There has never been a better time to undertake a career path in chemical engineering. In the 21st century, mankind faces great challenges in providing sustainable supplies of energy, in protecting our environment, supplying clean water and adequate food for all and in developing benign processes for the chemical and pharmaceutical industries. These urgent problems can only be solved by applying novel technology developed from a solid foundation of fundamental knowledge, which is itself created through a multidisciplinary yet focussed approach. At the heart of the solution is chemical engineering, which through the development of processes and technologies can benefit society as a whole. Many of the products and services which are used every day by you have had input from chemical engineers, from the food and drink sectors, waste management, energy, plastics and the pharmaceutical and fine chemical industries.

Industry plays a key part in the degree courses we offer with numerous placement opportunities available to our students, as well as careers advice from practising chemical engineers to help to guide your choice of career pathway. We have a strong reputation for producing very high quality graduates who have made a significant impact during their careers and we welcome you to be part of this proud tradition and the family of chemical engineering alumni from Manchester.
A range of scholarships and bursaries are available for students who choose to study chemical engineering at The University of Manchester. Several industrial scholarships are available once you have started the course. Further details are available from: http://man.ac.uk/KN9DUq or, on request from our admissions team. For international students, our School will award up to ten Morton Scholarships for International Excellence, worth up to £4,000 (£1,000 per year of the course), for those international students who demonstrate overall academic excellence.

The University’s Faculty of Science and Engineering also offers scholarships of £2,000 per year for well-qualified international undergraduate students.

Research Excellence Framework (REF), 90% of our research was described as ‘world leading’ or ‘internationally excellent’

In the most recent teaching quality assessment by the Higher Education Funding Council for England, we achieved an excellent Z2 out of 24, one of the highest scores awarded in the country. We have close links with industry and our distinguished reputation means that our alumni are very well regarded. Our graduates are the most sought after by employers in industry.

As the birthplace of the discipline of chemical engineering, we have a long tradition of innovation and excellence. Here, George E Davis delivered the first series of lectures on the subject in 1887 and published the first-ever chemical engineering text book. Our current academic staff are at the forefront of chemical engineering teaching and research and are authors of key chemical engineering texts.

Why study with us

Our students consistently tell us that our School of Chemical Engineering and Analytical Science is a very friendly place to study. We have around 900 undergraduate students, plus a thriving postgraduate community, all of whom benefit from our distinguished reputation and our high standards of teaching and research.

Facts

- A step towards a career in chemical engineering—rated as the second highest paid graduate job in a survey by The Times newspaper.
- Distinguished history in chemical engineering as the birthplace of the subject as an academic discipline.
- Reputation as a world leader in industrially relevant research and teaching in chemical engineering and related subjects.
- Range of prestigious scholarships, open to all nationalities, which reflects the popularity of our graduates with industry.

Funding

A range of scholarships and bursaries are available for students who choose to study chemical engineering at The University of Manchester. Several industrial scholarships are available once you have started the course. Further details are available from: http://man.ac.uk/KN9DUq or, on request from our admissions team. For international students, our School will award up to ten Morton Scholarships for International Excellence, worth up to £4,000 (£1,000 per year of the course), for those international students who demonstrate overall academic excellence.

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Facilities

We recently moved to a brand new, £12 million teaching building. This building houses state-of-the-art computer clusters, an undergraduate teaching laboratory, a bespoke enquiry-based-learning suite and a new pilot hall designed for chemical engineering in the 21st century. Benefits of our pilot scale laboratory include: in-house industrial experience as part of the course; an enhanced understanding of chemical engineering theory; practical experience of safety issues and hands-on practical insight into start-up and shutdown principles. We also have several smaller-scale teaching laboratories, where you learn how to plan and undertake experiments, evaluate and operate laboratory equipment, appreciate the importance of safety requirements and analyse experimental data using graphical and statistical methods.

IT

You will have access to computer clusters across the campus and in halls of residence, as well as more than 180 computers in our School dedicated to chemical engineering students.

Library

You will use our University Library, one of the largest academic libraries in Britain, with more than four million books and journals. This includes general and specialist materials, as well as a variety of electronic resources.
What is Chemical Engineering?

Chemical engineering is sometimes also called “process” or “manufacturing” engineering and is concerned with designing processes to carry out molecular transformations at large scale, in order to provide the products and materials we all need.

Chemical engineers take raw materials and, through understanding of the underlying engineering and scientific principles, turn them into useful products via chemical or biological reactions. The main challenge chemical engineers overcome is carrying out a process developed by a chemist in a laboratory at industrial scale. Without Chemical Engineers, we wouldn’t have chocolate, painkillers, plastics, antibiotics, paper, ink, detergents, petrol, paint, or toothpaste.

Chemical Engineers are widely employed by major manufacturing companies and are among the highest paid of the different engineering professions. Working in industry, chemical engineers manufacture essential products and generate profit for companies by adding value to raw materials and biological processes using mathematical equations, as well as learning about and getting hands-on experience of using the equipment and techniques applied in industry for large-scale manufacturing. At Manchester, safety and sustainability are also studied in depth. You will develop skills that will be of great use to you in your future career, such as team-working, problem-solving, communication and the use of information technology.

What will I learn?

The technical aspects of chemical engineering revolve around managing the behaviour of materials and chemical reactions. This means predicting and manipulating compositions, flows, temperatures and pressures of solids, liquids and gases. You will discover how to understand and describe chemical, physical, and biological processes using mathematical equations, as well as learning about and getting hands-on experience of using the equipment and techniques applied in industry for large-scale manufacturing. At Manchester, safety and sustainability are also studied in depth. You will develop skills that will be of great use to you in your future career, such as team-working, problem-solving, communication and the use of information technology.

Course details

<table>
<thead>
<tr>
<th>Degree courses</th>
<th>UCAS Code</th>
<th>Duration</th>
<th>Entry requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEng Chemical Engineering</td>
<td>H800</td>
<td>3 years</td>
<td>AAA 37</td>
</tr>
<tr>
<td>MEng Chemical Engineering</td>
<td>H801</td>
<td>4 years</td>
<td>AAA 37</td>
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<tr>
<td>MEng Chemical Engineering with Energy and Environment</td>
<td>H8F4</td>
<td>4 years</td>
<td>AAA 37</td>
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<tr>
<td>MEng Chemical Engineering with Study in Europe</td>
<td>H810</td>
<td>4 years</td>
<td>AAA 37</td>
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<tr>
<td>MEng Chemical Engineering with Industrial Experience</td>
<td>H803</td>
<td>4 years</td>
<td>A*AA 38</td>
</tr>
</tbody>
</table>

For detailed course specific entry requirements see our website.

How does chemical engineering compare to chemistry?

Chemists design chemical reaction routes to produce desirable products or processes, working on a molecular level. Chemical Engineers then find ways to put these into practice in a cost-effective and safe way on an industrial scale, using real equipment to move, mix, react, heat up, cool down and separate materials.

How does this relate to subjects studied at school?

In physics and mathematics courses at school you will have learned basic heat-transfer (eg, conduction, convection and radiation) and calculations of motion and momentum. From chemistry classes you have probably carried out process operations—such as distillation and filtration—on a small scale.

For more information about chemical engineering, see the Institution of Chemical Engineers website: www.whynotchemeng.com
IChemE accreditation
All our chemical engineering courses are accredited by the IChemE. After gaining appropriate industrial experience, graduates may apply for corporate membership and gain professional recognition as a Chartered Engineer (CEng), with average earnings of £15,000 more per year than their non-chartered colleagues.

Athena SWAN
The Athena SWAN Charter recognises and celebrates commitment to advancing gender equality in academia.
What’s a better place to study chemical engineering than at the birthplace of chemical engineering itself? Laboratory sessions, great lecturers, group problem based learning sessions and a variety of societies to be part of at the university will mould you into a hardworking engineer. This will give you enough skills and experiences to be utilised to solve real life problems.

Choosing to study MEng Chemical Engineering at Manchester has got to be one of the best choices I have ever made in my life. During my first year here, I started off vaguely understanding what the course entails and what my future role would be in the university, but now I am crystal clear of what a career in engineering would entail and found that my own interest in engineering strengthened. To sum it up, I am proud to call myself a student of The University of Manchester.

The chemical engineering course has provided an amazing opportunity to gain valuable technical skills that I am using during my industrial placement. The logical problem solving approach to teaching has developed my knowledge and interest in all engineering industries. The course structure provides a good development, through team project tasks to independent work which is invaluable to any career.

In my opinion, Manchester nurtures you not only to develop the key academic skills that will form the foundations on which to build your professional career but also to develop the so-called soft skills that will allow you to become leaders and managers of the future. The impressive thing about the strategy embedded into the teaching in Manchester is that it does not feel overwhelming at all to obtain these skills.

Nilukshan Ananthathavam

Daniel Niblett

Khor Eugene

Rameez Mussa
**What our lecturers say**

**Prof Aline Miller**
Professor in Biomolecular Engineering

Aline is currently a Professor within the School and teaches the second year students.

While in Manchester she has gained several awards including the Exxon Mobil Teaching Fellowship in 2004 and in 2008, won The Royal Society of Chemistry MacroGroup UK Young Researchers Medal, and also The Institute of Physics, Polymer Physics Group Young Researchers Lecture Award for her work on self-assembling materials. More recently she won the 2014 Philip Leverhulme Prize for Engineering and was shortlisted for the 2014 WISE Research Award. Aline is currently Director of Research for the School and Gender Equality Champion for the University.

My research interests lie at the life-science interface with emphasis on applying physical principles to mimic, manipulate and improve biomolecular self-assembly. Inspiration for this work comes from nature as it has had many millennia to optimise the production of highly-functional structures with 100% efficiency. Excitingly some of this work is now being commericialised through PeptiGelDesign Ltd which I co-founded in 2014.

**Dr James Winterburn**
Lecturer in Chemical Engineering

James obtained his undergraduate degree in Engineering Science from the University of Oxford in 2007 and then moved to Manchester, to study for his PhD which he obtained in 2011. He has been in the School ever since, having worked as a postdoctoral researcher for two years prior to starting his lectureship in 2013. James is the CEAS Admissions Tutor and has taught chemical engineering design in semester one of the first year of the undergraduate degree course.

I work in the area of industrial biotechnology with a focus on the production of everyday chemicals, such as polymers and surfactants via an alternative route using microorganisms, looking to reduce our dependence on crude oil as a raw material.

From a teaching perspective I particularly enjoy teaching the first year students, giving them their first introduction to chemical engineering and assisting them with the transition to being independent learners.

**Dr Thomas Vetter**
Lecturer in Chemical Engineering

Thomas obtained his undergraduate degrees, a BSc in chemical engineering in 2007 and an MSc in Chemical and Bioengineering in 2008, from ETH Zurich, Switzerland. He followed this up with a PhD in process engineering, which he obtained in 2012. After a postdoctoral stay at UC Santa Barbara and Eli Lilly and Company, he commenced his lectureship in Chemical Engineering at The University of Manchester in September 2014. Thomas holds a Royal Academy of Engineering Research Fellowship and is the Industrial Experience Course Leader.

My research is focused on processes that produce particles of high value products, such as crystals of pharmaceuticals, with desirable properties. Apart from high product purity, the shape and size of these particulates is often decisive for their successful application in a product. Processes that achieve these desirable properties while expending a minimum of resources (minimum use of solvents, low energy costs, short times) in a robust fashion are devised in my research group.

Within my teaching activities, I particularly enjoy teaching the fundamentals of particle science, which links well to my research, as well as supervising groups during the intensive third year design project. In the design project, students combine the knowledge they obtained in previous years and creatively apply it to the overall design of a process, which is truly exciting to watch and support. As the course leader of our industrial experience programme, I enjoy interacting with students on their industrial placements and assisting them with their academic commitments throughout their year in industry.

**Dr Li Sun**
Lecturer (teaching focused)

Li has been in the School since October 2009, having worked as a postdoctoral researcher prior to becoming a teaching focused Lecturer in August 2015. Before joining CEAS Li worked as an Associate Professor at Dalian University of Technology in China, having obtained her PhD in Chemical Engineering from there in 2004.

Li has teaching and research experience from working in both the UK and China. Her research areas of expertise lie in process systems integration and sustainable site utility system optimisation to achieve process productivity improvements in the chemical industry, energy sector, etc.

In her teaching Li gives lectures to chemical engineering and petroleum engineering undergraduates covering topics linked to her research expertise such as heat transfer, distillation, and materials for drilling engineering. Li especially enjoys using blended teaching methods, supervising dissertation research projects, and tutoring her undergraduate tutees.
Take a tour of our School and find out more about student life from the people who know best - our students.

www.ceas.manchester.ac.uk/study/virtual-open-day

Virtual Open Day

What our alumni say

Kirsty Donovan
Sellafield Ltd, Process Engineer

Manchester prepared me for a challenging career in nuclear decommissioning. The proactive learning style I developed whilst studying Chemical Engineering has benefited me when pursuing opportunities in my career. There is also an international recognition of the standard of Manchester Chemical Engineering Graduates that has given me a good base to build on.

Shobana Simon
Shell, Process Engineer

The course is a perfect blend of lectures, coursework, design projects and exams and enhances one's problem-solving skills. Manchester also gives you the opportunity to work with students from all over the world. This prepared me for my current role where collaboration is key to successfully delivering various projects in a multinational company.

Luke Glynn
AkzoNobel, Integrated Supply Chain

The year spent in industry was particularly useful as the challenge of balancing both the academic requirements and the professional workload sets you up well for career in industry post-graduation.

The approach to learning and problem solving that is instilled in students at Manchester is invaluable in adapting to new challenges.

Chemical Engineering

Academic Life

Our chemical engineering students are taught in a variety of different ways, from lectures in large groups to small group tutorials. Office hours for each of your classes give you a chance to meet with your lecturers on an individual basis.

Watch the video 2 min
The University of Manchester

School of Chemical Engineering and Analytical Science

Student Recruitment and Admissions, Sackville Street Building, Sackville Street, Manchester, M13 9PL

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manchester.ac.uk/ceas
ChemEngManUni

This leaflet was printed on June 2017 for the purposes of the 2018 intake. It has therefore been printed in advance of course starting dates. For this reason, information contained within this publication for example, about campus life, may be amended prior to you applying for a place on a course of study. Course entry requirements are listed for the purposes of the 2018 intake only.

Prospective students are therefore reminded that they are responsible for ensuring, prior to applying to study on a course of study at the University of Manchester, that they review up-to-date course information including checking entry requirements, which is available by visiting http://www.manchester.ac.uk/study/undergraduate/courses and searching for the relevant course.

Further information describing the teaching, examination, assessment and other educational services, offered by the University of Manchester is available from http://www.manchester.ac.uk/study/undergraduate.