In October 2012, I began as Head of the then brand new Department of Chemistry here at Lancaster. Our first undergraduate students started in October 2013, and as I write this, they have just completed their first end-of-year exams. I am immensely proud of the hard work, time and effort our staff and students have put in to develop Chemistry at Lancaster in such a short time, into a vibrant, modern and collegiate Department.

Part of what attracted me to Lancaster was the opportunity to shape a new Department at one of the UK’s leading Universities. Lancaster University, currently celebrating its 50th year, has a well-deserved reputation as an inclusive, friendly and safe environment in which to live, study and work. It is also committed to maintaining its position as a centre for excellence in teaching and research.

Another attraction was the chance to develop a modern chemistry curriculum, designed to inspire a new generation of chemistry students with cutting-edge knowledge, taught in small classes by a team of world-class academic staff whose research is addressing many of the major challenges we will face over the coming century.

Our Chemistry Department is located at the heart of the 360 acre Lancaster campus; an ambitious £18 million building project is currently underway to provide us with new, custom-designed facilities to support our teaching and research.

I look forward to meeting you at one of our open days, where you will be able to tour our facilities, meet out staff and current students, and where you can get a taste of Lancaster life for yourself.

Professor Peter Fielden, Head of Chemistry
Why Chemistry? Why Lancaster?

Chemists have been instrumental in developing our modern world; expanding food sources through fertilisers; powering our lives with batteries, fuels and electricity; building structures and devices of ever increasing complexity from specialised materials; curing disease with advanced pharmaceuticals; and enabling us to explore and inhabit space.

Chemistry is a fundamental part of our daily lives, and increasingly we shape our world by understanding and controlling chemical processes. Moreover, many of the biggest challenges we will face as a society over this century will only be solved by advances in chemistry research.

Chemistry at Lancaster is well-placed to contribute, with an energetic team of academic, technical and administrative staff who are working to develop a modern chemistry department competitive with the very best the UK has to offer.

As we publish this, we are a little over half way through our currently planned staff recruitment. Between October 2012 and October 2013, we recruited 10 new academic staff, and we have just been through another successful round of recruitment. We will shortly be welcoming more academic, technical and administrative support staff to our Department.

By the end of 2014, the next phase of our £18 million building project will be completed, and will provide us with new, custom-designed laboratories to support our teaching.

The University’s investment in Chemistry is also enabling us to equip our new laboratories with advanced instrumentation and equipment, both for research and to support our practical chemistry teaching.

The Faculty of Science and Technology, where Chemistry is the newest department, is also seeing significant investment from the University, with a new Engineering Building due for completion by the end of 2014, and a major Physics refurbishment project planned for 2015.

Lancaster University itself is one of the highest rated universities in the UK, and has a growing international reputation for excellence.

One of only five college-based Universities in the UK, it is situated on a 360 acre parkland campus about three miles outside of the historic city of Lancaster.
Chemistry is a fundamental part of our daily lives, and increasingly we shape our world by understanding and controlling chemical processes.
We offer 3 year BSc and 4 year integrated Masters (MChem) Chemistry degrees, including an option to study at a North American university in the third year of the Masters degree.

Chemistry is a diverse discipline, encompassing many interconnected subjects. We have developed our new degree programmes to reflect this. Each of our single-honours Chemistry programmes shares a common first and second year, introducing many of the key concepts in chemistry, providing information on the breadth and diversity of chemistry, together with the links between the different topics.

For our BSc course, third year provides the opportunity to study more advanced areas of chemistry in greater detail, together with the chance to undertake a 10-week project in an area of modern chemistry research.

On our MChem study year in North America course, third year is spent studying at a prestigious North American university; your time spent at a North American university will count towards your degree here in Lancaster. Potential placements include the Universities of British Columbia and Western Ontario in Canada, and the Universities of Florida, Maine, Miami, and Illinois in the USA.

Our Lancaster-based MChem has a third year that involves studying advanced areas of chemistry in greater detail, together with research skills and techniques, and provides the opportunity to begin specialising in particular areas of chemistry.

Our MChem degrees share a common fourth year; the majority of fourth year is based around a major independent research project undertaken in our research laboratories, with taught courses offering the opportunity to further specialise in a particular area of advanced chemistry.

Chemistry can also be studied at Lancaster as part of an Environmental Chemistry degree, taught in conjunction with Lancaster Environment Centre. On these degrees, after first year you begin to specialise in areas of chemistry and environmental science which are complementary and interrelated. Research projects on these degrees are in environmental chemistry.

Lancaster also offers degrees in Biochemistry and Chemical Engineering, and the opportunity to study chemistry as part of the Natural Sciences degree programme.

Our Chemistry Degrees:
- BSc Chemistry (F100)
- MChem Chemistry (F101)
- MChem Chemistry/Study in North America (F1T7)

Our Environmental Chemistry Degrees:
- BSc Environmental Chemistry (F140)
- MChem Environmental Chemistry (F142)
- MChem Environmental Chemistry/Study Abroad (F143)
Teaching

We teach chemistry as an integrated subject, emphasising both the practical and theoretical skills that are becoming increasingly important for a modern chemistry graduate. The development of transferrable skills is also a key part of our degree programmes, so you are well-prepared for life after your degree.

Research in the chemical sciences typically spans the classical Inorganic, Organic and Physical (IOP) chemistry boundaries. For example, a modern synthetic chemist may make an organic molecule, use it as a ligand in a metal complex, characterise the properties of the complex using spectroscopic techniques, and may use computational chemistry methods to rationalise its behaviour.

Our approach to teaching also rejects these historical divisions. We prefer the categories synthesis and characterisation; measurement and analysis; and theory and computation.

Integrated within all areas of our teaching are practical and theoretical skills that are essential for a thorough understanding of chemistry, and which are so valued by employers. An average week in first year involves at least two afternoons of practical laboratory-based sessions, and at least six chemistry lectures.

In Lancaster, the academic year is divided into three 10 week terms, Michaelmas, Lent and Summer. Our taught courses comprise five or ten week modules, and typically three modules run in parallel, structured so that labs and lectures on a given topic run during the same period.

In first year, modules run for the first two-and-a-half terms. From second year onwards, the majority of the teaching is during the first two terms. Many of our modules also have end-of-year exams, which take place in the third term.

All of our modules involve some form of continual assessment, or coursework, and may take the form of weekly problems sheets, practical write-ups, mini-reports etc.

From the 2014/15 academic year, our practical teaching will take place in our brand-new, custom-designed synthetic, physical and computational teaching laboratories.
The first year of our Chemistry degree involves studying two-thirds chemistry, together with one-third free choice (timetable-permitting) from the options offered by other departments across the University. Common choices include Physics, Biology, Environmental Sciences, Maths and Psychology.

Each third of the first year at Lancaster is known as a theme. The first of the Chemistry themes contains five modules related to chemical synthesis; this includes courses on the structure and bonding of molecules, and organic and inorganic chemistry.

The second of the two themes contains modules on physical and analytical chemistry, together with our preparatory Maths courses, which are designed to introduce the relevant mathematical material needed for the degree.

These two themes combine to provide you with a broad introduction to degree-level chemistry, and will ensure that you have the foundation knowledge you will need to go on to study more advanced topics in later years of the chemistry degree, irrespective of your pre-Lancaster background.

In addition to the teaching associated with the specific themes, we also offer additional small group tutorials that seek to give students additional insight into university-level chemistry, through exposing them to the ideas behind our research at an early stage.
Second Year

The second year of our Chemistry degrees builds upon the strong foundations of first year, where we introduce a range of new topics, and go into greater depth with more familiar topics.

The structure of second year is a little different from first year, and is based around studying three Chemistry modules at any one time, for the first two terms. All of our chemistry modules have been designed to encourage the development of problem solving, communication, practical, research and technical skills. We also offer a transferrable skills and employability module, which seeks to provide our students with explicit practice in many of these skills in a broader context.

As in first year, associated with each module are lectures, practical classes (either synthetic, physical or computational), and a combination of seminars, tutorials and workshops. It is also during second year that the small class sizes we offer really becomes an advantage, as it affords our staff more time per student than many of our competitor institutions.

The chemistry modules you will study include:
- chemistry of π-systems
- strategies for chemical synthesis
- analysis and determination of organic structure
- the physical principles of spectroscopy
- thermodynamics and statistical mechanics
- phase transfer and kinetics
- organometallics, catalysis and mechanism
- advanced coordination chemistry
- solids, surfaces and soft matter
- quantum chemistry, symmetry and group theory
Third and Fourth Year

The final years of our degree programmes allow an element of specialisation within your degree, and provide the opportunity for all students to undertake independent research projects in conjunction with one of our world-leading research groups.

The third year of our Chemistry degrees varies depending on your degree programme: BSc students undertake an independent research project, MChem North America students will be away studying at a North American university, and MChem students will have the opportunity to specialise.

Third year is roughly structured around a common first term, involving several core chemistry topics, introducing f-block chemistry, advanced techniques in synthesis and chemical biology, and computational chemistry, together with developing several familiar subjects in greater depth.

The second term provides the opportunity for BSc students to undertake an independent research project. All Lancaster-based students can choose from a number of advanced, optional modules, currently including modules on advanced techniques for analytical separations, the chemistry of biomedical imaging, and polymer chemistry.

Fourth year involves a major independent research project, that will run throughout the first two terms. For more information on the possible areas of research, see the research section of this prospectus.

The remainder of fourth year will consist of optional taught courses, from a wide selection offered by our research-active academic staff in their particular specialisms.

As we expand as a department, more options will become available in both third and fourth year, but choices are currently expected to include:

- organic catalysis
- materials design
- liquid crystals
- theoretical spectroscopy
- solid-state NMR
- energy materials
- biochemistry
- supramolecular chemistry
- advanced polymer chemistry
- advanced quantum chemistry
- advanced analytical and spectroscopic techniques
The Student Experience

We recognise the huge importance of our students and the major contribution that they bring to our Department. Students are at the heart of all of our activity here at Lancaster.

Lancaster offers an unparalleled experience for its students, which has led to its secure place as the most-highly regarded university in the North West of England:

- It is one of only five college-based universities in the UK
- It is a campus-based university, providing a safe, secure and friendly environment in which to live, study and work
- The University has excellent, modern facilities to support its students
- The University’s student charter clearly sets out what you can expect from the University, and what the University expects of its students

All members of the University are also members of the colleges. Each of the eight undergraduate colleges provides a different experience, but all are far more than just halls of residence; they are small communities, which provide pastoral support, and an active social life, with college bars, and sports teams.

Lancaster guarantees on-campus accommodation to all first-year students who make Lancaster their first choice. However, with over 7,500 bed-study rooms on campus, a large proportion of our students spend all three or four years resident on campus.

The campus is also home to the library (currently undergoing a £15 million refurbishment), the student learning zone, the Nuffield theatre, restaurants, coffee houses, shops and supermarkets, a recently opened £20 million sports centre, and houses the many departments within the University, including the new Chemistry building, due for completion in summer 2015.
Chemistry has several advantages over other departments in the UK; we benefit from small class sizes (our expected intake for 2015/16 is around 45 students—long-term we expect to reach 60 students per year), and excellent staff-to-student ratios, as our staff numbers are growing alongside our student numbers.

We also have the advantage of offering a new, modern curriculum, where chemistry is taught as an integrated subject, with an emphasis on developing both chemistry-specific and transferrable skills. Our staff excel in teaching and in research, so you will be taught by world-leaders in their respective fields. From late 2014, our teaching will also take place in brand-new, custom-designed teaching laboratories.

Our degree programmes are flexible; on our single-honours chemistry courses you are able to study a second subject as a ‘minor’ in first year, and you can switch between the BSc and MChem courses (subject to internal grade requirements at the end of each year) at any point before the end of second year.

The Department is also establishing itself as a centre for research excellence, and as a vibrant, friendly environment in which to study and learn.
Research in Chemistry

Chemistry at Lancaster is growing into a modern centre for chemistry research. Our academic staff have a strong background in both fundamental and contemporary research of technological relevance, and seek to address many of the major challenges we face.

Our academic staff have moved to Lancaster to continue their successful research careers begun at other leading research-intensive universities across the UK and in Europe. They are keen to develop Chemistry at Lancaster into a world-renowned centre for chemistry research, but equally one built around the values we share as a Department.

Our approach to research mirrors that of our degree programmes and courses; create a vibrant, collegiate atmosphere to foster creativity and excellence in research.

Modern research that seeks to address the major challenges we face as a global community is inherently a collaborative effort, so in addition to our chemistry-specific research, we are developing research programmes that cross the standard discipline boundaries, and indeed the interfaces with the other natural sciences, including biology, engineering, environmental science, medicine, mathematics and physics, and that engage with government and industry.

Research within chemistry at Lancaster is roughly structured around three core themes
- Synthetic Chemistry;
- Analytical Chemistry and Spectroscopy;
- Chemical Theory and Computation;
which collect together academic research groups with similar fundamental skills and interests.

Research across our three themes is supported by the significant investment in Chemistry by the University; the first of our new, custom-designed research labs and instrument suites were completed at the end of 2013. Major new synthetic, physical and computational research laboratories, together with further instrument suites to house our growing collection of state-of-the-art equipment and instrumentation, will open over the next year.

We actively collaborate across research themes, and with experts in the wider University, in other universities, and in industry and government, to strengthen and widen our research and its potential applications.
In the final year of your degree, you will have the opportunity to undertake a piece of original research within the research group of one of our academic members of staff.

You will be able to choose from research projects offered by our growing number of academic staff. The following information will give you an idea of the type of research our current staff are interested in. Any of our staff would be happy to answer any questions you may have about their specific research interests; please see our website for more details and contact information.

Synthetic Chemistry

Our synthesis research section is the largest in the Department, and brings together research groups with expertise in molecule and material synthesis, design and characterisation, such as bioimaging; organic synthesis; catalysis; polymers; liquid crystals; and supramolecular chemistry.

Analytical Chemistry and Spectroscopy

This section collects our research groups with particular expertise in the chemical and physical properties of molecules and materials, such as solid-state NMR; spectroscopy of biological systems; electrochemistry and microfluidics; energy and photovoltaics.

Chemical Theory and Computation

The chemical theory and computation research groups have expertise in molecular simulation, molecular assembly and phase transitions in solids and soft matter; quantum chemistry and theoretical spectroscopy; materials modelling and property simulation.
The Department

Chemistry at Lancaster was founded in late 2012, with the intention of creating a world-renowned centre for excellence in chemistry teaching and research.

As a Department we have large ambitions; to develop into a world-leading centre for chemistry, with an inclusive, friendly and collegiate atmosphere.

To support our goals, the University has invested £26 million to develop the Chemistry Department. This investment is shared between staff recruitment, purchasing an extensive array of cutting-edge instrumentation and equipment, and our major building programme, an £18 million redevelopment to provide us with new, custom-designed spaces to support cutting-edge teaching and research activities.

The next phase, due to open by the end of 2014, will provide teaching facilities including a new 60-person synthetic laboratory with thirty fumehoods and a new 60-person physical laboratory supporting a variety of modern spectroscopic and analytical instrumentation; two smaller computational laboratories, and a number of instrument rooms to house more specialised equipment will follow in 2015.

To supplement our existing research facilities, including our solution-state NMR suite and general research laboratory, new synthetic, physical and computational research laboratories will open by summer 2015, together with solid-state NMR, mass spectrometry and X-ray diffraction suites, housing an impressive array of new instrumentation.

The building programme will also provide office space to house our growing numbers of staff, and communal and study areas for use by chemistry students.

Since 2012, the Department has grown to its current size of (as of June 2014) 12 members of academic staff, 4 technical staff and 3 administrative staff. Our planned recruitment will have another five members of academic staff in place by the end of 2014, and more beyond.

We also have a growing number of post-graduate students and research associates.

Each year we are growing our undergraduate intake; our planned undergraduate recruitment for 2015/16 entry is around 45 students.
The University has invested £26 million into the Chemistry Department including purchasing an extensive array of cutting-edge instrumentation and equipment.
Despite the amazing success of chemistry, there are many challenges that remain. Amongst many others, we need to develop new energy sources, make better use of our energy supplies by creating energy efficient lighting, transport and materials, more powerful batteries, biodegradable plastics, industrial processes that are less damaging to the environment, more efficient fertilisers, and pharmaceuticals for the treatment of disease.

By studying chemistry, you will learn how to address such fundamental challenges, and you will be taught creative problem-solving skills that will enable you to find unique ways of solving them. In the future, you may be responsible for changing the world in your own way, by solving one of these problems, or even by solving new problems that no one has recognised yet.

Our research directly links to applications in the following areas:

- biological imaging
- organic light-emitting devices
- lab on a chip
- solar cells
- biodegradable plastics
- pharmaceuticals
- purification techniques

We already have research links with industry, in terms of consultancy and direct collaborative/partnership projects. We are keen to expand our links to encompass our undergraduate courses.

Careers

Chemistry degrees open up a wealth of career opportunities, and are highly valued by employers across the public and private sectors. Many graduates will further their education by taking higher degrees (e.g., MSc/ MPhil/ PhD).
Some likely areas of chemistry related graduate employment are:

- all areas of chemical industry, ranging from multinational oil, chemical and pharmaceutical companies, to a host of smaller enterprises producing new and specialised products
- public health and environmental protection
- research in universities, government institutions, industry and private agencies
- teaching
- patent agencies
- scientific journalism
- forensic science
- postgraduate medicine

Graduates can also seek employment in a wide range of non-chemistry related industries, due to the many valuable transferable skills that are developed by a degree in Chemistry – for example, numeracy, data analysis, computing, practical skills, critical evaluation and presentation of both written and verbal reports. Such skills are highly valued by employers and are required in many areas of managerial and administrative work, in business, commerce, finance, banking or the Civil Service. Chemists have moved easily into occupations in all of these areas.
Key Information

These pages contain key information about how to apply to study chemistry at Lancaster, our courses and degree programmes, and some important facts about our Department.

Admissions
All applications to study on our degree schemes here at Lancaster must be completed through UCAS, the UK Universities and Colleges Admissions Service (see ucas.com for more details).

For the 2015/16 admissions round, applications must be received by UCAS by the 15th January 2015.

All UCAS applicants will be invited to visit us for a day to explore where you might be spending the next three or four years. More information on visiting us here at Lancaster is available at the end of this prospectus.

Degree Programmes

BSc or MChem
If you are uncertain whether you want to study for three or four years, bear in mind it is possible to switch between the BSc and MChem at any point during your first two years of study at Lancaster. However, this is subject to internal progression requirements; you must obtain an upper second class mark overall in your studies to be allowed to stay on the MChem.

North America
Should you be interested in the MChem North America degree, it is best if you apply directly for that degree. We cannot guarantee a place unless you apply directly for that programme. Again, this course is subject to higher internal progression requirements than our other degrees. You are free to switch to a Lancaster-based degree at any time.

Environmental Chemistry
A number of our applicants have applied for both the Chemistry and Environmental Chemistry degrees; you need only apply to one. You are free to switch between each of these programmes once you arrive in Lancaster.

Entry Requirements

A-level
A-level Chemistry is a required subject for all of our courses. We also typically require an A-level in a second science subject (preferably biology, mathematics or physics). The third A-level can be in any subject.

For our BSc degrees, our typical offer is ABB with an A in chemistry. For the MChem and the F1T7 MChem North America degrees, the typical offer is higher.

Details of our standard offers for non-A-level routes can be found on our website.

Maths
Many chemistry students are surprised by the maths content of degree-level chemistry. To prepare our students for this, all our programmes include introductory mathematics courses to cover this material. We therefore do not require A-level Maths (or equivalent), although it is useful if you have studied maths to that level.

We do however require a good grade in GCSE Maths (or equivalent).
Finance
Lancaster University’s priority is to support every student to make the most of their life and education. As part of this, Lancaster University has committed £3.7 million in scholarships and bursaries to help with your fees and living costs. Our financial support depends on your circumstances and how well you do in your A levels (or equivalent academic qualifications) before starting study with us.

For more details, and for general information about fees and funding, see the website: Lancaster.ac.uk/study/undergraduate/fees-and-funding/

Accommodation
Lancaster University guarantees on-campus accommodation to all first-year students who make Lancaster their first choice. However, with over 7,500 bed-study rooms on campus, a very large proportion of our students spend all three or four years resident on campus.

Our Residences Office can offer you a wide range of campus and off-campus accommodation managed by the University or the Students’ Union, making it easy to choose the right type of accommodation for you, whatever your needs and budget. Much more information is available from the accommodation web site: Lancaster.ac.uk/sbs/accommodation

General Information
League table position
Lancaster University is consistently rated as one of the best Universities in the UK: placed 10th in the 2015 Guardian league table and 11th in the 2015 Complete University Guide. Lancaster is the best-rated university in the North-West of England, well ahead of our neighbours.

Chemistry does not yet appear in any of the subject-specific league tables. This simply reflects the fact that we are a relatively new department. We are already working towards completing and excelling in all of the relevant criteria.

Royal Society of Chemistry Accreditation
We are currently working towards Royal Society of Chemistry accreditation with the view of achieving this status by 2017. If successful, this accreditation will apply to both the BSc students who graduate in 2016, and the MChem cohort who graduate in 2017 (the first of our students to graduate on the 4 year course).

The structure of the degree is being developed with the criteria for accreditation in mind, and we are in discussion with the Royal Society of Chemistry over this.
If you are considering applying to Lancaster, we highly recommend that you come and visit us. You will have the opportunity to meet current staff and students, and to experience Lancaster life for yourself.

Lancaster University is situated on a 360 acre parkland site, about three miles from the centre of the historic city of Lancaster, around five miles from the coast, and within easy reach of The Forest of Bowland and the Lake District National Park.

The city of Lancaster is easily reached via the M6, and has a major station on the West Coast Mainline, served by trains between London Euston, via Birmingham, to Glasgow or Edinburgh, between Manchester and Scotland, and a variety of local services.

The campus is connected to Lancaster city centre by a frequent bus service, which takes between 10 and 15 minutes.

For more visitor information, see: Lancaster.ac.uk/opentoall

The Lancaster campus is home to our academic and support departments, colleges and student accommodation, together with the library, student learning zone, Nuffield theatre, sports centre with facilities for social and competitive sport, a supermarket, bank, travel agent, pharmacy, dentist, medical centre, hairdressing salon, and a variety of restaurants, bars and cafes.

More information about the campus can be found at: Lancaster.ac.uk/about-us

Post-Application Open Days

All UCAS applicants will be invited to visit us for a day to explore where you might be spending the next three or four years. We will show you the Department, the University and the colleges, and you will have the chance to meet with some of our current staff and students. The day will also involve lunch, and learning more practical information about the Department and the University. You will also have the opportunity to try out a practical chemistry experiment for yourself.

Pre-Application Visit Days

If you are considering applying to Lancaster, or just want to find out more about us, you could attend one of the University Visit Days. For more information, see: Lancaster.ac.uk/visit-us
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