at the beginning of the year and research work commences in the second period (term) after completion of the set experiments.



Part time candidates can complete the course within two years and will normally have to attend College for one full day or two mornings depending on the lecture schedules. Those who can obtain sufficient day release from industry may be able to sit the three examinations in the first year. Project work can be based at College or in industry and must be agreed with the Course Director in advance.

Course Content

There are core modules common to both the Higher Diploma and Masters programmes. Lectures chosen from the topic areas listed are provided in a dedicated lecture schedule and through attendance at appropriate modules.

C531 Classical Methods and Spectroscopy

Sampling, sample preparation & data handling. Modern methods of titrimetric, gravimetric and gas analysis. Atomic emission, absorption & fluorescence spectroscopy. Molecular UV, visible, IR and Raman spectroscopy. NMR and mass spectroscopy.

C532 Electrochemical and Thermochemical Methods

Electroanalytical techniques: Conductometry, oscillometry, potentiometry, voltammetry, amperometry and coulometry. Sensors and process analysis. Analysis of materials. Thermal methods: Thermogravimetry, derivative thermogravimetry, differential thermal analysis etc.

C533 Separation Techniques in Analytical Chemistry

Solvent and solid phase extraction, countercurrent extraction, introduction to chromatography. Separation methods include gas and high performance liquid chromatography. Separation by electrophoresis and gel filtration. Method development in LC; chromatography of ions; chiral separations; supercritical fluid extraction & chromatography; capillary electrophoresis.

In addition some module areas are specific to each programme.

Higher Diploma Programme

C537 Environmental Chemical Analysis

Common air pollutants and their sources. Air quality & toxic gas. Sampling of airborne solids and gases. Chemical methods for determining trace gases. Instrumental techniques for the determination of gaseous pollutants. Analytical methods for water quality control; determination of heavy metals and organic micropollutants with emphasis on ion chromatography and GC/MS. Detection & determination of pollutants in soil. Analysis of biological, food & industrial effluents & products. Selected topics in xenobiochemistry, environmental protection agency, legislation and impact assessment.



Masters Programme

C535 Chemometrics and Computerisation

Statistical analysis of experimental data. Collaborative analytical studies. The use of computers in analytical chemistry. Quality assurance and validation in industry

C536 Miscellaneous Methods and Applications

Kinetic, catalytic & enzymatic methods of analysis. Bioanalytical, pharmaceutical and environmental analysis. Selected topics of current and specialised interest.

Application Procedure

Early application is advisable since the number of places is limited. Application forms are available from:

The Postgraduate Admissions Office
University College Cork
Tel: +353-21-490-2876

Full time candidates seeking financial support as postgraduate demonstrators should fill in the appropriate section on the application form.

Prospective candidates are invited to contact analytical chemistry staff:

Professor J.D. Glennon Tel: +353-21-490 2208/4902379
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