Electrical energy is vital in today’s society. It powers manufacturing and transport, provides heat and light, and underpins all aspects of modern life.

One of the biggest challenges facing society is the need for reliable energy supplies with minimum impact on the environment. This MEng course responds to that need, producing engineers qualified to deal with the complex issues surrounding the supply of electrical energy and the applications of electrical power.

The development and increasing use of renewable energy sources needs engineers with skills in advanced electrical technologies. The search for carbon-neutral energy sources requires innovative engineering solutions involving fuel cells, solar, wind, wave and tidal technologies.

Examples of such innovation include the Department’s energy project in The Gambia and opportunities exist for students to be part of the annual expedition there to install solar technologies into local communities.

In its Energy Policy, the Scottish Government stated that it is Scotland’s ambition to become a world leader in clean, green energy. With a recognised shortage of specialist engineers in this sector, graduates of this course have excellent career prospects.

**Course Structure**

Years 1 to 3 follow the structure of the core BEng/MEng Electronic & Electrical Engineering degrees, with classes providing the key material and professional skills required by all engineers.

In Year 4 optional classes provide a taster of other specialist fields on offer, along with an individual project that can be tailored to your own area of interest.

In Year 5 students deepen their specialist knowledge and enhance their groupworking skills through a major group project. As well as providing technical challenges, this develops skills in planning, management and finance.

This course has full accreditation from the Institution of Engineering and Technology (IET), meaning after relevant industrial experience, you can gain ‘chartered
engineer (CEng)’ status — a must for most employers — fast-tracking your way to professional recognition.

The Department has extensive industrial academic collaborations and a range of opportunities exist for work placements throughout this degree within the UK, EU, North America and Far East.

Course Syllabus

Year 1 – Core Engineering & Science Skills
You will study a variety of technical subjects including electronic & electrical theory, software design, the fundamental principles and processes of electronic devices, analogue and digital circuits, maths for engineering, and business management. You complete group design projects such as hydrogen-powered vehicles and wireless communications to gain practical training in core engineering applications and develop project management skills.

Year 2 – Core Engineering & Technology Skills
You build on subject material taken in Year 1, and study specialist subjects including the design and analysis of electrical systems, analogue and digital electronics, electromagnetism, advanced physical electronics, linear signals and systems, and engineering design and manufacture. Personal development and Maths classes continue.

Year 3 – Specialist Engineering Skills
You acquire specialist engineering skills through a bespoke curricula that includes the following topics:

- Signals and Communications Principles
- Electromagnetics
- Embedded Systems Design
- Engineering Innovation and Management
- Instrumentation Systems
- Power Engineering
- Project Management Methods
- Renewable Energy Principles and Technologies

Year 4 – Specialist Engineering Skills
You undertake a significant individual project to enhance your technical and project management skills, and develop specialist engineering knowledge by choosing classes that cover the following topics:

- Control Principles and Techniques
- Electric Vehicle Technologies
- Energy Supply Network Protection Systems
- Power Electronics and Machines
- Power System Analysis and Design

Our students form part of the expedition teams which visit the Renewables Project in The Gambia.
Year 5 – Engineering for Your Professional Future
A major group project and selection of classes from the advanced topics below, are completed:

- Advanced Power System Protection
- Control of Industrial Processes
- Electricity Market & System Economics
- Electronics for Energy Control
- High Voltage Technology Design & Applications
- Instrumentation and Condition Monitoring
- Wind Energy Systems

Teaching and Assessment
A blend of student-centric methods, including interactive lectures, small group problem-solving tutorials, practical laboratories as well as industrial visits and seminars by professional engineers are used throughout all years of study. The programme ensures that you develop not only technical engineering and computing expertise, but also, and equally importantly, communication, project management, leadership and entrepreneurial skills.

There is a wide range of assessment methods, including assignments, examinations and individual and group-based projects. Both class delivery and assessment make use of web-based and multimedia facilities.

The course typically consists of around 10 lectures, five tutorial/problem-solving classes and three practical classes per week. Students also undertake around 20 hours of self-study.

“...In every area of my study, the lecturers and staff at Strathclyde were helpful and supportive, sharing guidance and knowledge to help my research, education and growth as an engineer. I’m now looking forward to returning to start my PhD.

Paul Turner, MEng Electrical Energy Systems 2014
Scholarships and Work Placements
Our department runs one of the UK’s largest industry-supported Scholarships Programme, providing annual bursaries of up to £5000, as well as help with books, software and paid summer internships with a range of well known, international organisations such as Rolls-Royce, ScottishPower and AMEC.

We are the only Department in Scotland in the IET Power Academy and have been hand-picked by several leading global engineering organisations, such as BP and Siemens, to participate in their scholarship schemes. The Programme, open to all our students, includes:

- S6 Bursaries – open to eligible S6 Scottish applicants
- Royal College Awards – a bursary for international applicants
- FM Bruce Scholarships
- AMEC Electrical Engineering Scholarship
- Lloyd’s Register Foundation Scholarship
- BP Scholarships
- IET Power Academy
- Engineering Excellence Scholarships with MacTaggart Scott, ScottishPower and Wood Group

The Department
The Department of Electronic & Electrical Engineering is internationally renowned for its teaching and research quality, and has an excellent reputation for student satisfaction and graduate employment. It consistently gains first-class ratings in the independently published UK University league tables.

World-leading electrical and renewable energy research going on in the Department feeds into undergraduate teaching and projects. Examples include the use of high voltage pulses to sterilise medical equipment and foodstuffs; fuel cells and electric vehicles; intelligent monitoring systems for substation equipment; advanced power systems and power electronics.

This course delivers an education that is appropriate for today’s competitive market and one that is recognised by employers.
Careers
A diverse range of well-paid and highly rewarding career opportunities are available to graduates of this course:

- renewable energy technologies
- design, operation and control of new power networks
- fuel cell development
- power electronics for control of electrical energy systems
- combined heat and power technologies
- electrical systems for transport

Electrical energy is increasingly preferred for powering transport so the automotive, aerospace, rail and shipbuilding industries will need specialist graduate engineers to design and realise the transport systems of the future.

Career opportunities in designing and developing new technology and equipment in renewable energy, and health monitoring for electrical plant are becoming increasingly common. Researchers in the energy field are also needed to develop new systems, materials and processes to meet future requirements.

All the major employers target our graduates for recruitment purposes, including ScottishPower, Rolls-Royce, National Grid, ABB, SSE, Lloyd’s Register, RWEpower, Mott MacDonald, BP, Siemens, Network Rail, and British Energy.