ROYAL HOLLOWAY
University of London

PROGRAMME SPECIFICATION

This document describes **MEng Honours Degree programmes in Electronic Engineering.** This specification is valid for new entrants from **September 2018**.

The aims of all MEng Electronic Engineering Honours Degree programmes are:

- to engage students imaginatively in the process of learning through creative hands-on group and individual project based activities, enabling them to develop leadership, management and independent critical thinking and judgement;
- to encourage students to appreciate how electronic engineering is the heart of many systems.
- to equip students with the technical knowledge, practical skills and confident verbal and written communication abilities that demonstrate their decision making skills in new, complex and unpredictable situations in industrial team working;
- to produce graduates that fully meet the demands required for employment in industry, including independent learning in the development of new ideas ;
- to gain experience in the application of creativity in solving engineering problems;
- to encourage an awareness of environmental and social issues, investigating new materials and using them in ways that have a beneficial effect on humanity;
- to encourage students to take progressive responsibility for their own study through negotiating subject areas of specialism with each other in practical's and workshops, through the informed choice of options and an individual major project in the final year that leads to a final product;

The MEng degree programmes correspond to level 7 in the QAA framework. The length of the degree varies from four years for the standard MEng to five years for the MEng with a year in industry programme.

The programmes are designed to fully meet the educational requirements for CEng registration.

Apart from the year in industry, MEng programmes are delivered in four stages, each of which comprises one year of full-time study during which the student must follow courses to the value of 120 credits

The programmes provide progressive structures in which students are able to gain ever-wider knowledge and understanding, and appropriate skills. The programmes contain a combination of mandatory courses to introduce students to the theoretical knowledge and practical skills, with a range of stage three specialist options. The structure in stage one and two encourages students to work in teams, and in stage three to develop their own interests through informed choice among specialist options. In stage three all students are required to produce an individual project from conception through to production. Stage 4 develops group working/team dynamics and personal research techniques. In Stage 4 advanced options are available which allow personal and in-depth research, evaluation and practical application skills to be developed.

Further information

For students first registered in or after September 2018
Version 2.0
Dated: November 2018

Indicators of quality and standards
List of programmes, with details of awards, degree titles, and accreditation and teaching arrangements

This document provides a summary of the main features of the programme(s), and of the outcomes which a student might reasonably be expected to achieve if full advantage is taken of the learning opportunities provided. Further information is contained in the College prospectus, the College Regulations and in various handbooks issued to students upon arrival. Whilst Royal Holloway keeps all its information for prospective applicants and students under review, programmes and the availability of individual courses are necessarily subject to change at any time, and prospective applicants are therefore advised to seek confirmation of any factors which might affect their decision to follow a specific programme. In turn, Royal Holloway will inform applicants and students as soon as is practicable of any substantial changes which might affect their studies.

Learning outcomes
Teaching and learning in the programme are closely informed by the active research of staff, the development of research skills for practical application in electronic engineering particularly in the areas of nanotechnology, spintronics, energy generation, signal processing, communications, smart transport, voice and music technologies, human factors and healthcare engineering, electronics in advanced manufacturing, imaging systems for medicine and industry, app programming, engineering leadership, information security and cryptography. In general terms, the programmes provide opportunities for students to develop and demonstrate the following learning outcomes:

Additional for programmes with a Year in Industry
The year in an industrial placement will provide real world experience of how electronic engineering impacts on the world around us. It gives an appreciation of the importance of well managed product development in a competitive environment. Students will have completed three years of their programme and therefore are more able to solve problems independently bringing in knowledge from current research.

Knowledge and understanding
- extensive knowledge and comprehensive understanding of the scientific principles of electronic engineering, materials, components and circuit design;
- develop systematically methodologies and critiques enabling new designs to be implemented in the context of, for example, mobile communications, computers, transport systems, energy systems, medical applications, domestic appliances, TV, radio, music studios and gaming devices;
- the historical context and developing technologies used in everyday life;
- wide knowledge and understanding of design process and methodologies;
- understanding of concepts from areas outside engineering;
- an understanding of issues facing this and future generations such as green energy provision, communication systems and appliance control;
- sustainability generation and environmental issues;
- development of electronic devices and circuits;
- the practical use of embedded systems;
- the C++ programming language;
- a critical awareness of current issues, current research and their interpretation in the context of professional practice;
- comprehensive knowledge and understanding of mathematical and computer models;
- understanding of business management and practical engineering leadership;
- specialise in an area of personal interest in their individual project;
- comprehensive understanding of relevant research.

Skills and other attributes
- analysis and critical interpretation of text and data;*
- sensitivity to and responsiveness and an understanding of industrial conventions;
- the ability to conduct literary research independently using traditional and electronic resources; *
- use fundamental knowledge to investigate new and emerging technologies;*

- able to assess the limitations of mathematical and computer based models for problem solving;*
- adapt process design and methodology to unfamiliar situations:*
- command of a relevant wider vocabulary and appropriate critical and theoretical terminology;
- planning and execution of formal reports and project-work, bibliographical skills, developing a reasoned argument;*
- advanced written and oral presentation skills, including the ability to present logical and coherent written and oral arguments of varying lengths;*
- the ability to organise and interpret complex information in a structured and systematic way, and to comprehend and develop sophisticated concepts in the context of writing a journal article;*
- the capacity for independent thought and judgement, along with skills in critical reasoning;*
- information technology skills (including word processing, email, WWW, information handling and retrieval), and the ability to engage with the textual use of new media, video, TV, DVD and electronic;*
- experience in group working and properly prepared to present reasoned verbal and written arguments in a confident manner;* interpersonal skills, involving non-judgmental communication whilst recognising and respecting the viewpoints of others;*
- time management and organisational skills including working to deadlines, conducting commercial risk assessments, prioritising tasks, organising work/social time;*
- ability to produce ingenious solutions that are prototyped and brought to product readiness for market;*
- lifelong learning and contributions to the wider community (these include personal motivation; the ability to work autonomously and with others; self-awareness and self-management; empathy and insight; intellectual integrity; awareness of responsibility as a local, national and international citizen; interest in lifelong learning; flexibility and adaptability; creativity).
- leadership skills;*
- evaluating and critiquing practical methodologies;*
- writing a research journal article to a standard suitable for publication;*
- make sound judgements in solving practical problems;*
- autonomous working skills and self-direction in practical work;*

* transferable skills

Back to top

Teaching, learning and assessment

Teaching activities will include lectures, workshops and seminars and practical project work will be carried out in groups and individually in purpose-built thinking, prototyping and fabrication laboratories. In particular, the underlying principles of the programme are the exploitation and development of creative skills in the context of proposing ingenious solutions to emerging problems prior to the prototype and product development stages.

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. In addition, students will be involved in workshops and will produce various forms of creative work. Full details of the assessments for individual courses can be obtained from the Department.

Back to top

Details of the programme structure(s)

Please note that not all courses run each year. A full list of courses including optional courses for the current academic year can be obtained from the Department.

Single Honours Degree programmes

Stage one:

Students must take the following **mandatory** courses:

EE1000 Embedded systems team project 1 (30 credits) condonable

EE1010 Programming in C++	(15 credits) condonable
EE1020 Electronic circuits and components	(15 credits) condonable
EE1030 Communication engineering 1	(15 credits) condonable
EE1040 Principles of sustainable engineering	(15 credits) condonable
PH1110 Mathematics for Scientists 1	(15 credits) condonable
PH1120 Mathematics for Scientists 2	(15 credits) condonable

Stage two:

Students must take the following **mandatory** courses:

EE2000 Embedded systems team project 2	(30 credits) condonable
EE2010 Software engineering for electronics	(15 credits) condonable
EE2020 Communications engineering 2	(15 credits) condonable
EE2030 Energy generation, conversion and distribution	(15 credits) condonable
EE2040 Control engineering	(15 credits) condonable
EE2050 Digital coding and data networking	(15 credits) condonable
EE2060 Electronic materials and devices	(15 credits) condonable

Stage three:

Students must take the following **mandatory** courses:

EE3000 Individual project	(45 credits) non-condonable
EE3010 Signal processing	(15 credits) condonable

plus choose options equal to the value of 60 credits from a list of stage three courses offered by the Department.

Stage four:

Students must take the following **mandatory** courses:

EE4000 Group project	(30 credits) non-condonable
EE4010 Research project	(30 credits) condonable

Plus choose options equal to the value of 60 credits from a list of stage four courses offered by the Department.

For the title with a year in industry

Students spend year 4 in industry (i.e. on a work placement) and must take the following mandatory course:

EE3001 Year in Industry	(30 credits) non-condonable

Students are thus assessed on 150 credits in their final year.

Back to top

Progression and award requirements

The progression and award requirements are essentially the same across all Honours Degree programmes at Royal Holloway as outlined in the College's Undergraduate Regulations. On some programmes there may be a requirement to pass specific courses in order to progress to the next stage or to qualify for a particular degree title and this will put restrictions on courses in which failing marks can be condoned (see programme structure above for details). Additionally there are requirements on the number of courses that must be passed in order to qualify for particular joint or combined Honours degrees

For IET accreditation a maximum of 30 credits can be condoned across stages 1 and 2. Failing marks must be between 35-39%. A further 30 credits can be condoned in stage 3 with marks 0-39%. To be eligible for the MEng Award students must pass (pass mark is 50%) at least 90 credits in the Final Stage (a cumulative total of at least 390 credits) and have condonable fails of 45 – 49% in the remaining 30 credits.

Students are considered for the award and classified on the basis of a weighted average. This is calculated from marks gained in courses taken in stages two, three and four, and gives twice the weighting to marks gained in

stage three and four. The College's Undergraduate Regulations include full details on progression and award requirements for all undergraduate programmes offered by the College.

- EE3000 Individual Project must be passed for progression to the final year of the MEng, and where applicable, to the Year in Industry.
- For the award of MEng in Electronic Engineering EE4000 Group Project must be passed.
- For the award of MEng Electronic Engineering with a year in industry E3000 Individual Project, EE3001 Year in industry and EE4000 must be passed.

Failure to pass the group project (EE4000) and its resit would mean being unable to graduate with an accredited MEng. The BEng will have been completed successful to have entered the MEng year, and therefore an accredited BEng Electronic Engineering is offered as an exit route.

Back to top

Student support and guidance

- Personal Advisers: All students are allocated a personal adviser who meets with them regularly through the programme. The adviser's role is to advise on academic, pastoral and welfare issues. Students meet with their personal advisers two or three times during each term. Subsequently, responsibility for additional meetings is placed on the student.
- Year Tutors, Programme Co-ordinators, course leaders, workshop leaders and departmental administrators provide a back-up system of academic, pastoral and welfare advice.
- All staff available and accessible through dedicated office hours system.
- Representation on the Staff-Student Committee.
- Detailed student handbook and course resources.
- Extensive supporting materials and learning resources in College libraries and Computer Centre.
- College Careers and Employability Service and Departmental Careers and Employability Tutor.
- Access to all College and University support services, including Student Counselling Service, Health Centre and the Disability and Dyslexia Services for students with disabilities and Specific Learning Difficulties.

Back to top

Admission requirements

Details of the Department's typical offer for each programme of study is available on the Course Finder web page. However, the Department also has flexibility in its admissions and offers policy and strongly encourages applications from non-standard applicants. Students whose first language is not English may also be asked for a qualification in English Language at an appropriate level. For further guidance it may be helpful to contact the Recruitment and Partnerships Office

Back to top

Further learning and career opportunities

These new and exciting programmes have yet to produce a graduating cohort, but it is expected that graduates will successfully progress
into a wide range of professions, often via Postgraduate studies at Doctoral level. For further details please refer to the Careers and Employability Service.

Back to top

Indicators of quality and standards

Royal Holloway's position as one of the UK's leading research-intensive institutions was confirmed by the results of the most recent Research Excellence Framework (REF 2014) conducted by the Higher Education Funding Council (HEFCE). The scoring system for the REF 2014 measures research quality in four categories, with the top score of 4*

indicating quality that is world-leading and of the highest standards in terms of originality, significance and rigour and 3* indicating research that is internationally excellent. 81% of the College's research profile was deemed to be within the 4* or 3* categories, an increase of over 20% since 2008. The results for the quality of our research outputs placed Royal Holloway 15th in the UK based on an overall Grade Point Average (GPA) score and 20th in the UK for 4* and 3* research.

Back to top

List of programmes

The QAA subject benchmark statement in Engineering describes the general features which one might expect from Honours Degree programmes in the subject, and can therefore be used as a point of reference when reading this document (see www.qaa.ac.uk). UCAS codes are given in parentheses (see www.ucas.ac.uk).

The intention is to apply for formal accreditation by the IET (Institution of Engineering and Technology) to fulfil the educational requirements that enables graduates to use CEng (chartered engineer) after their name following the relevant in industry. This can only be done when a second year cohort is in place. Assuming this is successful, the department have agreed with the IET that accreditation will be back-dated to the initial 2017 cohort.

Single Honours Degree programmes in Electronic Engineering

MEng Electronic Engineering (H61H)
MEng Electronic Engineering with a Year in Industry (H6H1)

Back to top