Royal Holloway is one of the UK’s leading research intensive universities. One of the larger colleges of the University of London, we are strong across the sciences, social sciences, arts and humanities. We were ranked 19th in the UK (129th in the world) by the Times Higher Education World University Rankings 2015-16, which described us as ‘truly world class’.

As an international community, with students from 130 countries, we focus on the support and development of the individual. Our friendly and safe campus, in Surrey, 40 minutes by train from central London, provides a unique environment for university study where students quickly feel at home.

“One of the 16 most beautiful universities in the world” (Daily Telegraph).

Visit us

Our College and departmental Open Days offer you a unique opportunity to come and find out more about us and get a taste of what university life is really like. Parents and friends are very welcome to come with you. To find out dates and register to attend please visit our website: royalholloway.ac.uk/opendays
Welcome to Electronic Engineering

The products of electronic engineering are all around us in our daily lives. This has created a demand for excellent engineers with a creative passion to put technology into the service of humankind by harnessing science and mathematics. Creativity is at the heart of all great engineering inventions, solving problems and implementing new ideas into smaller and faster devices to enhance human existence.

Here at Royal Holloway it is an exciting and highly creative time as we design a brand new building in which we will teach new degree programmes in Electronic Engineering and grow new research groups around our strengths in related subjects. Project-led activities will be at the heart of our teaching to encourage entrepreneurship and group working in all stages of the taught programmes.

We invite you to join us and become part of the global teams of electronic engineers who are striving to find solutions and improve lives in our fast-moving technological world.

Professor David M Howard
Head of Electronic Engineering

CONTACT DETAILS
Department of Electronic Engineering

HEAD OF DEPARTMENT
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+44 (0)1784 414004

CONNECT WITH US
@RHElecEng
royalholloway.ac.uk/electronicengineering

MORE INFORMATION
This brochure is designed to complement Royal Holloway’s Undergraduate Prospectus and information on the department’s website at royalholloway.ac.uk/electronicengineering
It is also available as a PDF at royalholloway.ac.uk/studyhere
Why study Electronic Engineering?

Products that change the ways we live are not just clever gadgets that end up gathering dust in a cupboard somewhere; they change the way in which people go about everyday activities and provide solutions to some of the biggest problems of our age. From the sustainability of the environment in which we and future generations will live, to addressing the health of the ageing population, the development of secure communication and computer systems that enhance living – there has never been a more exciting time to study Electronic Engineering.

Excellent engineering creates desirable fully fit-for-purpose products that result from the ingenious application of creativity in concept, design and specification and the inventive application of science and technology to realise the final product.

Long-lasting innovation arises through the harnessing of creativity; the kind of originality and thinking which have stronger origins in artistic endeavours and experiences than in scientific ones.

Smart transportation, the internet of things, mobile devices, computers, medical monitoring, domestic appliances, communication and broadcasting are all areas that have electronic engineering at their hearts. Data input, data transmission, data reading and data storage rely on electronic engineering. Global dependence on the use of electrical energy needs to become more sustainable in the future, with a greater emphasis on the renewable energy sector.

Electronic Engineering at Royal Holloway

The Department of Electronic Engineering welcomes its first undergraduates in September 2017. Our degree programmes will meet market needs, linking excellent engineering with the ingenious application of creativity as the starting point for invention. Our teaching will, wherever possible, be project-led and carried out in teams to reflect typical engineering practice, reinforced by practical laboratory work. Coupled with this will be the underpinning mathematics and science needed to enable electronic solutions to be created to address real-world needs and problems.

RESEARCH-LED TEACHING

Royal Holloway has earned an international reputation for inspiring, research-led teaching across STEM subjects. Our staff bring a variety of research interests to their teaching, including energy generation from wind, voice science and music technology, designing Electromagnetic sensor for power station steels and condensed matter physics and spintronics. Group projects and individual project topics will also be inspired by current research, enabling you to add your own individual contributions to the research process.

Opportunities to study for research degrees (MSc and PhD) will be available well in time for our first cohort of graduates.

SUPPORTIVE LEARNING ENVIRONMENT

Practical project work will form a major element of your degree, in groups, in pairs and sometimes individually, and in all laboratory sessions staff are on hand to guide you and answer questions. Lab space, components and practical support will be available for you to carry out your own circuit and project builds in your particular interest areas as appropriate. Teaching will be supported through Moodle on-line learning support.

Our Personal Advisor system means that you receive personalised advice and pastoral support from a single faculty member throughout your degree. College-wide support services also help you get the most out of your time here. We are endeavouring to create a gender neutral department and positively encourage and support female applicants.

A GREAT PLACE TO LIVE AND LEARN

Add to this the engaging atmosphere at Royal Holloway, with its well-equipped campus, vibrant international student community and beautiful surroundings close to the global city of London, and you have all the ingredients for an enjoyable and rewarding experience.

EXCELLENT CAREER OPPORTUNITIES

Studying electronic engineering will prepare you for a career in a multitude of areas within and beyond electronic engineering. You will develop a strong set of transferable skills which include developing verbal and written communication skills as well as experiencing group working and developing awareness and understanding of how individuals can offer a variety of contributions to a team in differing ways.
Degree programmes

Electronic Engineering can be studied as a three year BEng in Electronic Engineering or four year MEng in Electronic Engineering, and both can include a year in industry for which we help you to find a suitable placement. Whichever degree you choose, you will learn the theoretical and practical knowledge for tomorrow’s electronics industries, acquiring valuable skills through hands-on, project-based activities to prepare you for an exciting career ahead.

### Degree Programmes

<table>
<thead>
<tr>
<th>Degree Programmes</th>
<th>Duration</th>
<th>UCAS Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEng Electronic Engineering</td>
<td>3 years</td>
<td>HH61</td>
</tr>
<tr>
<td>BEng Electronic Engineering with a year in Industry</td>
<td>4 years</td>
<td>H661</td>
</tr>
<tr>
<td>MEng Electronic Engineering</td>
<td>4 years</td>
<td>H61H</td>
</tr>
<tr>
<td>MEng Electronic Engineering with a year in Industry</td>
<td>5 years</td>
<td>H6H1</td>
</tr>
</tbody>
</table>

### Accreditation

All our Electronic Engineering degrees will go forward for accreditation by The Institution of Engineering and Technology (IET) in 2018. Formal accreditation is expected to be granted after the first intake of students has progressed to their second year of study.

### Admissions and Entry Requirements

The department will open with 30 undergraduate students in September 2017. Applicants from all backgrounds will be welcomed on the basis of achievement at A-level or equivalent qualifications.

Please check our website for current entry requirements.

All prospective applicants and their parents are encouraged to visit the campus for one of our Open Days and/or Applicant Visit Days to meet our staff, hear more about the degree programmes and get to know more about the College, and options for accommodation. Example projects will be on display and staff will be on hand to discuss matters relating to teaching, accreditation, research, college life and career prospects.

### Scholarships and Bursaries

Royal Holloway scholarships and bursaries are available (eligibility criteria apply). These include the Principal’s Excellence Scholarships worth £3,000 for high achieving applicants. Please see our website for details.

Royal Holloway has a comprehensive admissions policy which sets out how your application will be dealt with. For further information visit: royalholloway.ac.uk/admissionspolicy

“...My research interests include HVDC transmission systems and wind generation and the impact of integration into AC systems. I have also worked in collaboration with National Grid UK. My advice to students is think about what your passions are and decide whether Electronic Engineering could help you make a change in that area.”

Dr Stefanie Kuenzel
Lecturer & Admissions Tutor
Degree structure

Our degree structure has a common first three years for the BEng and MEng programmes. The fundamentals of electronic engineering are covered in years 1 and 2 with module choice being available in years 3 and 4.

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embedded systems team project 1</td>
<td>Embedded systems team project 2</td>
</tr>
<tr>
<td>Communications engineering 1</td>
<td>Communication engineering 2</td>
</tr>
<tr>
<td>Electronic circuits and components</td>
<td>Energy generation, conversion and distribution</td>
</tr>
<tr>
<td>Principles of sustainable engineering</td>
<td>Control engineering</td>
</tr>
<tr>
<td>Programming in C++</td>
<td>Digital coding and data networking</td>
</tr>
<tr>
<td>Mathematics for engineering/Science 1</td>
<td>Software engineering</td>
</tr>
<tr>
<td>Mathematics for engineering/Science 2</td>
<td>Electronic materials and devices</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual project</td>
<td>Group project</td>
</tr>
<tr>
<td>Signal processing</td>
<td>Research report</td>
</tr>
<tr>
<td>Renewable energy systems</td>
<td>Advanced wireless communications</td>
</tr>
<tr>
<td>Principles of engineering company management</td>
<td>Engineering leadership</td>
</tr>
<tr>
<td>Smart transportation</td>
<td>Electronics in advanced manufacturing</td>
</tr>
<tr>
<td>Voice and music technologies</td>
<td>Personal communications technology</td>
</tr>
<tr>
<td>Human factors and healthcare engineering</td>
<td>Imaging systems for medicine and industry</td>
</tr>
<tr>
<td>Applications of cryptography</td>
<td>App programming</td>
</tr>
</tbody>
</table>

The above list of modules is offered as guidance. Please note that the precise list may vary from year to year.

“My research is in the analysis and synthesis of singing, speech and music. This includes digital speech and singing synthesis based on replicating virtual vocal tracts acquired from magnetic resonance imaging; voice pitch analyses for singing development, detection of babbling in infants to encourage speech learning, and a Vocal Tract Organ to recreate human vowel sounds.”

Professor David M Howard
Head of Department
Teaching and assessment

Teaching activities include lectures, workshops and seminars with practical project work carried out in groups and individually in purpose-built thinking and fabrication laboratories.

Various assessment methods will be used including examinations for theoretical subjects, formal presentations, reports and practical demonstrations for project work with an additional viva voce examinations for final year individual projects. Students are expected to review lecture material after lectures to support their learning and to preview laboratory scripts before coming to laboratory sessions.

Fundamental to the industrial workplace is group working, where excellent written and verbal communication skills are highly valued and sought after; these will be developed and assessed formally as part of project-based work. All students will have an allocated Personal Advisor as someone with whom any issues can be discussed to enable advice and help to be given as appropriate.

**BEng (3 Years)**
- **Year One**
  - All modules are compulsory
- **Year Two**
  - All modules are compulsory
- **Year Three**
  - Students take two compulsory modules and three elective modules

**BEng with Year in Industry (4 Years)**
- **Year One**
  - All modules are compulsory
- **Year Two**
  - All modules are compulsory
- **Year Three**
  - Students take a year in industry
- **Year Four**
  - Students take two compulsory modules and three elective modules

**MEng (4 Years)**
- **Year One**
  - All modules are compulsory
- **Year Two**
  - All modules are compulsory
- **Year Three**
  - Students take two compulsory modules and three elective modules
- **Year Four**
  - Students take two compulsory modules and three elective modules

**MEng with Year in Industry (5 Years)**
- **Year One**
  - All modules are compulsory
- **Year Two**
  - All modules are compulsory
- **Year Three**
  - Students take two compulsory modules and three elective modules
- **Year Four**
  - Students take a year in industry
- **Year Five**
  - Students take two compulsory modules and two elective modules

“My research interests are in the areas of condensed matter physics, nanotechnology, spintronics, microelectronics, low-dimensional materials and systems, and UHV instrumentation, directed toward the advanced information storage and quantum computation.”

Dr Wenqing Liu
Lecturer
The department

The Department of Electronic Engineering complements Royal Holloway’s diverse research portfolio with its own unique areas of research such as communications, nanotechnology, music and media technology, human factors, sustainable and renewable energy, novel computing and signal processing.

A LONG HISTORY
As Royal Holloway’s newest department, we join a long and proud history, stretching back to 1849 when Bedford College (which merged with Royal Holloway in 1985) was founded in London, and 1886, when Queen Victoria opened Royal Holloway College in Egham, Surrey. Since then, Royal Holloway, University of London has grown exponentially due to its success, and along the way developed a reputation for cutting edge research and outstanding teaching. Bedford College was the first English university to appoint a female Professor and, with Royal Holloway College, was at the forefront of providing opportunities for women to study at university. This underpins our efforts to promote both equality and women in science, and we strongly encourage and support female applicants.

WOMEN IN SCIENCE
The department is in receipt of an HEFCE-funded development initiative to encourage more female engineers to address the national shortage; a recent skills survey conducted by the Institution of Engineering and Technology (IET) revealed that women make up just 9% of the UK’s engineering workforce.

COLLEGE AND DEPARTMENTAL OPEN DAYS
Our College Open Days and Applicant Visit Days offer a unique opportunity for prospective students and their parents and friends to come and find out more about us and get a taste of what university life is really like. Invitations to Applicant Visit Days are sent out after we receive an application from you.

A FRIENDLY COMMUNITY
Royal Holloway has a vibrant social scene and a friendly campus environment.

The College has been awarded the Athena SWAN Bronze Award for our efforts to promote both equality and women in science, and we strongly encourage and support female applicants.

As well as the activities organised by our dynamic Students’ Union, most departments have a social society run by students. These bring students together through a mixture of social and academic events, ranging from pub quizzes and trips to guest lectures and career talks.

As part of a group of potential applicants, you will spend three to four hours with us. A member of staff will give an introductory talk, explaining what studying for a degree is like, what the examinations are like, the degrees we offer, and so on. You will have an interview and the opportunity to meet other members of the academic staff. Our student helpers will take you on a tour of the campus, tell you about life on campus and answer any questions from a student’s viewpoint. There will be opportunities to ask questions throughout the day.

Dates of College and Departmental Open Days are available from our website: royalholloway.ac.uk/studyhere
Science building

The Department of Electronic Engineering will be based in a purpose-build building on three floors, right at the heart of our university campus. Each floor has a different function in relation to the activities that are carried out on it, giving project-led activities their own space that is separated from other forms of teaching, research and staff offices. Engaging group collaborative working spaces are a core design focus throughout the building. Access to the building will be 24/7 to cater for all working schedules.

The ground floor comprises of a large lecture theatre and two seminar rooms with adjustable seating to support group discussions and interactive learning. It will also house the electronics teaching laboratory and the PC laboratory.

On the first floor a creative learning suite with three adjacent spaces will support the project based learning process with an enquiry based learning space for group thinking (ideas/ingenuity), a project laboratory where circuits are built up (test and development), and a fabrication laboratory – with 3D printers, laser cutters and printed circuit board creation (product prototyping).

The second floor is where the academic staff and administrative staff are based in a semi-open plan working environment that includes meeting rooms for private tutorials and supervision. Research staff are also on this floor to enable close contact to be maintained with their supervisors.

The roof will be a field laboratory where solar panels will be situated on which measurements can be made to explore the efficiency of these energy generation devices under different weather conditions. In addition, a mechanism to shade the solar panels will enable controlled experiments to be carried out that explore how the output energy from the panels varies as a function of changes in shading of the solar input.

A BEAUTIFUL CAMPUS

Our campus is one of the most beautiful in the world with numerous teaching and study spaces, bars and cafés, high-quality accommodation, and sports facilities. All this is set in 135 acres of stunning parkland.

Our location in Surrey on the edge of Windsor Great Park has excellent national and international communication links (around 40 minutes by train to London Waterloo, and seven miles from Heathrow).

Our inspiring and iconic Founder’s Building is complemented by outstanding modern facilities, including a new Library and Student Services Centre opening in 2017.
Your future career

INDUSTRY VIEW

“For decades to come there are going to be interesting, wonderful jobs for engineers in just about anything that interests you. You could make someone’s life better, you could change the world. There is this incredible opportunity for engineers to be out there making a difference to the world, to the way we live and work, and to the planet.”

Naomi Climer
President at Institution of Engineering and Technology (IET)
(The Independent)

LINKS WITH INDUSTRY AND YOUR FUTURE CAREER

Our location within the South East regional hub of electronics businesses facilitates links with the majority of leading UK based electronics companies who can offer potential industrial year-out placements, vacation internships and post-degree employment. Through close connections with our Industrial Advisory Committee, we will ensure that our curriculum and the skills and knowledge you will gain are industrially relevant.

Employers are looking for graduates with up-to-date knowledge, excellent written and verbal communication skills, experience of group working, practical backgrounds in applying ingenuity and developing inventive scientific principles to solve problems. As a graduate you will take with you the theoretical and creative practical skills that tomorrow’s electronic engineers need to embark on a fulfilling career creating technical solutions for an evolving world. These skills will be underpinned with confident practiced verbal and written communication abilities that are key to successful industrial team working.

Career prospects are excellent for electronic engineers with attractive starting salaries. The UK is short of qualified engineers; a shortfall of one million in all branches of engineering over the next 10 years is often quoted. Apart from career roles in electronic engineering, many engineering graduates join the banking sector, enter into science and mathematics teaching, or go on to research after studying for specialist MSc degrees or following a PhD.

ROYAL HOLLOWAY CAREERS SERVICE

As part of The Careers Group, University of London, the Royal Holloway Careers Service is able to provide a wealth of advice and information about local, national and international opportunities.

The careers service can help with practice interviews, CV preparation and finding placements and voluntary work to enhance CVs. All students have access to webpages, which are full of up-to-date information and opportunities, with links to other useful resources. Students are reminded of forthcoming careers events such as talks, job fairs and recruitment rounds by large organisations and can talk to a dedicated careers adviser.

PLACEMENT IN INDUSTRY/YEAR IN INDUSTRY

The Department has many links to regional and national industry. Through our contacts and in conjunction with Royal Holloway’s careers service, we will assist students in securing placements during their year in industry. Whilst not compulsory, a placement year means that students can develop their skills and gain an insight into the electronic engineering industry.

Students can opt to change degree programmes to include a year in industry during their first and second year if they meet the specific requirements.

Gaining commercial experience increases career prospects and you’ll be better equipped to enter the dynamic, fast-moving, technological world. It also gives you a taste for what graduate life is like in your field of interest.
“I was inspired to become an Engineer whilst watching Formula 1 in my third year of university. I was studying a few modules on fluid dynamics at the time and thought ‘wow – I could learn about this and work in that, and also potentially win a world championship.’ The thought of doing something I loved while working on something so fast and exciting really drew me into that field. Engineering is important because it is what makes the world go round. It helps us break down, understand and rebuild bigger and better – pushing technology to the limit!”

Katie Lawrence
BSc Mathematics
Performance Engineer at Land Rover BAR

“At Royal Holloway, I found my passion for fluid mechanics whilst studying for my Maths degree. It was my Maths degree which gave me a really strong analytical ability. The skills in fluid dynamics and programming, which I took forward to an MSc and PhD, led me to my career in renewable energy. As a research Engineer in Offshore Wind, I work on and manage a range of projects at any one time. Currently I’m investigating methods to make offshore wind turbine maintenance safer and looking at the feasibility for floating offshore wind turbines. There is no generic engineer – studying an engineering subject will allow you to shape a career around your areas of interest and the skills that you love.”

James McNaughton
MSc Mathematics
Research Engineer, Offshore Wind at EDF Energy R&D UK Centre

“My time at Royal Holloway has helped my career because it developed the problem-solving skills which allow me to adapt to almost any technical role. Engineering, as a subject, covers a lot more than people think it does and it’s a brilliant, interesting career path to choose. Without engineers, we wouldn’t have roads to drive on, houses to live in and pictures of Pluto to marvel over.”

Charlotte Ayres
MSc Physics
Systems Engineer for Missile Systems at MBDA