



University of Glasgow | Faculties of  
Science

# Environmental chemistry

## Undergraduate study 2010





Faculties of Science

## Environmental chemistry

### Introduction

There are many reasons for choosing our successful department as your place of study, including our standards in teaching and research, and our flexible Honours programmes.

- Our department is part of the Scottish research pooling initiative, ScotCHEM. This is a major collaborative venture for the sharing and enhancement of resources for chemistry research in Scotland. Our strong research base has a direct impact on our teaching.
- We help you to achieve success after you have graduated by offering employability and professional development training to all our students in years one and two of our degrees. Many of our students also obtain summer placements in industry between third and fourth years.

Our undergraduate degree programmes are varied and flexible. Admission is initially into the Faculties of Science. This system allows you to explore a range of subjects in addition to chemistry itself before specialisation – a great way of broadening your scientific horizons.

Studying environmental chemistry will provide you with a thorough training in the scientific basis behind environmental topics, allowing you to take an informed and balanced view of major environmental issues.

The need to produce food stocks to meet the demands of an increasing world population is a key problem today. Increases in production on the required scale necessitate a heavy commitment of scientific resources. However, the balance between food production and environmental protection is shifting in favour of the environment.

The same is true of the balance between industrial production and environmental protection, as the legacy of major environmental problems such as global warming, acid rain and water pollution are tackled. In developing countries there is a considerable need for an increase in agricultural production and industrialisation. Much is required of environmental chemists if these advances are not to be at the expense of the local or global environment.

### Come and visit us

#### Open Day

[www.glasgow.ac.uk/openday](http://www.glasgow.ac.uk/openday)

In June and September we hold an Open Day to allow you, your family and teachers to visit us on campus and see a little of the city.

Open Day allows you to speak to staff in academic departments, find out more about courses, tour the facilities, visit student accommodation and see for yourself what life would be like as a student at Glasgow. If you have a long way to travel you can also stay in one of our student residences.

#### Alternative visiting arrangements

Open Day is the best way for you to get a comprehensive picture of what being a student here would be like. However, if for any reason you can't make it on that date, then we will be able to make alternative arrangements. To find out more visit: [www.glasgow.ac.uk/afternoonvisits](http://www.glasgow.ac.uk/afternoonvisits)

#### Applicants' Visit Day

At Glasgow we go the extra mile. If you receive an offer of a place at Glasgow, we will invite you to visit us before making your final decision. Applicants' Visit Day usually takes place in March. Details will be sent to you together with your offer of a place.

### Faster Route programmes

These might be of interest to you if you: are highly qualified at A-level or Advanced Higher level in relevant subjects; are motivated and keen to pursue an Engineering/Science degree with maximum concentration on the subject; wish to complete your degree faster than the normal time frame.

For further information about entry requirements visit [www.glasgow.ac.uk/undergraduate/degrees/entryrequirements](http://www.glasgow.ac.uk/undergraduate/degrees/entryrequirements)

## Environmental Chemistry

### Typical offer

<b>Highers</b>	BBBB, preferably with two science subjects
<b>A-levels</b>	BBB, preferably with two science subjects
<b>IB</b>	30 points including three science subjects

For entry requirements visit [www.glasgow.ac.uk/undergraduate/degrees/entryrequirements](http://www.glasgow.ac.uk/undergraduate/degrees/entryrequirements)

This degree programme offers specialist training in the chemistry and behaviour of the natural environment and the effects of human activity on it.

### What can I expect in first year?

There are two possible routes towards studying Environmental Chemistry.

#### Route 1

In your first year you will study **Chemistry 1** together with two other subjects. The topics covered include:

- the periodic table and main group chemistry
- transition metal chemistry
- organic chemistry
- chemical kinetics
- theoretical chemistry
- chemical energy changes
- aqueous equilibria and pH
- macromolecules.

#### Route 2

If you have appropriate pre-university qualifications in chemistry, you can study **Environmental science 1** together with two other subjects.

**Environmental science 1** is an introductory course providing an integrated multidisciplinary approach to the science of the environment. It is taught by a team drawn from the Departments of Chemistry, Geographical & Earth Sciences, Physics & Astronomy and the Institute of Biomedical & Life Sciences.

The course covers a wide range of environmental topics in four sections:

- the physical world (eg continental drift, earthquakes, climate)
- the biological world (eg the diversity of plants, animal ecology, human populations)
- soils and pollution (radioactivity, soils, the ozone layer)
- the Earth's resources (energy reserves, energy from biomass, green politics).

### What can I expect in second year?

In second year half your time is spent studying **Environmental chemistry 2A** and **2B** and half is spent studying another subject.

**Environmental chemistry 2A** aims to give you a broad introductory overview of the application of chemical principles to the environmental processes occurring in the soil-water-plant-atmosphere system. The chemistry of environmental materials and processes and the chemical analysis of environmental samples are strongly emphasised to provide a sound scientific background for understanding environmental problems and for monitoring, controlling and cleaning up pollution.

The topics in this course are:

- introduction to the natural environment and environmental processes
- the soil and sediment environments
- the aquatic environment
- the atmospheric environment
- the biological environment
- biophysical processes in the environment
- environmental cycles.

**Environmental chemistry 2B** tackles the dilemmas caused by pressure on the natural environment, the impact of agrochemicals such as fertilisers, the industrial pollution of the atmosphere and water resources and the safe disposal of waste products such as sewage and refuse.

The topics in this course are:

- agricultural systems and pollution
- water pollution
- pollution of land
- atmospheric pollution.

### What happens next?

If you successfully complete the courses in first and second years, you may progress to Honours. Your third, fourth – and if you choose to study for an MSci degree, fifth – years at university depend on your choice of Honours subject. We offer the following programmes:

- BSc in Environmental Chemistry
- MSci in Environmental Chemistry
- BSc in Environmental Chemistry & Geography
- BSc in Environmental Biogeochemistry.

### Bsc in Environmental Chemistry

In your third and fourth years, you will cover a broad spectrum of fundamental and applied environmental topics, including:

- the chemistry of soils
- principles of analysis
- reclamation of industrially contaminated land
- pesticide residues in food
- water pollution.

In each topic, the emphasis is on the practical aspects, providing hands-on experience of analytical equipment and methods and opportunities for fieldwork. Project work is also important.

Examples of recent projects include:

- surveys of river water quality
- an evaluation of metal contaminated urban sites
- investigations of pesticide residues in potato crisps.

The course team includes experts who work daily in the environmental field including professional chemists from:

- the Scottish Environment Protection Agency
- the Scottish Universities Environmental Research Centre
- the Scottish Agricultural College, Auchincruive
- local authorities and industry.

Environmental chemistry borders on biology, earth science and geography, making the **job prospects of chemists excellent.**

[www.glasgow.ac.uk/chemistry](http://www.glasgow.ac.uk/chemistry)





## MSci in Environmental Chemistry

The MSci degree involves your fifth year spent on work placement with a company carrying out a research project.

You will write a report on your placement year. This is assessed as part of your final degree classification. You will also give a presentation on your placement to the department.

## Bsc in Environmental Biogeochemistry

Environmental biogeochemistry is about water:

- where it comes from
- what is in it
- where it goes to
- how it affects us and other living creatures as it moves around the planet.

In first year you will study courses in chemistry and earth science. You are also encouraged to study environmental science, where you will learn about a wide range of environmental issues taught by staff from different scientific disciplines. In the following year you will study environmental chemistry and earth science.

No single science covers the study of water. Environmental Biogeochemistry addresses this by providing a cross-disciplinary programme drawing on expertise from more than one university department.

In the first two years of this programme you will study Earth Sciences alongside the Environmental Chemistry courses for Level-1 and Level-2.

Increasingly the constant cycle of water is affected by human activities, adding to the already complex series of reactions which control the availability and quantity of water and hence its environmental and human health consequences. In examining this, we put the emphasis on analytical techniques, with hands on experience of a wide range of equipment. Fieldwork also plays a major part in the degree, examining the natural cycling of water and involving you directly in environmental issues.

In your final year, you will undertake a dissertation, the topic of which you can suggest on the basis of your own interests, and a laboratory project involving independent fieldwork, assessing water and sediment quality issues, and the likely consequences of natural or human-related changes.

## Bsc in Environmental Chemistry & Geography

In the first two years of this programme you will study Geography alongside the Environmental Chemistry courses for Level-1 and Level-2.

If you progress to Honours you will take a series of specialist courses. No single science covers the aspects taught in this programme. This is addressed by drawing on expertise from more than one University department. We provide an integrated approach to the physical environment via a study of:

- the structure of surface environments
- their dynamics
- their management for the sustainable use of resources.

There is a strong emphasis on analytical skills, with a research project in environmental chemistry being undertaken in your final year as well as a dissertation in geography. Fieldwork is an important part of the work of both disciplines. Also included in the course is training in skills such as:

- data handling
- report writing
- oral presentation.

### Can I study abroad?

The University has an extensive range of student exchange programmes with universities in Europe, North and South America, Canada and Australia. If you opt to study for an MSci, your placement year can be taken abroad.

**The University holds a Study Abroad Fair every November. Information is also available on our website:**  
[www.glasgow.ac.uk/studying/exchange](http://www.glasgow.ac.uk/studying/exchange)

### What are my career prospects?

There is a strong demand by employers for Honours and Joint Honours graduates of the degree in Environmental Chemistry, for example:

- with environmental consultancies – especially in relation to contaminated land and water
- as research chemists in industry where more emphasis is being given to environmental aspects associated with the introduction of new chemicals
- as analytical chemists in industry where emphasis is given to the uniformity and overall quality of the final product.

Some also take up employment in teaching as well as in various government organisations.

### Where can I find out more?

Our website has information about our department and all of the Chemistry-related degrees we offer: [www.glasgow.ac.uk/chemistry](http://www.glasgow.ac.uk/chemistry)

If you have any questions about any aspects of our programmes you can send them to: [ug-enquiries@chem.gla.ac.uk](mailto:ug-enquiries@chem.gla.ac.uk)

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Lonely Planet



www.seeglasgow.com

## City of Glasgow

### What is it like living and studying in Glasgow?

Named as one of the world's top ten cities by independent travel guide *Lonely Planet*, Glasgow attracts the largest student population in Scotland. The city's reputation for friendliness means that wherever you come from, you'll soon treat it as your second home. Glasgow is:

- situated in the central belt of Scotland on the River Clyde
- Scotland's largest city
- home to a population of 600,000.

### Some of the city's many attractions include:

#### Music and nightlife

In an average week Glasgow hosts 123 bands, 72 classical composers, 49 choirs, 38 orchestras and 21 jazz bands. Renowned for discovering acts from Franz Ferdinand to Primal Scream, the city's fantastic live music haunts include King Tut's Wah Wah Hut – voted UK's best live venue by listeners of Radio 1 three years in a row.

More than 700 bars, pubs and nightclubs mean no two nights in Glasgow are the same. Whether you're after a record-breaking 100-foot long bar (the Horseshoe), or a pub with stuffed stags' heads and kilned staff that's as appealing as it is unpronounceable (Uisge Beatha), Glasgow has a venue to suit. Dance until you drop at the Subclub, or revisit 1920s America at the Vegas clubnight on the Renfrew Ferry, it's up to you.

What's more, due to our diverse and multicultural population, you can eat your way around the world in Glasgow restaurants.

#### Festivals

At least one festival every month of the year shows Glasgow loves to celebrate. Some of our favourites include the Glasgow International Comedy Festival, Celtic Connections folk music festival, Glasgay, Glasgow Film Festival and Aye Write!, the city's book festival. In the summer, you're only 50 minutes away from Edinburgh's International and Fringe Festivals by train.

#### Culture

Art lovers and museum wanderers are spoilt for choice, with the city's famous Burrell collection vying for attention beside Scotland's most visited attraction, the Kelvingrove Art Gallery & Museum. Discover live art within the cavernous brick archway spaces beneath Glasgow's Central Station at the Arches, or enjoy 'a play, a pie and a pint' at Oran Mor, a former church that has since been converted into a theatre, bar and nightclub.

#### Sport

Wearing its passion for sport on its sleeve, Glasgow's set to host the Commonwealth Games in 2014. Across the world people know the city as home of Celtic and Rangers football clubs, but with no fewer than 27 public fitness centres including swimming pools, running tracks, 11-a-side pitches and tennis courts, you're guaranteed to find something to get involved with, whatever your level of fitness.

#### Campus culture

Are you craving cosy campus living, or do you prefer big city excitement? Whichever is your style, you'll be impressed by the University's excellent location in the compact and friendly West End of Glasgow. Just two miles from the city centre, with great bus and underground links, the West End has a reputation as the bohemian, trendy and cosmopolitan quarter of Glasgow.

