

MSc COURSES IN

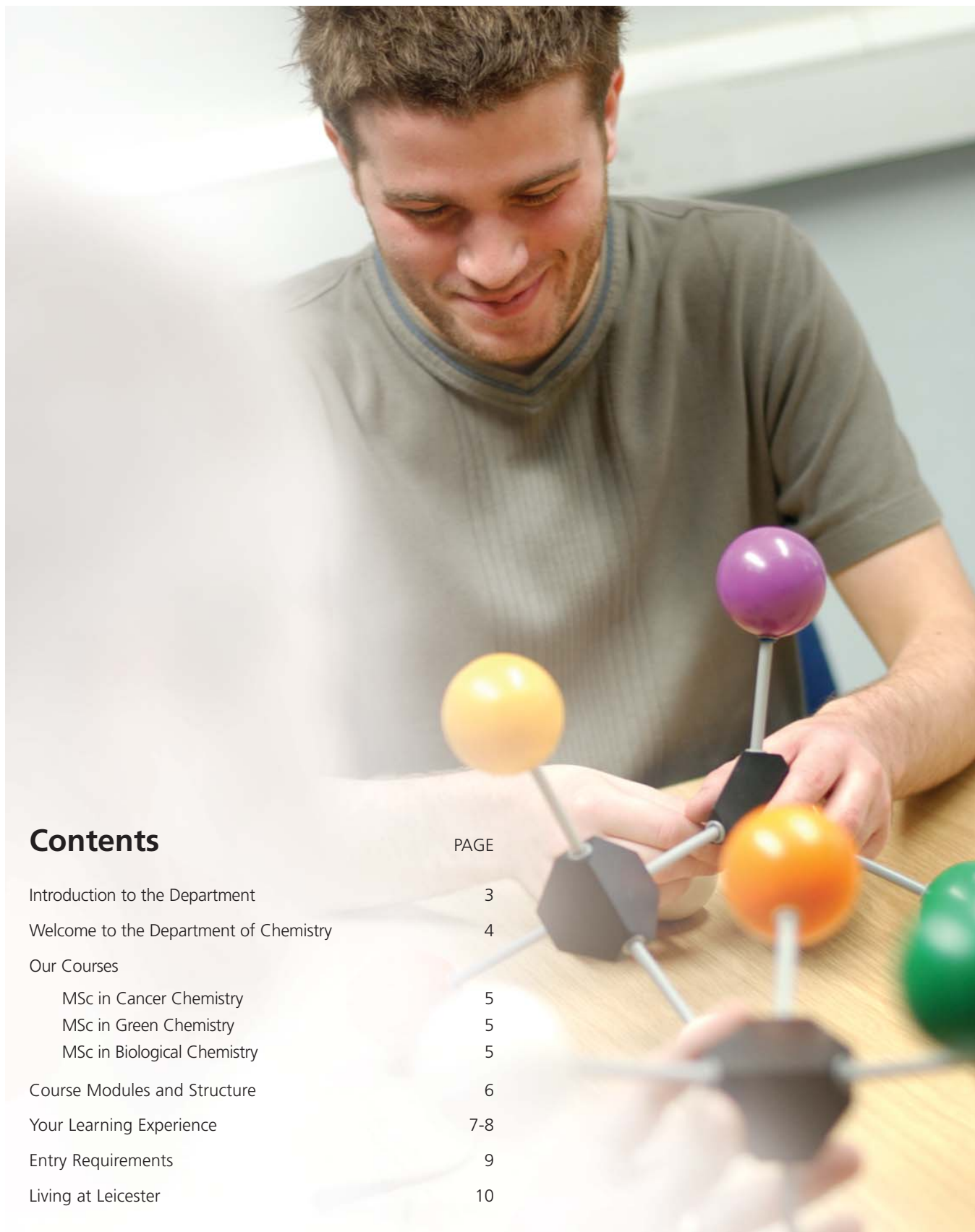
Chemistry



MSc Courses in

Biological Chemistry
Cancer Chemistry
Green Chemistry

www.le.ac.uk/chemistry/pgstudy.html



Contents

	PAGE
Introduction to the Department	3
Welcome to the Department of Chemistry	4
Our Courses	
MSc in Cancer Chemistry	5
MSc in Green Chemistry	5
MSc in Biological Chemistry	5
Course Modules and Structure	6
Your Learning Experience	7-8
Entry Requirements	9
Living at Leicester	10



Introduction from the Head of Department

The Department of Chemistry at the University of Leicester is a very vibrant and friendly place to study. We have state-of-the-art facilities and strong industrial and international collaborations ensuring that our research is cutting edge and addresses topical issues. The Department offers a wide range of challenging and rewarding postgraduate MSc courses that are designed to enhance and develop the scientific skills demanded by employers in industry or academia.

Chemistry, a key technology, is vital to the economy and the Chemical Industry accounts for over half the value of the UK's top 20 companies. These companies need graduates with knowledge, confidence and expertise who can adapt to the challenges and make the most of the opportunities that technological advances provide. Our courses are designed with these needs in mind.

Our MSc courses will provide training in up to date research methodologies and focus on important issues such as the causes of cancer and methods of producing materials in a sustainable manner. Our masters' graduates leave us with the knowledge and skills that will enable them to play leading roles in industry, business or in the world of academic research.

If, after reading the brochure, you need more information please do not hesitate to contact our admissions team at pgchem@le.ac.uk. I look forward to welcoming you to the Department.

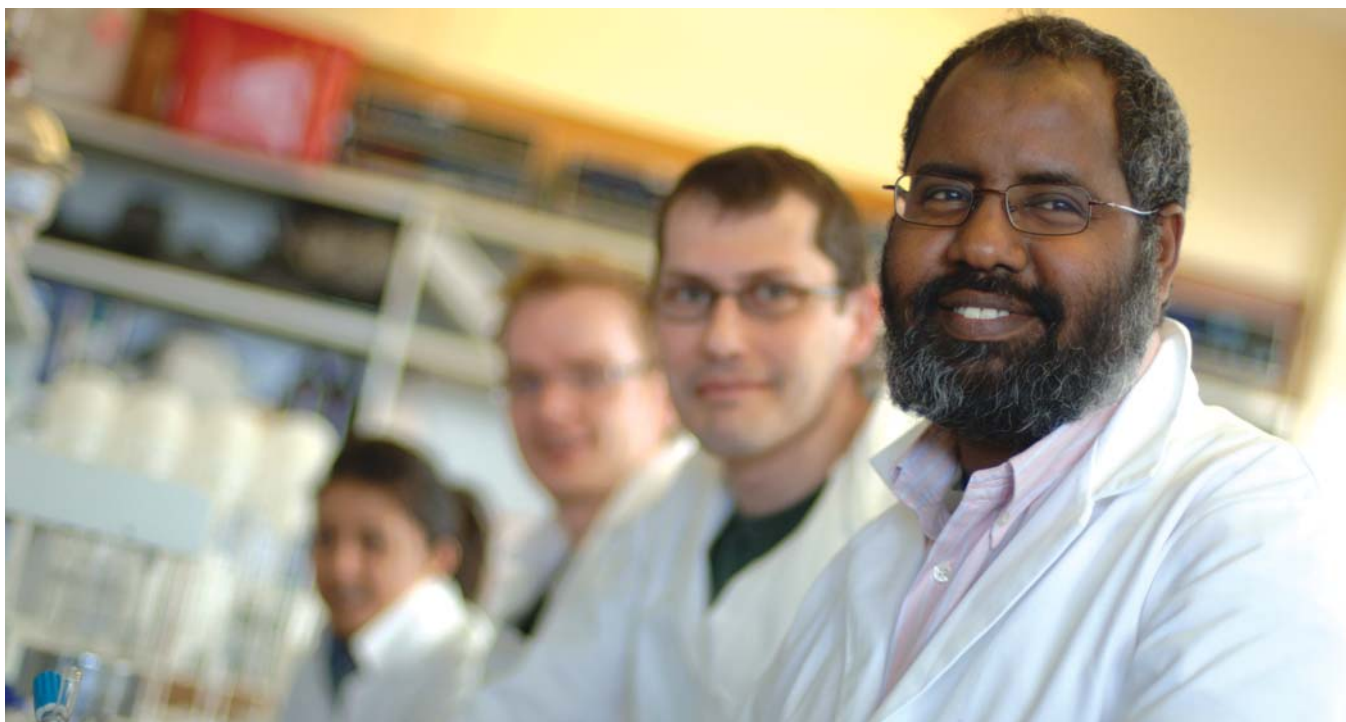
Professor Andrew Abbott
Head of Department

How to apply

Our application processes are designed to be user-friendly. Our staff are happy to advise if you have any queries about your application. You have the option of applying by post or online.

For postal applications, request the application package from the Postgraduate Admissions Office

University Road, Leicester, LE1 7RH
For online applications, please visit
<http://www.le.ac.uk/graduateoffice/pgprospectus>



“As a **BSc graduate** I found the MSc course a good stepping stone towards obtaining the required knowledge to effectively research for my PhD. The most enjoyable part of the course for me was the research project where I worked with a number of industrial companies such as Corus. The project involved using technology developed at the University of Leicester to recycle waste from the steel making industry to obtain valuable metals and reduce land-fill. The process that I developed was scaled up to pilot plant scale.”

Will Wise
MSc Green Chemistry (with industry)

Welcome to the Department of Chemistry

We are proud of our teaching and research in the Chemistry Department and we look forward to showing you around our facilities.

Why study chemistry at the University of Leicester?

- We are the **largest provider** of taught masters courses in the UK, meaning you will benefit from our skills and experience across a wide range of areas.
- Our unique, topical masters courses are designed to provide you with **training in cutting edge research themes** and you will be taught by those leading research in your area of interest, allowing you to benefit from developments as they occur.
- You will benefit from our **excellence in teaching, research and welfare provision**. We are fully aware of the specific needs of postgraduate students and ensure you are supported throughout your course.
- The Chemistry Department has consistently been **highly rated in University Guides** so you can be assured of our quality in teaching and research.
- We have a **range of modern flexible courses** designed to reflect your interests.
- You will benefit from our **refurbished teaching and research laboratories** and renovated lecture theatres.



Our courses

MSc in Cancer Chemistry

Our **MSc in Cancer Chemistry** provides training in the current concepts and techniques used in cancer chemistry research, including the chemical basis of carcinogenesis, design, synthesis and analysis of drugs and the molecular and genetic basis of cancer. It is designed to provide you with the skills to pursue a career in cancer chemistry research in the pharmaceutical industry, in biotechnology or to study for a PhD in the field of cancer research.

MSc in Green Chemistry

Our **MSc in Green Chemistry** explores modern approaches to chemical products and processes that reduce or eliminate the use and generation of hazardous substances including ways in which technologically important chemistry can be carried out without harm to the environment. It includes such concepts as waste minimisation and atom efficiency, solvent selection, and catalytic and energy efficient processes. It aims to develop your research, synthetic and analytical skills for a career in the chemical industry or further research leading to a PhD.

MSc in Biological Chemistry

Our **MSc in Biological Chemistry** explores the exciting science at the boundary between biology and chemistry and the ways in which the challenges of the worldwide pharmaceutical and biotechnology industries are being addressed. It develops your research, synthetic and analytical skills for a career in the global pharmaceutical industry or further research leading to a PhD.

“As I was interested in Organic Chemistry, **the MSc in Biological Chemistry** at Leicester seemed to be a natural choice. The excellent reputation of Leicester’s chemistry facilities and teaching confirmed this choice.”

Seelan Mariagnanendran
MSc Biological Chemistry

“ I completed my **BSc Chemistry** here in Leicester so I was already familiar with the University and Department. This was a big driving force for my choice of location for my postgraduate studies, I didn't want to have to get used to a whole new system. Between graduation from my BSc and starting my postgrad studies I was employed in a potable waters analytical laboratory. As this whetted my appetite for environmental considerations within chemistry I was attracted to the Green Chemistry course offered at Leicester. The course has given me an excellent grounding in the field of green chemistry and I really feel it will greatly improve my prospects of great career accomplishments in this field.”

Ian Hyde
MSc Green Chemistry

Course Modules and Structure

Our courses are split into three distinct parts; the first concentrates on research methodologies and runs from October to December, the second covers the specialisation of your course and runs from January to March while the final part focuses on the application of your specialisation in a research project.

All of our courses share some common components but each course has unique modules that focus on the current challenges in the topic.

Cancer Chemistry		Green/Biological Chemistry	
Introduction to Molecular Techniques	10	Characterisation Methods	20
Research Methods in Cell Biology	15	Synthetic Methods	20
Advanced Topics in Cancer Biology	10	Research Methodology I	20
Characterisation Methods	20		
Research Methodology I	20	Green Chemistry or Biological Chemistry	25
Cancer Chemistry	25	Extended Practical in Green or Biological	15
Research Methodology II	20	Research Methodology II	20
Research Project	60	Research Project	60

Research methodology

The research methodology modules provide you with experience in the techniques and skills that are important to carry out chemical research. The modules will develop your skills in planning, organisation, literature searching, practical laboratory skills, data analysis, report writing, oral presentation and team working.

Characterisation methods

Characterisation methods will consolidate your knowledge of the theory and understanding of modern spectroscopic and analytical procedures while the synthetic methods module provides you with an understanding of the key strategies involved in synthesising organic molecules.

Green and biological chemistry modules

The green and biological chemistry modules will make you aware of the new methodologies available in those areas and the environmental and social impacts.



Your Learning Experience

How will I be taught and assessed?

All of our masters courses are modular. All of our courses contain a number of lectures but these have different teaching styles depending on the course content. They are generally interactive and may contain web-based delivery and demonstrations.

All of our courses are linked to Blackboard – the University's online learning environment that gives you access to lecture notes, self-test exercises, supplementary information and background literature about the course.

Each module has its own assessment which can be tutorials, tests, essays, presentations or formal exams.

Will I undertake any research during my course?

One of the main elements of the course is the research project. This runs from March to August and gives you the opportunity to try out your newly learned research methodologies on a cutting edge project. You will work under the supervision of one member of academic staff. The research projects are assessed on various factors including effort, quality of results, the written report and an oral examination.

What research projects have other students undertaken?

Some examples of the wide range of research projects that MSc students have recently undertaken include:

Biological Chemistry

- Can cellular uptake of polyamines be exploited in drug delivery?
- Synthesis of novel calystegines – potential anti-diabetes, HIV and cancer agents
- Contrast agents for magnetic resonance imaging
- Biosynthesis and analogues of amphotericin B – Access to novel antifungal agents
- Understanding heme reactivity in heme peroxidases
- The mechanism of oxidation of tryptophan in biological systems

Cancer Chemistry

- Novel peptides that induce angiogenesis
- Synthesis of new analogues of curcumin
- Novel inhibitors of casein kinase
- New enzymes that halogenate tryptophan

Green Chemistry

- Recycling of metals from industrial waste using ionic liquids
- Novel solvent systems for metal deposition
- Ring-opening polymerisation for the production of biodegradable polymers
- Electronic tuning of dizinc initiators for ring-opening polymerisation
- The opportunity exists to carry out research in industry for part of your project in either biological or green chemistry.

For more details of the research activities in the department please visit our website <http://www.le.ac.uk/chemistry/>

“I wanted to study for my **MSc in Cancer Chemistry** at Leicester because it was the only course in the country that does pure Cancer Chemistry. I had taken some time out after gaining my BSc in Medicinal Chemistry, and this course is the best route for me to take to get into industry and do cancer research.”

Helen Lewis
MSc Cancer Chemistry

What specialist facilities and equipment does the Department have?

The Department of Chemistry's staff and research programmes place it at the leading edge of scientific research. The Department has consistently attracted a good level of financial support from all the major research councils (EPSRC, BBSRC, NERC, CLRC) as well as other sources (including the EU, DTI, Leverhulme, BP, ICI, Glaxo Wellcome, British Gas, AstraZeneca, CRUK and Medical Research Council) and, in recent years, this has increased significantly.

The Chemistry Department was recently refurbished, at a cost of £2.2 million, and now has more than 150 new fume hoods distributed throughout the research school. Research in the Department is supported by state-of-the-art equipment including Bruker, DPX 300 and DRX 400 and 500 MHz high field NMR spectrometers and access to 500 and 600 MHz instruments in the Biological NMR Unit. The Department houses both a Kratos Concept mass spectrometer (which includes EI, CI, FAB, GC/MS, electrospray and accurate mass), and a triple Quadrupole Mass Spectrometer with electrospray and APCI facilities, which allows open access sample analysis. X-Ray structure determinations are routinely carried out on a Bruker APEX 2000 diffractometer with low temperature attachment, and the Department has established links with the synchrotron and central laser facilities at Daresbury and the Rutherford Laboratory. The Department has a new DI nanoscope 300 state-of-the-art multimode AFM. In addition, there are EPR facilities (Jeol RE1X X-band and Bruker Elexsys 500). The Department is also served with a wide range of research grade equipment and spectrometers.

What computing facilities does the Department have?

In-house chemistry computing facilities include a dedicated computer suite (25 computers) and associated reading room, and molecular graphics facilities. All computers are networked and the Department has access to the University's supercomputer facilities through the centre for Mathematical Modelling. The department has its own glassblowing, electrical and mechanical workshops, for customised design of specialist equipment. There is a good collection of all the mainstream chemistry journals and reference books in the library in the Chemistry Department.

What library facilities will I be able to use?

The main University David Wilson Library has further chemistry journals and the main collection of science abstracts, books and periodicals. There is an online catalogue of the full library collection and an online Chemical Abstracts database search facility.

The main library contains a dedicated postgraduate area accommodating 200-250 people which includes a computer suite with 50 networked PCs, a quiet study area, group study areas and a relaxed seating area.

Entry Requirements, Course Fees and How to Apply

Entry Qualifications

- A degree with FIRST or SECOND CLASS HONOURS in Chemistry (with some knowledge of biochemistry for the biological and cancer chemistry degrees) awarded by a British University. Applications from candidates with equivalent qualifications from non-UK universities are also welcome.
- Applications without the formal qualifications indicated but with significant relevant experience may also be considered.
- Overseas students will be required to demonstrate their level of proficiency in the English language.

Course Fees (2008-2009)

- UK and European Union students: £3,240 pa.
- Overseas students: £12,100 pa.
- Suitable applicants for MSc Cancer Chemistry may be eligible to apply for one of the Cancer Research UK bursaries.

Application procedure

- To avoid disappointment, applicants are advised to apply as early as possible.
- For an information pack and application form, go to <https://wads.le.ac.uk/marketing/enquiry.aspx>





Living at Leicester

About the City of Leicester

Leicester is a lively, multi-cultural city. Its population is nearly 300,000 making it the tenth largest city in England. Leicester has a huge choice of pubs, clubs, restaurants, cinemas and theatres as well as excellent shopping – from one of Europe's oldest markets to the new Highcross Leicester development which will include a 12 screen cinema, restaurants, cafes and apartments.

Enjoy top class sport at the Leicester Tigers ground at Welford Road (rugby union), at the Walkers Stadium (football) and at Grace Road (cricket).

Take a trip to another galaxy without leaving the planet at the National Space Centre. Get in amongst the buzz of the lively, covered market that has a 700-year history. See one of the largest pieces of Roman architecture in Britain at the Jewry Wall Museum and travel back to the Middle Ages at Leicester's haunted medieval Guildhall. See contemporary works and a display of printmaking techniques at the City Gallery. Visit the natural history museum at New Walk, and also see the largest collection of German Expressionist art in the country. The shimmering saris and fabulous silks found along Belgrave Road are works of art in themselves.

The range of cafés and restaurants in Leicester is extensive; but Leicester's greatest culinary strength is South Asian food – exciting thalis, Indian sweets and delicious fresh samosas are just some of the cuisine on offer. For something altogether more lavish, dine in style on a steam train at the Great Central Railway. As a popular film location, this is a magnet for Hollywood stars including Nicole Kidman and Kate Winslet.

Leicester is in the heart of England with excellent communications by road, air and rail.

As Britain's first Environment City, Leicester is engaged in a programme of sustainable development to make it a green and pleasant place. It also enjoys some fine countryside within easy reach of the City.

About the University

Education that inspires. Research that changes the world.

The University of Leicester is a leading UK University with a proud past and an exciting future. We deliver high quality undergraduate, postgraduate and professional education and create research that has impact internationally.

Our research changes the world. According to Thomson Scientific, Leicester has the tenth highest number of highly cited researchers amongst the UK's universities. The discovery of DNA Genetic Fingerprinting is our most famous research achievement, but our world class research stretches across the arts, science and engineering, medicine, law, education, biological sciences and social sciences.

The University has the joint highest scores for overall student satisfaction in England amongst mainstream universities (National Student Survey). Leicester's student completion rate is amongst the very highest.

www.le.ac.uk/chemistry/pgstudy.html



Contact Details:

The MSc Admissions Team
Department of Chemistry
University of Leicester
Leicester LE1 7RH

e: pgchem@le.ac.uk

t: +44 (0)116 252 2100

f: +44 (0)116 252 3789

w: www.le.ac.uk/chemistry/pgstudy.html



University of
Leicester

© University of Leicester 06/08
Leicester LE1 7RH
UK

www.le.ac.uk