Electrical Power Engineering with Industrial Project

MEng Honours

A world-class university in a world-famous city

UCAS code H622
4 years

www.ncl.ac.uk/ug/H622
Printed from the web page above on 22/06/2019
Electrical Power Engineering with Industrial Project

MEng Honours
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This four-year MEng degree in electrical power engineering integrates a year of Master’s-level study and an industrial placement.

Your first three years mirror those of our Electrical Power Engineering BEng degree. You study a common curriculum providing core electronic engineering skills, followed by specialist topics such as:

- electrical machines
- renewable energy
- power electronics

In the fourth year, you complete an industrial placement in the UK or abroad, helping you boost your CV and develop industry contacts. You’ll expand your skills in areas such as:

- the design of modern electrical machines and drives
- distributed control systems

You complete design projects to showcase your skills to future employers. For example, developing a solar tracking system.

Highlights of this degree

Professional accreditation*+

Our degrees are professionally accredited by the Institution of Engineering and Technology (IET) on behalf of the Engineering Council. This means future employers will recognise the quality of your degree because it meets high professional standards.

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

BEng or MEng?

Both our BEng and MEng degrees provide a pathway to becoming a Chartered Engineer (CEng). This is one of the most recognised international engineering qualifications. Our Master of Engineering (MEng) degrees are a direct route to becoming chartered. You don’t need to study any more qualifications after your degree to work towards chartered status.

Our three-year BEng degrees can also lead to Chartered Engineer status. This can be achieved through professional development or a Master’s degree.

Find out more

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

Quality and Ranking

- **top 10** in the UK for world-class research, with 90% of research classed as ‘world-leading’ or ‘internationally excellent’ – Research Excellence Framework 2014
- **top 175** – Engineering and Technology category – *Times Higher Education* World University Rankings by Subject 2018

What you will study

We cover core topics to enable you to understand the operation of simple electrical machines and electronic communications systems, such as:

- current flow in semiconductor devices
- electromagnetism
- digital electronics
- linear control theory

We complement this with teaching in how to analyse, design and construct electrical and electronic circuits to meet specific criteria.

We help you to develop your computing skills and engineering mathematics knowledge, with topics covering:

- extended C and assembly language programming techniques
- the design and testing of microprocessor systems
- the application of differential equations and linear algebra to describe complex engineering systems

You also take part in a series of group projects to develop your skills in soldering, wiring, circuit board construction and project planning such as a simple digital voltmeter, a power amplifier, a radio transmitter and receiver, and a mini-racing car that can find its own way round a track. You race the car and create a crowdfunding video on how the technology can be utilised in industry.

Industrial project

A major element of Stage 4 for MEng students is an industrial project.

This gives you valuable experience of:

- finding a job in a competitive market
- working on a real engineering project set by your host business
- developing your CV
- developing valuable industry contacts

Many students choose to do this at a local company, but you may undertake the project anywhere in the UK or in Europe.

Recent participating companies include:

- Tridonic
- Dyson
- Siemens
- Imagination Technologies

Recent projects have included:
- satellite electronic communication systems for mobile phones and navigation
- protocols for electronic drive control
- an electric bike
- underwater autonomous vehicle control
- connections for low carbon technology to the power grid

Flexible degree structure
We understand that you may not yet know which area of electrical and electronic engineering you want to specialise in.

We have designed our degrees so that all of our students study a common syllabus for the first two years. This gives you the chance to see where your interests lie.

It also means that you may transfer between any of our Electrical and Electronic Engineering degrees up to the end of the second year should your ideas change as your skills and knowledge develop.

Transfer from a BEng degree to a MEng degree is subject to you achieving the appropriate academic standard.

Sponsorship / DTUS

Company sponsorship
Our students are so sought after that many leading companies offer sponsorship and scholarships to our students (on a competitive basis) via the E3 Academy and UK Electronics Skills Foundation (UKESF).

We are one of only three university members of the E3 Academy, which provides scholarships and work experience placements to students of electrical engineering.

We are also a partner university in the UKESF, which also provides bursaries, work placements and mentoring.

Defence Technical Undergraduate Scheme (DTUS)
This degree is also approved by DTUS for entry to all technical corps.

DTUS is a Ministry of Defence sponsorship programme for students who wish to join the Royal Navy, British Army, RAF, or Defence Engineering and Science Group (DESG) as technical officers after graduation.

Find out more on the DTUS programme.

Facilities and support
The School of Engineering is located in Merz Court in the heart of our city-centre campus.

Continued investment in our undergraduate teaching laboratories means that you can learn in excellent facilities – described as the best in Europe by leading industrial visitors.

We have dedicated computing facilities with industrially relevant software and hardware. These are refreshed every two years so you are always working with the most up-to-date equipment available.

You will have access to state-of-the-art teaching laboratories. These include teaching laboratories for electronics, electrical power/motors, an Intelligent Sensing Lab and smart grids.

You will also benefit from machines laboratory and class 100 clean rooms for the fabrication of semiconductor devices.

Support
To support you in your studies, all new students entering year 1 or year 2 will receive:

- a tablet so you can download the online learning resources you’ll need for your course (helping us to make our campus more sustainable);
- a start-up pack containing essential personal protective equipment and text books.

You’ll have access to a personal tutor throughout your degree – an academic member of staff who can help with academic and personal issues.

Peer mentors will help you in your first year. They are fellow students who can help you settle in and answer any questions you have.

Social activities
There’s a highly active student-led society, ShockSoc, which organises regular social events.
# Course Details

## Modules for 2019 entry

### Please note

The module and/or programme information below is for 2019 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 2020 entry will be published here as soon as it is available (end of May 2020).

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.

## Stage 1

### Compulsory modules

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Name</th>
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<tbody>
<tr>
<td>EEE1001</td>
<td>Fields, Materials and Devices</td>
</tr>
<tr>
<td>EEE1002</td>
<td>Electronics I</td>
</tr>
<tr>
<td>EEE1003</td>
<td>Circuit Theory</td>
</tr>
<tr>
<td>EEE1005</td>
<td>Signals and Communications I</td>
</tr>
<tr>
<td>EEE1008</td>
<td>C Programming</td>
</tr>
<tr>
<td>EEE1009</td>
<td>Communication Skills and Innovation</td>
</tr>
<tr>
<td>ENG1001</td>
<td>Engineering Mathematics I</td>
</tr>
</tbody>
</table>

## Stage 2

### Compulsory modules

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Name</th>
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</thead>
<tbody>
<tr>
<td>EEE2007</td>
<td>Computer Systems and Microprocessors</td>
</tr>
<tr>
<td>EEE2008</td>
<td>Project and Professional Issues</td>
</tr>
<tr>
<td>EEE2009</td>
<td>Signals and Communications II</td>
</tr>
<tr>
<td>EEE2012</td>
<td>Control and Electrical Machines</td>
</tr>
<tr>
<td>EEE2013</td>
<td>Digital Electronics</td>
</tr>
<tr>
<td>EEE2014</td>
<td>Semiconductor Devices and Analogue Electronics</td>
</tr>
<tr>
<td>EEE2015</td>
<td>Electromagnetic Fields and Waves</td>
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</tbody>
</table>

## Stage 3

### Compulsory modules

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Name</th>
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</thead>
<tbody>
<tr>
<td>EEE3001</td>
<td>Linear Controller Design and State Space Analysis</td>
</tr>
<tr>
<td>EEE3002</td>
<td>Electrical Machines</td>
</tr>
<tr>
<td>EEE3011</td>
<td>Electric Drives</td>
</tr>
<tr>
<td>EEE3021</td>
<td>Renewable Energy Systems and Smart Grids</td>
</tr>
<tr>
<td>ENG2001</td>
<td>Accounting, Finance and Law for Engineers</td>
</tr>
</tbody>
</table>

### Optional modules

You will take one of the following modules:

- EEE8108 Individual Project and Dissertation (MEng)
- EEE8109 Individual Project and Dissertation (MEng)
- EEE8110 Individual Project and Dissertation (MEng)

And also one of these modules:

- EEE8111 Study Project
- EEE8112 Study Project

You also take 20 credits from the following list:

- EEE3003 Introduction to the Basics of Modern Power Electronics*
- EEE3004 Digital Signal Processing
- EEE3007 Design and Test of Digital Systems
- EEE3008 Industrial Automation and Robotics*
- EEE3009 Real Time and Embedded Systems
- EEE3012 Integrated Circuit Design
- EEE3013 Image Processing and Machine Vision
- EEE3014 Power System Operation*
- EEE3015 Telecommunication Networks
- EEE3016 Photonics
- EEE3018 Digital Control Systems*
- EEE3020 Electronic Devices

Modules marked with * are recommended.

### 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. Find out more about Work Placements.

## Year 4 (Placement Year)

On completion of Stage 3 and before entering Stage 4, you may as part of your studies for the degree spend a year in a placement with an approved organisation. If you are required to re-sit your Stage 3 assessment, you must delay the start of your placement until you have done so. If you fail Stage 3, you may not complete a placement year.

NCL3000 Careers Service Placement Year Module
Stage 4

Compulsory modules
EEE8113  Group Design Project
EEE8114  Industrial Project
EEE8106  Extended Course Work on Applications and Design (ECAD)
You will also take the following specialist modules:
EEE8102  Design of Modern Electrical Machines and Drives
EEE8105  Distributed Control Systems (MEng)

Optional modules
You select modules from the Stage 3 optional modules above, taking your total credit value to 120 credits.

Teaching and assessment

Study at the cutting edge
Our degrees are informed by the research discoveries of our expert researchers - we have four leading research groups. You learn from leading experts in the field and study at the cutting-edge of the discipline. Our research-informed teaching ensures you develop knowledge of current and future breakthrough technologies.

Teaching methods
You will work on real-world engineering projects set by companies with which we have strong links, applying your skills to real challenges faced by potential employers. Contact hours are made up of lectures, laboratory sessions and tutorials. Up to 10 hours will consist of practical sessions in our laboratories where you will take part in experiments and project work.

Assessment methods
Assessment is by in-course assessment such as laboratory reports and tutorial exercises, or by examinations.

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

Careers

Electrical Power Engineering careers
In addition to the technical and practical expertise that you will gain from studying electrical, electronic and computer engineering, you will discover that our degrees are designed to provide you with opportunities to learn and develop transferable skills, such as analytical and problem-solving, project-working both as part of a team and on your own, communicating with others, planning and time management, and of course computer literacy, all of which are vital for the employment market.

Our recent graduates report earning between £23,000 and £26,000 per year (Destinations of Leavers from Higher Education survey, 2014–15). You can expect this to increase significantly over the course of your career. Within six months of graduating, 97% of our graduates were in employment or further study.

Electrical and electronic engineers are in demand within the UK and overseas. Within electrical engineering the main employment areas include electrical supply and distribution, power systems, transport and electrical machinery.

Opportunities within electronics exist in electronic circuit design, instrumentation and control for safety on industrial plants, e.g., manufacturing, oil and gas, pharmaceutical, telecommunications, mobile technology, automotive and aviation electronics and medical systems. Some graduates enter a related field as IT professionals. Popular areas outside of engineering include commercial, industrial and public sector management.

Graduate engineering posts will usually give you the opportunity to work towards incorporated or chartered engineer status.

Electrical and electronic engineers are expected to make a quick and useful contribution at work, so it may not be enough to rely on your technical expertise. Relevant vacation work experience and industry placements will greatly increase your level of employability.

Find out more about the career options for Electrical and Electronic Engineering from Prospects: The UK’s Official Careers Website.

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)**

2020 entry:
Tuition fees for 2020 entry are not yet available.

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.

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

**Tuition Fees (EU students)**

2020 entry:
Tuition fees for 2020 entry are not yet available.

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.

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

**Tuition Fees (International students)**

2020 entry:
Tuition fees for 2020 entry are not yet available.

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.

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.

**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.
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

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.

Students relaxing in the Old Quadrangle.