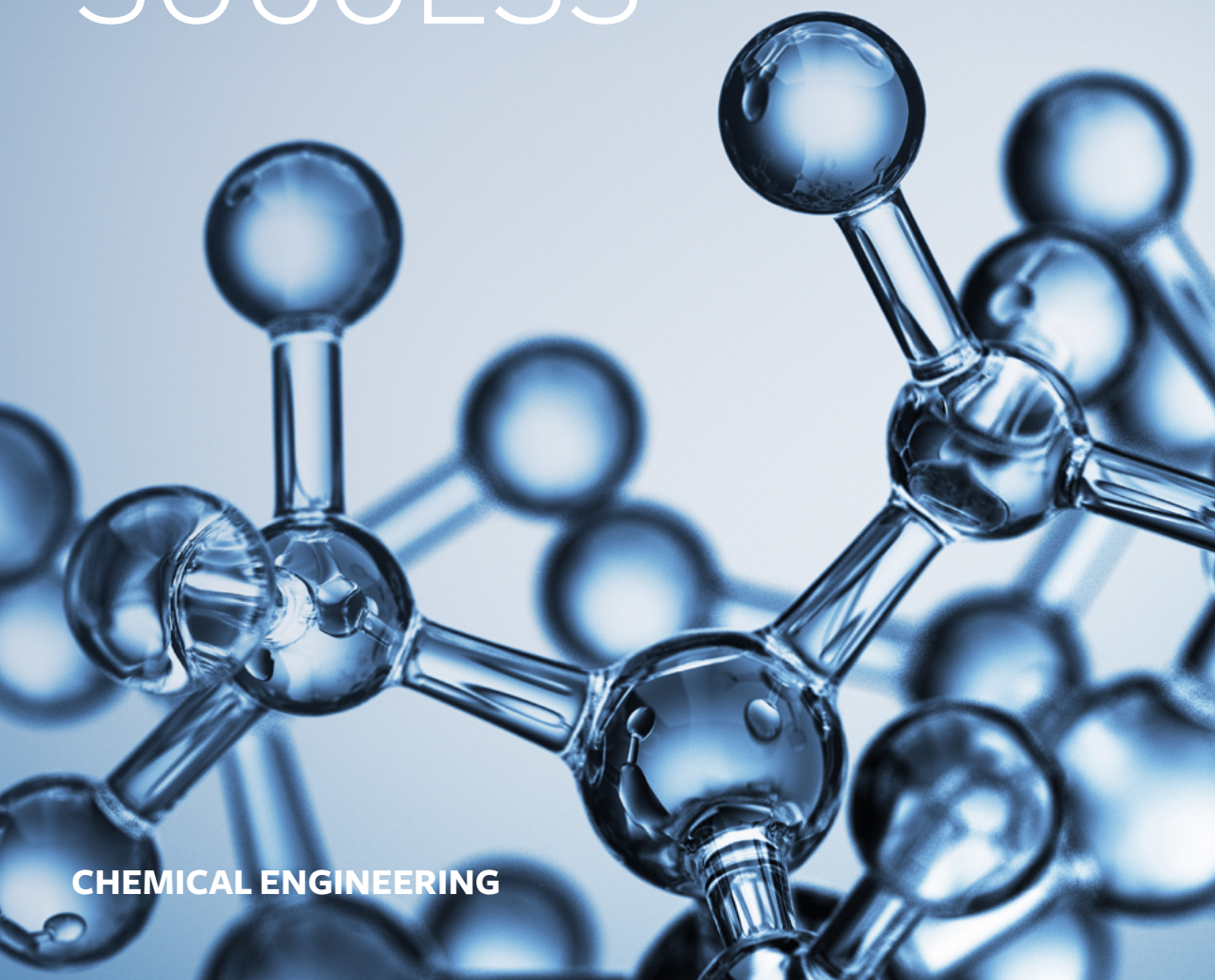
UNIVERSITY OF Southampton

SHAPE OUR SUCCESS



CHEMICAL ENGINEERING

FOREWORD

Thank you for your interest in the Department of Chemical Engineering.

The University of Southampton is a world-leading university, changing the world for the better by tackling global issues. A founding member of the Russell Group of universities, listed as one of the top 100 universities in the world, the University works extensively with industry, governments and research funders to the benefit of students, staff and society as it makes a global impact.

Building on the University's significant strengths in Engineering and Chemistry, the University Executive Board, chaired by the Vice-Chancellor, has committed to the ambitious development of a new Department of Chemical Engineering, which will sit within the Faculty of Engineering and Physical Sciences (FEPS).

We hope that you will join us in developing a first-class Department of Chemical Engineering that will compete on the international stage; delivering research-led education that attracts high achieving students with significant impact on a global scale.

Bashir M. Al-Hashimi CBE FREng FIEEE
Dean of Faculty, Engineering and Physical Sciences

INTRODUCTION

The University of Southampton is a world-leading, research-intensive university, with a strong and high quality educational offering, renowned for its innovation and enterprise.

It is a founding member of the Russell Group - an organisation of 24 top UK universities committed to maintaining the highest research and teaching standards. Southampton is ranked in the global top 100 universities in the QS World University Rankings and 20th in the UK's Complete University Guide 2020, with 15 of its subjects in the national top 10.

Southampton is ranked 8th in the UK for 'research intensity', according to Research Excellence Framework (REF) 2014, which assessed the quality of research in UK higher education institutions. The University is also a three-time winner of the Queen's Anniversary Prize, most recently for its expertise in photonics and fibre optic technology.

In 2018, the University was awarded Silver in the Teaching Excellence and Student Outcomes Framework (TEF) for its quality teaching and learning. Southampton is also a founding signatory of the Athena Swan Charter and holds a silver-level Athena SWAN award.

The University's mission is to change the world for the better. Central to the success of this strategy and underpinning all of the University's activities are four principles. These principles are: *Collegiality*, one team working, planning and delivering together, toward our shared vision; *Quality*, always striving to achieve the highest quality in everything we do; *Internationalisation*, delivering across global markets and building strong partnerships with other leading organisations; and *Sustainability*, ensuring our actions lead to financial, social and environmental sustainability.

The University's structure includes five faculties, where our academic and research activities take place: *Arts and Humanities, Engineering and Physical Sciences, Environmental and Life Sciences, Medicine* and *Social Sciences*.

FACULTY OF ENGINEERING AND PHYSICAL SCIENCES

The Faculty of Engineering and Physical Sciences includes:

- the School of Chemistry
- the School of Electronics and Computer Science
- the School of Engineering
- the School of Physics and Astronomy
- the Zepler Institute for Photonics and Nanoelectronics,

together with the research-led Web Science and Southampton Marine and Maritime Institutes.

The Faculty's specialist teaching and research laboratories and testing facilities, including one of the world's leading cleanroom complexes, are spread across the university's Highfield and Boldrewood Innovation Campuses. The Faculty is home to over 4,000 undergraduate students, over 600 postgraduate taught students, 1,030 postgraduate research students and over 880 education, research and enterprise staff. This represents an annual research income of around £60 million.

School of Chemistry

The School of Chemistry has a very strong research reputation and a vibrant community. It was ranked 8th in the UK for research power in REF2014, and 6th for research intensity. It has a large Graduate School with around 200 PG students (MSc and PhD) and ~50 Post-Doctoral Research Assistants, supported by funding from a diverse range of sources including the Research Councils, the EU, ERC, charities and industry.

Chemistry is located on the Highfield Campus to the north of Southampton and academic staff are organised under several research theme areas: Chemical Biology, Diagnostics & Therapeutics, Computational Systems, Electrochemistry, Functional Inorganic, Materials & Supramolecular Chemistry, Magnetic Resonance and Organic Chemistry: Synthesis, Catalysis and Flow, as well as two cross-cutting sections, Education and Characterisation and Analytics, that support work across the School.

Staff collaborate strongly with academic groups across the whole Faculty (Physics & Astronomy, Engineering Sciences, Electronics & Computer Science, Zepler Institute) and the wider University (e.g. the Institute for Life Sciences, Medicine, Biological Sciences, Ocean and Earth Sciences), as well as both nationally and internationally. Research strengths in Chemistry include, electrochemistry and electrodeposition, functional inorganic and porous materials, organic and inorganic synthesis, flow processing and catalysis, including carbon capture and utilisation, development and applications of computational modelling of chemical systems on a range of length scales, along with world-leading activities in the development and applications of magnetic resonance techniques.

Research in the School of Chemistry has led to several spin-out companies, including Ilika plc, Karus Therapeutics and ATDBio. In 2010 Ilika plc, a company set up to exploit novel methods for high throughput materials discovery, floated on the Alternative Investment Market (AIM) of the London Stock Exchange and continues to be highly successful.

The School of Chemistry has hosted the UK National Crystallography Service for over 20 years and boasts some of the world's leading lab-based experimental X-ray diffraction facilities. The University's outstanding track record both in Electrochemistry and in the School of Engineering have led to Southampton becoming a founding member of the Faraday Institution, a key part of the UK's Industry Strategy, set up with the aim of positioning the UK at the forefront of electrochemical energy storage science and technology.

The University, through the School of Chemistry, is also a partner in the Knowledge Centre for Materials Chemistry (hosted by the CPI), whose mission is to accelerate the development and translation of innovative solutions through partnership between industry and academia.

Chemistry is home to around 400 UG students registered for either 4 year MChem, 3 year BSc degree programmes. All of the BSc and MChem Undergraduate programmes are fully accredited by the Royal Society of Chemistry. The education programmes aim to challenge students and develop their knowledge and skills to tackle society's greatest challenges, and include opportunities for extended placements both in industry and in international academic institutions.

As part of its capital investments programme and 10 Year Plan, the University is undertaking a number of major building projects. This includes a significant investment (>£12M) in refurbishing Chemistry's Building 29, with a full upgrade of the specialist Undergraduate Chemistry teaching laboratories and experimental facilities, and including provision for practical training in Chemical Engineering.

School of Engineering

The School of Engineering represents the largest and most diverse engineering grouping in the UK, with expertise that looks deep below the Earth's crust, reaches into space, and encompasses everything in between. It was ranked first in the UK for research power in General Engineering in the Research Excellence Framework (REF) assessment 2014.

The School includes the Departments of Aeronautical and Astronautical Engineering, Civil, Maritime and Environmental Engineering, Mechanical Engineering and the Institute of Sound and Vibration Research.

Civil Engineering and Mechanical Engineering at Southampton were ranked fourth and sixth respectively in the Guardian University Guide 2019. Aeronautical and Manufacturing Engineering, Civil Engineering and Mechanical Engineering were placed fourth, sixth and sixth respectively in the Complete University Guide 2019. The QS World University Rankings 2018 rated Mechanical, Aeronautical & Manufacturing Engineering at Southampton among the top 100 institutions around the globe.

The School of Engineering's scale was demonstrated in the REF 2014, when it returned 192 academic and senior research staff. In addition, the School has a large community of early career researcher staff and students, all supported by approximately 40 technical staff. The School's world-leading facilities include the soon to be open National Infrastructure Laboratory on Boldrewood Innovation Campus and Acoustic Chambers and Wind Tunnels on Highfield Campus. The Boldrewood Innovation Campus has been largely funded by grants and contracts outside the university, which is an indication of strong external confidence and esteem in the School's activities.

Research strengths include pioneering activities in the fields of autonomous vehicles, biomedical technologies, energy storage, infrastructure and resilience, manufacturing and materials, and space technology.

The School's teaching expertise is combined with a practical approach to offer students the best possible start to their career. All courses offer students the chance to put theory into practice at the School's state-of-the-art facilities, with many of the students' innovative engineering projects showcased at an annual Design Show. The School is home to approximately 1,850 undergraduates, 250 postgraduate taught and 400 postgraduate research students.

Taught programmes are variously accredited by Institute of Mechanical Engineers (IMechE), Institute of Marine Engineering, Science & Technology (IMarEst), Royal Institute of Naval Architects (RINA), Royal Aeronautical Society (RAeS) and Joint Board of Moderators (JBM – which includes the Institution of Civil Engineers and the Institution of Structural Engineering).

The School of Engineering contains a large and vibrant community of enterprise staff, providing consultancy and practical solutions to industry, locally, nationally and globally. Staff work closely with partners and tailor solutions to ensure that we provide the most beneficial service, enabling them to achieve their goals. It might be as simple as a day's consultancy or a longer-term joint research project.

The School's six enterprise units include the Wolfson Unit for Marine Technology and Industrial Aerodynamics (WUMTIA), working on ship design and industrial aerodynamics, and Institute for Sound and Vibration Research consulting, working on noise and vibration measurement/control in buildings, public spaces, workplaces.

Equality

The Schools of Chemistry and Engineering at Southampton are fully committed to the Athena SWAN Charter that recognises a commitment to addressing gender inequalities. Our involvement in the Athena SWAN project is to improve career progression for female academics in science, engineering and technology disciplines in higher education and research in Southampton. The project aims to tackle an uneven representation of women in science and as a result achieve a significant increase in the number of women recruited to top posts.

Chemistry and Engineering at Southampton have been awarded Silver and Bronze Athena SWAN awards, respectively, in April 2015 and again in April 2018 in recognition of their continued efforts to support the career aspirations of female chemists and engineers.

DEPARTMENT OF CHEMICAL ENGINEERING

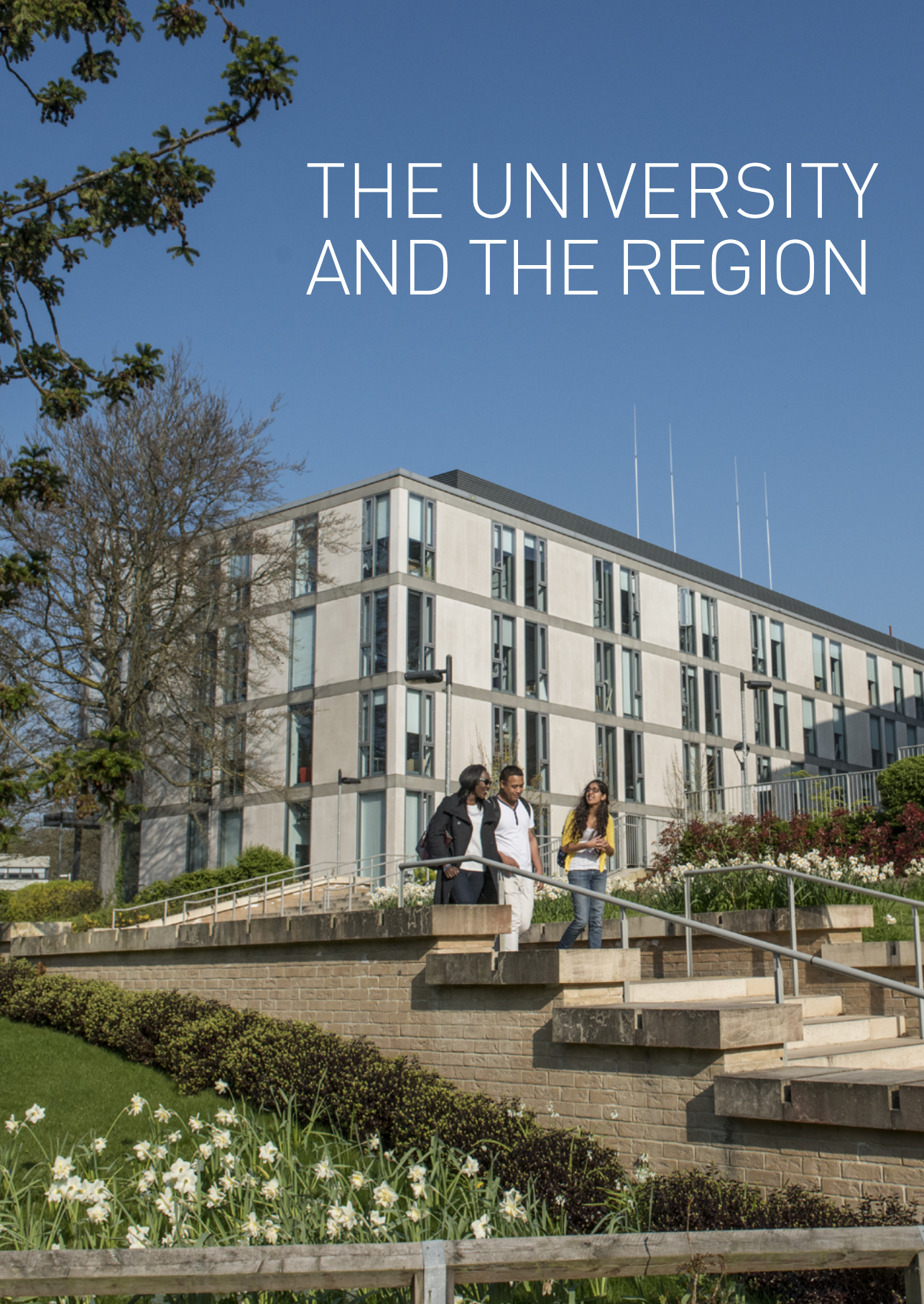
The University Executive Board is committed to creating a Department of Chemical Engineering, which will sit within the Faculty of Engineering and Physical Sciences (FEPS) and complement the strengths and reputation of both Chemistry and Engineering in the University.

The Chemical Engineering Board, chaired by the Dean, has developed a business plan to achieve this, and the appointment of staff with significant expertise in education and research in Chemical Engineering represents a key step in delivering the vision and ambition for establishing Chemical Engineering as a high performing and successful discipline in the University.

There is a strong commitment to making further staff appointments as the programmes are developed. The refurbishment of the teaching laboratories in Chemistry also includes the provision of facilities and infrastructure for elements of the Chemical Engineering practical training and plans are being developed towards a dedicated Chemical Engineering laboratory.

The University will welcome its first cohort of MSc students in autumn 2019 on the Advanced Chemical Engineering programme and an Undergraduate MEng programme is currently in the design phase, in discussion with IChemE from whom accreditation will be sought. The programmes will build on the strengths of both Schools, especially low-carbon approaches to energy and waste and the production of high-value chemicals, with scope to develop other areas of specialisation.

THE UNIVERSITY AND THE REGION



Our main Highfield Campus is home to state-of-the-art teaching and research facilities, as well as two of the UK's leading arts venues, Nuffield Southampton Theatres and Turner Sims Southampton.

The University campuses

The University has seven lively and diverse campuses: Highfield, Avenue, Boldrewood and Waterfront in Southampton; Winchester; Malaysia; and Southampton General Hospital,.

Highfield Campus is home to state-of-the-art teaching and research facilities, as well as three of the UK's leading arts venues, the John Hansard Gallery, the Nuffield Theatre and Turner Sims Southampton – one of the UK's leading music venues. It also houses our sports complex, the Hartley Library, the Students' Union and Staff Social Centre.

The Avenue Campus houses most of the humanities disciplines and the Centre for Language Study. It also has a purpose built £3 million archaeology building with state-of-the-art facilities for teaching and research.

The University's collaboration with Lloyd's Register, Boldrewood Innovation Campus, represents one of the largest business partnerships with any single university in the world. This new £124 million campus is the result of this partnership and is home to the Southampton Marine and Maritime Institute.

Situated on the City's waterfront, the National Oceanography Centre Southampton (NOCS) is one of the world's leading research centres for the study of ocean and Earth science.

Close to Winchester city centre, 12 miles north of Southampton, our internationally renowned Winchester School of Art provides studios and workshops, an extensive specialist library and a well-stocked art supplies shop. The Winchester Gallery is based on campus.

Southampton

Southampton is a thriving modern city, steeped in history and culture, while less than an hour away, the New Forest National Park offers vast open heathland and beautiful forest. In 2016, it was rated by The Guardian as one of the top ten happiest cities to work in the UK.

A lively city

The City offers a vibrant mix of recreation, culture and entertainment – from restaurants, cafés, bars and nightclubs to cinemas, sports facilities and internationally acclaimed arts venues. Close to the city centre, the University forms an integral part of this dynamic, multicultural city.

A growing city

The City is benefiting from substantial, ongoing investment with £1.6 billion committed and a further £1.4 billion planned in the next ten years. Facilities include: the new £40 million cultural quarter scheduled for completion in 2016, £90 million of investment in West Quay and a £400 million redevelopment of the Royal Pier Waterfront which sees over 400 cruise ship visits a year. The University is worth over £1 billion-a-year to the regional economy and is a key part in ensuring Southampton's thriving future.

A coastal location

Southampton has one of the biggest commercial ports in Europe, and the City is known across the world as the home of the prestigious cruise liners, Queen Elizabeth, Queen Mary 2 and Queen Victoria. With a coastal location, there is a vast range of opportunities for sport and leisure, with a major focus on water sports, sailing and ocean racing.

A gateway to the world

Just over an hour from central London, Southampton has excellent transport links with the rest of the UK and internationally, by road, rail, sea and air. Our award-winning unilink bus service connects all Southampton campuses and halls of residence, the city centre, the airport and railway stations.

Winchester

The historic city of Winchester has a rich cultural heritage, complemented by a lively atmosphere and a wide variety of pubs and restaurants, museums, theatres and galleries.

See for yourself what the University and surrounding area has to offer:

View our virtual tours

Watch our video