Chemical Engineering with Process Control

MEng Honours

UCAS code H830
4 Years

www.ncl.ac.uk/ug/H830

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Control engineers apply engineering principles to design, build, and manage computer-based instrumentation and control systems used in the manufacturing industry.

These help monitor chemical engineering processes involved in producing a wide range of products, and give manufacturers a competitive edge.

This professionally accredited MEng Honours degree introduces you to the state-of-the-art in industrial modern control theory.

You will gain chemical engineering knowledge alongside specialist maths and computer skills needed for careers in modern control engineering.

Highlights of this degree

Quality and ranking
At Newcastle you’ll join a School of Engineering with a long-standing reputation for teaching quality and student support.

Professional accreditation

Accreditations

All of our degrees are accredited by:

- Institution of Chemical Engineers (IChemE)
- Institute of Measurement and Control

IChemE accreditation means employers will recognise the quality of your degree because it meets high professional standards.

BEng or MEng?

Both our BEng degree and specialist MEng degrees provide a pathway to becoming a Chartered Chemical Engineer. This is one of the most recognisable international engineering qualifications.

Our MEng degrees are a direct route to becoming a Chartered Engineer (CEng). You don’t need to study any more qualifications after your degree to work towards chartered status.

Our three-year BEng degree can also lead to Chartered Engineer status. However, you’ll need to complete further study, such as an approved Master’s degree.

Find out more

Find out more about the benefits of becoming a Chartered Engineer on the Engineering Council’s website.

Find out how to obtain Chartership through IChemE on IChemE’s Get Chartered website.

*All professional accreditations are reviewed regularly by their professional body.

What you will study

Flexible degree structure

All of our Chemical Engineering degrees (except our Industry degree) cover the same study programme for the first three years. This means that transfer between our degrees (except the Industry degree) is possible up to the end of Stage 3 should you find your interests change, providing you achieve the appropriate academic standard.

Transfer to or from our Industry degree is also possible up to the end of Stage 2, providing you achieve the appropriate academic standard.

Core curriculum (first three years)

We introduce you to core engineering, maths and science principles underpinning the design of a chemical engineering process plant.

You will learn everything from controlling chemical reaction rates to using specialist computer software to solve chemical and process engineering problems.

Study topics include:

- how to perform, measure, analyse and manipulate chemical reactions
- basic types of mass, heat and momentum transfer
- the design criteria for heat exchangers and other plant equipment used in process plants

In the third year you bring all this knowledge together to design a process plant in a team.

Fourth year (MEng only)

If you are studying an MEng degree, you take specialist modules in your fourth year - see the Course Details.

Boost your employability with a work placement

Apply to spend 9 to 12 months on an optional work placement between Stages 3 and 4. You can apply to spend your placement year with any organisation and will receive University support to do so.

You’ll gain first-hand experience of working in the sector, putting your learning into practice and developing your professional expertise.

It will extend your degree by a year and is subject to availability, however it isn’t available if you’re spending a year studying abroad.

Find out more about Work Placements.
Study abroad

In your final year you complete an individual design project and substantial research project.

With the agreement of the Degree Programme Director, you can carry out a research project at one of our partner universities in Europe or worldwide. Locations include Australia and Singapore.

Facilities and support

As a chemical engineering student at Newcastle, you will join our School of Engineering.

Facilities

Facilities include:
- a state-of-the-art BioLab, providing access to a range of small scale unit operations and the latest equipment
- a recently upgraded pilot plant laboratory
- modern bench-top experimental equipment
- an interactive video teaching system
- high-specification fume cupboards for handling volatile chemicals
- two dedicated computing suites, running specialised industry-standard computer software

Support

You’ll be supported by a personal tutor throughout your degree – an academic member of staff who can help with academic and personal issues.

You’ll also have access to a peer mentor in your first year – a fellow student who can help you settle in and answer any questions you have.

Defence Technical Undergraduate Scheme (DTUS)

Do you want to become a technical officer in the Royal Navy, British Army, RAF or Defence Engineering and Science Group when you graduate?

This degree is approved by the Defence Technical Undergraduate Scheme (DTUS).

DTUS is a sponsorship programme for students interested in a scientific, engineering or technical career in the armed forces or the Ministry of Defence.

Find out more on our Armed Forces page.

Course Details

Modules for 2018 entry

Please note

The module and/or programme information below is for 2018 entry. Our teaching is informed by research and modules change periodically to reflect developments in the discipline, the requirements of external bodies and partners, student feedback, or insufficient numbers of students interested (in an optional module). To find out more read our terms and conditions.

Module/programme information for 2019 entry will be published here as soon as it is available (end of May 2019).

Our degrees are divided into Stages. Each Stage lasts for an academic year and you need to complete modules totalling 120 credits by the end of each Stage. Further information, including the credit value of the module, is available in each of the module descriptions below.

Please be aware that programme modules do change and therefore may differ for your year of entry.

Stage 1

Compulsory modules

CME1020 Chemistry
CME1021 Thermodynamics
CME1023 Transfer Processes
CME1025 Principles of Chemical Engineering
CME1026 Computing and Numerical Methods
CME1027 Data Analysis in Process Industries
ENG1001 Engineering Mathematics I

Stage 2

Compulsory modules

CME2022 Separation Processes 1
CME2023 Transfer Processes 2
CME2024 Reactor Engineering
CME2027 Chemistry 2
CME2028 Thermodynamics 2
CME2029 Process Measurement, Dynamics and Control
CME2030 Chemical Engineering Laboratory I
CME2031 Safety, Risk and Engineering Practice
ENG2011 Engineering Mathematics II
Stage 3

Compulsory modules
- CME3008 Process Control 2
- CME3032 Process Design and Economics
- CME3033 Separation Processes 2
- CME3034 Design for Process Safety
- CME3035 Reactor Systems Engineering
- CME3036 Process and Product Engineering
- CME3039 Plant Design
- CME3040 Chemical Engineering Laboratory II

Work Placement (optional)
You can apply to spend 9 to 12 months on an optional work placement between Stages 3 and 4. You can apply to spend your placement year with any organisation and will receive University support to do so. It will extend your degree by a year and is subject to availability. It isn’t available if you’re spending a year studying abroad. Find out more on about Work Placements.

If you choose this option, you will take the following:
- NCL3000 Careers Service Placement Year Module

Stage 4

Compulsory modules
- CME8103 Process Control 3 - Design of Robust Control Algorithms
- CME8104 Process Control 4 - Design of Digital Control Algorithms
- CME8117 MEng Research Project
- CME8120 Advanced Design Project
- EEE8013 Linear Controller Design and State Space with Matlab Applications

Optional modules
You select 10 credits from the following modules:
- CME8038 Sustainable Industry
- CME8107 Process Intensification
- CME8119 Advanced Transport Processes
- CME8124 Multivariate Methods

Teaching and assessment

Industry-informed teaching
Newcastle students graduate fully equipped with the skills they will need thanks to our strong links with industry experts and focus on industry skills, including:
- problem-based learning for the first three years based around industrial case studies – excellent preparation for life as a professional engineer
- lectures delivered by practicing industry experts covering issues surrounding safety management and environmental protection
- industry representation on our Board of Studies with direct input into our degrees
- industry links with over 100 chemical engineering companies, resulting in sponsorship and placement opportunities and plant visits

Teaching methods
We use case-study-led teaching, so your learning has real-world relevance.

Teaching is through a combination of:
- lectures
- tutorials
- seminars
- computer practice sessions
- extensive practical laboratory work
- group work on case studies and design projects

Assessment methods
You’ll be assessed by a range of methods depending on the modules you study, including:
- class tests
- laboratory reports
- multi-choice questions
- project reports
- oral presentations
- closed book examinations
- interviews

Find out more
Visit our Teaching & Learning pages to read about the outstanding learning experience available to all students at Newcastle University

Entry Requirements

All candidates are considered on an individual basis.

If your qualifications are not listed here, please see our additional entry requirements web pages to find out which other qualifications are considered.

The entrance requirements below apply to 2019 entry.

Unconditional Offers 2019 Entry
We are keen to admit the brightest students onto our courses, regardless of background. In 2019 we will be making a number of unconditional offers across a range of subjects to students from the UK who demonstrate exceptional academic achievement. These offers will be made to students who we believe will make a substantial contribution to our student community, and who we really want to study with us.

If you receive an unconditional offer from us, this demonstrates our confidence that you have the necessary qualities to succeed in your exams at school or college and
to excel on your chosen degree. The unconditional offer will allow you to focus on your studies so that you can achieve excellent results.

The criteria for receiving an unconditional offer will vary across different subject areas. You will be identified for an unconditional offer on the basis of your overall academic profile which will include:

- a minimum GCSE achievement level
- a minimum A level (or IB) prediction threshold
- an excellent personal statement and reference

If you are made an unconditional offer this will be dependent upon on you choosing Newcastle University as your Firm choice. A conditional offer with the standard entry requirements for the degree will be made to you to at the same time, to provide you with maximum choice.

If you choose your unconditional offer as your Firm choice, it means that you have secured your place at Newcastle whatever you achieve in your final exams. We are confident that applicants who receive an unconditional offer will repay our confidence in them by continuing to work hard and achieve excellent grades.

**Advice on Maths and Science requirements**

If you don’t think you will have the exact Mathematics and Science qualifications referred to in our entry requirements by the time you need them, you may not be sure what to do. We hope that the following will help.

- If you already have, or are taking, the A level (or equivalent) Maths and Science qualifications specified in our entry requirements, you should apply for stage 1 (First Year) entry of the engineering degree course in which you are interested.
- If you have a Maths qualification but will not have it at A level (or equivalent) when you start your degree, you should apply for the relevant degree with Foundation Year. We may give you the opportunity to take the Newcastle University Pre-Entry Maths Course™ and the option to start in First Year if we think that this will be the best route for you.
- If you have A level Maths (or equivalent) already but not at the required grade, you should contact us for advice. We may decide that you could be considered for Foundation Year entry, or it may be that our engineering courses are not the best options for you.
- If you will not have the equivalent of an A level in the Science subject (if any) required, you should apply for the relevant degree with Foundation Year.

If you are still not sure, do not worry.

Whatever you apply for, our Admissions Tutors will help you decide which is the best route for you. They may therefore make you an offer for a different course (e.g. Foundation Year entry instead of First Year entry) from the one you apply for.

*The Newcastle University Pre-Entry Maths Course aims to provide the requisite mathematical skills and concepts needed on our engineering degree courses and to prepare students for the modes of learning they will encounter. The materials for the course are delivered electronically and include opportunities to practise your skills. You study the materials in your own time and, when you are ready, you book your exam with the Engineering School to which you have applied. A fee of £150 is payable at the time of booking the exam or shortly before the date set for examination.*

**A Levels**

A*A*A-AAA including Mathematics and Chemistry and at least one of Further Maths, Physics, IT or Biology but excluding General Studies and Critical Thinking. For Biology, Chemistry and Physics A levels, we require a pass in the practical element. GCSE Physics or Double Award Science (minimum Grade B or 6) required if Physics not offered at A level.

**Scottish Qualifications**

AAA at Advanced Higher including Mathematics and Chemistry. Grade B in Higher Physics required if not offered at Advanced Higher. Two Highers at the required grade (in different subjects to those offered at Advanced Higher) may replace a third Advanced Higher.

Scottish qualifications can be taken in more than one sitting.

**International Baccalaureate**

37 points with Mathematics and Chemistry at Higher Level grade 6 or above. Physics required at Standard Level grade 5 or above if not offered at Higher Level.

**Irish Leaving Certificate**

Candidates will normally only be considered for foundation year entry. All applications will be considered on an individual basis.

**Access Qualifications**

Access Qualification in relevant area of engineering or physical science. Must include 45 level 3 credits at Distinction including 30 credits in maths and chemistry. Grade B or 6 in GCSE Physics or Dual Award Science required if Physics not offered at a higher level.

**Pearson BTEC Level 3 National Extended Diploma/OCR Cambridge Technical Level 3 Extended Diploma**

Candidates will be considered for Foundation Year entry. Please see Engineering with Foundation Year for specific entrance requirements.

**Cambridge Pre-U**

D3,D3,D3 in Principal Subjects including Mathematics and Chemistry and at least one of Further Mathematics, Physics or Biology. GCSE Physics or Double Award Science (minimum Grade B or 6) required if Physics not offered at a higher level.
Extended Project Qualification
We welcome applications from students offering an Extended Project and value the skills of research and independent learning that it is designed to develop. If you offer an Extended Project, it will be taken into account as part of your application profile, but we will not usually include it in offer conditions for this degree programme.

PARTNERS - A Levels
ABB including Mathematics and Chemistry and at least one of Further Maths, Physics, IT or Biology but excluding General Studies and Critical Thinking. For Biology, Chemistry and Physics A levels, we require a pass in the practical element. GCSE Physics or Double Award Science (minimum Grade B or 6) required if Physics not offered at A Level.

The PARTNERS Programme is Newcastle University’s supported entry route for students from schools and colleges in England, Scotland and Northern Ireland. Find out more about the PARTNERS Programme.

PARTNERS - Pearson BTEC Level 3 National Extended Diploma/OCR Cambridge Technical Level 3 Extended Diploma
Candidates will be considered for Foundation Year entry. Please see Engineering with Foundation Year for specific entrance requirements.

The PARTNERS Programme is Newcastle University’s supported entry route for students from schools and colleges in England, Scotland and Northern Ireland. Find out more about the PARTNERS Programme.

Foundation Year
If you don’t have the right mathematics and/or science qualifications for direct entry, you can take a Chemical Engineering Foundation Year:

• Chemical Engineering with Foundation Year BEng Honours (H814)
• Chemical Engineering with Foundation Year MEng Honours (H816)

This will provide you with the knowledge you need to progress to one of our three- or four-year Chemical Engineering degrees.

English Language Requirements
Applicants whose first language is not English require a minimum score of IELTS 6.0 or equivalent including 5.5 in each of the four elements of the test.

If you need help to meet our English Language requirements, we can provide support with extra tuition.

Read more about UK visas and immigration requirements.

International Foundation Programmes
If you are an international student and you do not meet the academic and English language requirements specified above, you should consider a preparation course at INTO Newcastle University, which will help to prepare you for study on this degree course. INTO Newcastle University is based on the University campus and offers a range of courses including the International Foundation in Physical Sciences and Engineering.

Other International Qualifications
ABB at A level is typically the minimum required for entry to an undergraduate course. You can check the equivalent grades for qualifications offered in your country.

We will also consider your application if you have lower or non-standard qualifications.

Undergraduate Admissions Policy
See our 2018 Admissions Policy (PDF: 185 KB).

See further policies related to admission.

Careers
Chemical Engineering careers
Chemical engineers play a crucial role in many aspects of our everyday life. They are employed across a wide range of sectors helping with the management of resources, the protection of the environment and the control of health and safety procedures, while developing and managing the processes that make the products we desire or depend on.

Our graduates are targeted by prestigious and high profile organisations from sectors including pharmaceuticals, chemicals, energy, oil and gas, water, environment, biotechnology and food and drink.

International opportunities are available for experienced graduates with an interest in working outside the UK. Past graduates have built and run plants in the Far East, operated water treatment processes in the Gulf and developed catalysts in Chicago.

Chemical Engineering is a degree that is well respected in industry and commerce. The wide scope of the training and skills you receive in your degree studies is highly valued by many different organisations and opens up opportunities in careers ranging from ground breaking research and consultancy to business and management.

Our extensive network of industry contacts and strong partnership with the University Careers Service enables us to equip our students with the necessary skills and experience to secure challenging and rewarding graduate employment.
Find out more about the career options for Chemical Engineering from Prospects: The UK’s Official Careers Website.

For more information on careers in chemical engineering or industrial sponsorship, contact:

The Institution of Chemical Engineers
Telephone: 01788 578 214
Website: www.icheme.org

Royal Academy of Engineering
Telephone: 020 7222 2688
Website: www.raeng.org.uk/education

What our graduates go on to do: employment and further study choices

See what our recent graduates went on to do and view graduate destinations statistics. These statistics are based on what graduates were doing on a specific date, approximately six months after graduation. Take a look at the most recent data available for our graduates.

The destination data is available in varying levels, beginning with the University and moving through Faculty and School down to individual course reports. This final level may give you some useful ideas about possible options after your course or a course you are considering.

Careers and employability at Newcastle

Newcastle University consistently has one of the best records for graduate employment in the UK.

96% of our 2017 UK-domiciled UG/PG graduates progressed to employment or further study within six months of graduating.

85.5% of our graduates are in graduate level employment or further study within six months of graduating.

We provide an extensive range of opportunities to all students through an initiative called ncl+. This enables you to develop personal, employability and enterprise skills and to give you the edge in the employment market after you graduate.

Our award-winning Careers Service is one of the largest and best in the country, and we have strong links with employers.

Fees & Funding

Tuition Fees (UK students)

2019 entry:
£9,250

For programmes where you can spend a year on a work placement or studying abroad, you will receive a significant fee reduction for that year.

Some of our degrees involve additional costs which are not covered by your tuition fees.

Please note:
The maximum fee that we are permitted to charge for UK students is set by the UK government.

As a general principle, you should expect the tuition fee to increase in each subsequent academic year of your course, subject to government regulations on fee increases and in line with inflation, as measured by RPIX*. See more information on all aspects of student finance relating to Newcastle University.

*RPIX is a measure of inflation in the UK, equivalent to all the items in the Retail Price Index excluding mortgage interest payments.

Tuition Fees (EU students)

2019 entry:
£9,250

You will pay the same tuition fees as UK students for the duration of your course.

For programmes where you can spend a year on a work placement or studying abroad, you will receive a significant fee reduction for that year.

Some of our degrees involve additional costs which are not covered by your tuition fees.

Please note:
As a general principle, you should expect the tuition fee to increase in each subsequent academic year of your course, subject to government regulations on fee increases and in line with inflation, as measured by RPIX*. See more information on all aspects of student finance relating to Newcastle University.

*RPIX is a measure of inflation in the UK, equivalent to all the items in the Retail Price Index excluding mortgage interest payments.

Tuition Fees (International students)

2019 entry*:
£22,110

*Please note:
You will be charged tuition fees for each year of your degree programme (unless you are on a shorter exchange programme).

The tuition fee amount you will pay may increase slightly year on year as a result of inflation, as measured by RPIX**.

If you spend a year on placement or studying abroad as part of your degree you may pay a reduced fee for that year.

See more information on all aspects of student finance relating to Newcastle University.

*RPIX is a measure of inflation in the UK, equivalent to all the items in the Retail Price Index excluding mortgage interest payments.

**RPIX is a measure of inflation in the UK, equivalent to all the items in the Retail Price Index excluding mortgage interest payments.
Tuition Fees (International students)

*RPIX is a measure of inflation in the UK, equivalent to all the items in the Retail Price Index excluding mortgage interest payments.

Scholarships and Financial Support (UK students)

You may be eligible for one of a range of Newcastle University Scholarships in addition to government financial support.

Newcastle University Scholarships
Government financial support

Scholarships and Financial Support (EU students)

You may be eligible for one of a range of Newcastle University Scholarships in addition to government financial support.

Newcastle University Scholarships
Government financial support

Scholarships and Financial Support (International students)

We offer a range of scholarships to eligible international students:
Vice-Chancellor’s International Scholarships
Vice-Chancellor’s Excellence Scholarships
Vice-Chancellor’s Global Scholarships
We also offer International Family Discounts which are available for all international students with a close family member who has graduated from or is now studying at Newcastle University.
Some of our subject scholarships and sports scholarships are also available for international students.

UCAS buzzword

Ask your teacher or adviser from your school or college for the UCAS buzzword. You need the buzzword when you register on the Apply system. This makes it clear which school or college you are applying from.

All UK schools and colleges and a small number of EU and international establishments are registered with UCAS.

If you are applying independently, or are applying from a school or college which is not registered to manage applications, you will still use the Apply system. You will not need a buzzword.

Making your application

On the UCAS website you can also find out more about:
• application deadlines and other important dates
• offers and tracking your application

Application decisions and enquiries

Find out more about our admissions process and who to contact if you need help with your application.

Our tutors are on hand to support students.

Apply

Applying to Newcastle University through UCAS

To apply for undergraduate study at Newcastle you must use the online application system managed by the Universities and Colleges Admissions Service (UCAS).

UCAS codes for Newcastle University
• institution name - NEWC
• institution code - N21

Take a virtual tour at www.ncl.ac.uk/tour