

Programme Information		
Programme Title	Programme Code	HECoS Code
MEng Electronic and Information Engineering with a Year Abroad	HG6M	For Registry Use Only

Award	Length of Study	Mode of Study	Entry Point(s)	Total Credits	
				ECTS	CATS
MEng Electronic and Information Engineering – Year Abroad <sup>1,2,3,4</sup> (HG6M)	4 years	Full-Time	N/A	245-272.5	490-545
BEng (Ordinary)	N/A	N/A	N/A	150	300
DipHE	N/A	N/A	N/A	120	240
CertHE	N/A	N/A	N/A	60	120

<sup>1</sup>The MEng Electronic and Information Engineering with a Year Abroad is not available for entry. You must apply to join the MEng Electronic and Information Engineering or the MEng Electronic and Electrical Engineering – Technical programme to be eligible.

<sup>2</sup>The MEng Electronic and Information Engineering with a Year Abroad is a pathway where you take a year abroad placement in your fourth year.

<sup>3</sup>Successful visa application might be necessary. Advice on visa requirements can be obtained from the [International Office](#).

<sup>4</sup>If you leave before completing the MEng Electronic and Information Engineering programme, you may be offered the following exit awards at the discretion of the Board of Examiners provided that you have met the minimum ECTS requirements for that award in line with College Regulations: Certificate of Higher Education in Electronic and Information Engineering (45 ECTS at level 4, 60 ECTS total), Diploma of Higher Education in Electronic and Information Engineering (45 ECTS at level 5, 120 ECTS total) and Ordinary Bachelor's Degree in Electronic and Information Engineering (30 ECTS at level 6, 150 ECTS total). These exit awards are not accredited.

Ownership			
Awarding Institution	Imperial College London	Faculty	Faculty of Engineering
Teaching Institution	Imperial College London	Department	Electrical and Electronic Engineering
Associateship	City and Guilds of London Institute (ACGI)	Main Location(s) of Study	South Kensington
External Reference			
Relevant QAA Benchmark Statement(s) and/or other external reference points	Master's award in Electronic and Information Engineering		
<u>FHEQ Level</u>	Level 7		
<u>EHEA Level</u>	2 <sup>nd</sup> Cycle		
External Accreditor(s) (if applicable)			

External Accreditor 1:	Institution of Engineering and Technology		
Accreditation received:	2018	Accreditation renewal:	2024
<b>Collaborative Provision</b>			
Collaborative partner	Collaboration type	Agreement effective date	Agreement expiry date
N/A	N/A	N/A	N/A
<b>Specification Details</b>			
Programme Lead		Director of Undergraduate Studies	
Student cohorts covered by specification		2023-24 entry	
Date of introduction of programme		2019	
Date of programme specification/revision		August 2023	

## Programme Overview

### ABOUT THE DEPARTMENT

The Department's main objectives are to deliver high quality teaching and conduct internationally leading research. The Department carries out research across a wide range of topics, and targets both fundamental advances and practical applications of science and technology. The quality and impact of our research are demonstrated by our many highly cited publications, the personal recognition of our researchers through awards and honours, and the commercial adoption of our results and innovations. Our research also feeds into our teaching, especially in the 4<sup>th</sup> and final year where members of staff bring their research into the classroom and devise exercises in line with research expectations. We see educating the next generation of engineers as a key role, and our graduates are highly valued by industry and commerce around the world. Our undergraduate degrees are aligned to our research strengths, and we are proud of the depth of analytical treatment and the specialised optional subjects we offer within our degree programmes.

Electronic and Information Engineering is considered interdisciplinary in character because Electronic and Information Engineers work in a wide range of areas including robotics, machine learning, communication systems and networking. Design and analysis of systems is at the core of this programme and you will be offered multiple opportunities to develop your skills in this area. The programme offers technical rigour and depth in a wide range of modern engineering topics.

Further information about the Department and our courses is available on our website:  
[www.imperial.ac.uk/electrical-engineering/about/](http://www.imperial.ac.uk/electrical-engineering/about/).

### ABOUT THE MEng PROGRAMME

The Department offers both a three-year BEng programme and four-year integrated Master's MEng programme. Both degree programmes involve substantial group and individual project work. The MEng programme has the added benefit of an industrial placement or consultancy group project. In the final year of your programme you will be able to choose from a range of Master's level elective modules and gain further exposure to cutting-edge research problems in a wide range of information engineering topics.

The goal of this programme is to prepare you to become a high quality graduate who will innovate beyond current practice, whether in the electronic/electrical industry, information technology, research, or financial organisations. The EIE stream helps you understand the entire stack of modern networked computers, from the design and architecture of the CPU in a smart-phone, to the information theory and wireless protocols connecting it to the internet, and the operating systems and databases providing back-end support in the cloud.

This programme specification describes the academic path given in figure 1, below.

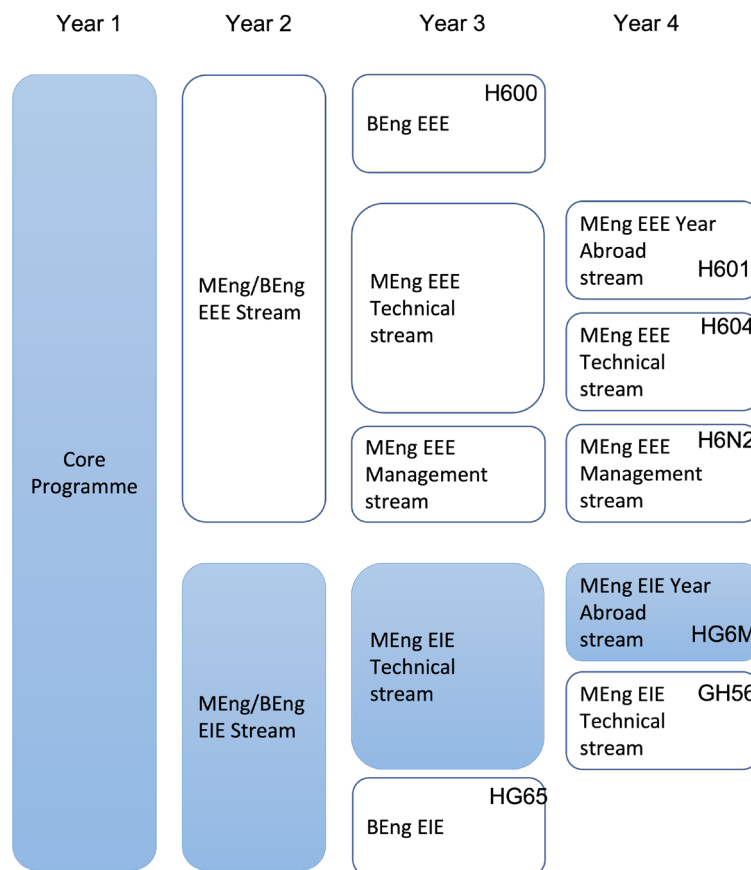


Figure 1: Programme structure with the different streams opening up after the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> year. The colour filled boxes relate to this programme specification. For the other streams, please refer to the appropriate programme specification.

After the first year you will have the option to transfer to the Electrical and Electronic Engineering (EEE) stream. Such a change of stream will be allowed under certain conditions as described in the relevant section. EEE focuses more on the physics behind electrical engineering whilst EIE is oriented towards information processing. This document describes the EIE stream.

In the first year you will be taught the fundamental principles in engineering. In the second year you will specialise more in information processing and computer engineering related fundamentals. In third and fourth year, you will be able to take advanced specialised topics, which will give you the most direct route to a specialist professional engineering career or a career in research and development. You will also have access to some modules offered by other engineering departments and some non-engineering topics such as management and entrepreneurship as well as languages and other modules offered by the Business School and Imperial Horizons.

In the third year, the MEng degree gives you the opportunity to be involved in either an industry-led consultancy project or an industrial placement. These modules allow you an opportunity to develop your professional engineering and transferable skills outside a purely academic setting. In the fourth year of the accredited MEng programme, you will be required to complete an Individual Project.

The year abroad stream will give you an opportunity to explore other countries and cultures whilst studying in one of our partner institutions. Access to the Year Abroad is competitive and based on language skills, academic performance and an interview with the Year Abroad Organiser. You may also need to successfully apply for a student visa. If you are not successful in obtaining a place on the year abroad programme, you will be allowed to proceed on the MEng stream programme.

### TRANSFERRING BETWEEN PROGRAMMES

All stream changes should be discussed with your personal tutor or the senior tutor and must be approved by the EIE Course Director.

### All Programmes

All programmes within the department have a common first year. It is therefore possible to transfer between the EIE and EEE streams up until the end of your first year. The approval of such transfer is based on your performance on

the related modules of the stream that you want to transfer to and an interview. To transfer from EEE to EIE you will have to perform well in ELEC40003 Digital electronics and computer architecture, and ELEC40004 Programming for engineers. To transfer from EIE to EEE you will have to perform well in ELEC40002 Analysis and design of circuits and ELEC40009 Topics in electrical engineering. You may also be invited to attend an interview that will assess your interest in the degree topic area and your motivation for wanting to change degree streams.

### **BEng to MEng**

Year two is common between the EIE MEng and EIE BEng. You can choose at any point up until end of year two to change between MEng and BEng. If you hold a Student Route visa you will need to contact the International Office before making any stream changes at this stage.-

To progress to year four of the MEng, you must have achieved a minimum of 50% overall (weighted average of years 1 to 3).

A transfer to the BEng stream will remove your opportunity to be involved in an industry-related placement within the degree structure.

### **ABOUT OUR TEACHING**

We use a variety of teaching methods that include large group lecture sessions, workshops, small group exercise sessions, as well as 3-to-1 tutorial sessions. Laboratory work is done in pairs with a partner from your year group. For group projects you will work in a larger team of 6-7 people.

Your learning will be supported by online tools such as blackboard for self-assessment and for-credit tests. Members of staff are experts in their field and bring their research and industrial expertise into the classrooms, especially in years 3 and 4.

Graduate and Undergraduate Teaching Assistants are involved in our tutor schemes, small group teaching and laboratory teaching.

The MEng programme has been designed based upon a number of key principles:

- **Competence in the fundamental principles of mathematics and electrical/electronic/ information engineering:** You will develop a firm grasp of the fundamental concepts and principles, be able to model complex systems analytically, and analyse and optimise these models.
- **Excellence in computer engineering:** You will acquire a high level of competence in both programming and in using the latest computing technologies, and be able to start creating the next generation of languages and hardware.
- **Pro-active learning:** You will learn how to learn by yourself and acquire the skill and discipline of lifelong learning.
- **Design Proficiency:** You will develop your ability to incorporate concepts into design of new products or processes, to provide innovations.
- **Development of professional and transferrable skills:** You will learn how to work in groups, develop your ability to communicate scientific/engineering ideas orally or in written form, and to develop general problem-solving skills.
- **Industrial perspectives:** You will be able to participate in an industrial based project via a six-month industrial placement, or a term long industry-led group consultancy project at the end of your third year. You will be encouraged to find industrial experience where possible.
- **Flexibility of provision:** We aim to provide you with a wide variety of options in the third and fourth years of the programme in order to allow you to specialise in specific areas of electronic/computer engineering.

### **Benefits of accreditation**

This programme is professionally accredited by the [Institution of Engineering and Technology \(IET\)](#) on behalf of the Engineering Council for the purposes of fully meeting the academic requirements for registration as a Chartered Engineer.

Achieving a professionally accredited integrated Master's degree (MEng) means that you have satisfied the first step to becoming a Chartered Engineer (CEng) in your chosen field by satisfying the educational requirements of professional registration. To gain Chartered status, you will need to demonstrate your ability to meet additional graduate level competences described in the [Engineering Council's UK-SPEC](#)

A CEng is a highly respected qualification earned by professionals working in engineering, which can lead to higher earning potential and better career prospects.

Professional registration also brings international recognition of your qualification, which is particularly useful when preparing for a career abroad.

## Learning Outcomes

At the end of the four year MEng programme you will be able to:

### **Science and Mathematics**

1. Explain and derive the fundamental concepts, mathematical abstractions, physical principles and applied techniques that underpin electronic and computer engineering, while being able to extrapolate your insight into related disciplines.
2. Solve familiar and unfamiliar problems using established methodologies as well as deriving, adapting and applying new methodologies that support innovation towards future developments in specialised fields.

### **Engineering Analysis**

3. Apply analytic principles and techniques, software engineering skills, as well as commercial software packages, to critically analyse, design, evaluate, simulate, and implement engineering systems incorporating both hardware and software, justifying approaches and recommending alternative ones in line with design criteria.
4. Interpret abstraction, critically evaluate related literature and justify the use of computational techniques, and be able to identify appropriate components to automate and optimise systems and processes.

### **Design**

5. Communicate, interact and work with peers and professionals from other disciplines, as well as non-specialist stakeholders, making decisions in complex and unpredictable situations, and manage work in terms of project plans, deliverables and costs.
6. Generate creative and innovative design for products, systems, components or processes to fulfil new needs.

### **Economic, legal, social, ethical and environmental context**

7. Explain the role of business processes in engineering, including the commercial, societal and legal framework within which industry operates and advise stakeholders on their implications.
8. Incorporate ethical, sustainability and environmental issues into your professional conduct, and integrate these into your engineering practice. Consider the security and risk aspects of a system, and recognise the benefits of EDI.

### **Engineering Practice**

9. Manage projects in both interdisciplinary and multidisciplinary environments by using relevant practical and laboratory skills on your own or as a member or leader in a team.
10. Design relevant systems, components or processes that meet specified industrial requirements and constraints while keeping within public health and safety, cultural, societal, and environmental constraints. Work proactively with others to formulate solutions to the implications of ethical dilemmas. Recognise the benefits of lifelong learning and plan your professional development.

### **Additional Learning Outcome specifically related to:**

- a) *The year abroad stream will enable you to:*  
Develop flexibility and resilience through adapting to sudden changes in lifestyle/culture and perspectives in academic education.
- b) *The industrial placement will enable you to:*  
Formulate the need for rationalised compromises required to deliver reliable solutions within the allocated timeframe and cost in an industrial context.

**Exit awards** are only granted at the discretion of the Board of Examiners in line with College Regulations. None of the exit awards are accredited. Should you wish to pursue recognition as a professional engineer after leaving without an accredited degree, a full review of your academic history and possibly further study will be necessary to support your application for professional registration.

On completion of Year Three (BEng Electronic and Information Engineering exit award) you will be able to:

### **Science and Mathematics**

1. Explain the fundamental concepts, mathematical abstractions, physical principles and applied techniques that underpin electronic and computer engineering, while having an insight into related disciplines.
2. Solve familiar and unfamiliar problems using established methodologies as well as deriving, adapting and applying new ones with minimal guidance.

### **Engineering Analysis**

3. Apply analytic principles and techniques, software engineering skills, as well as commercial software packages, to critically analyse, design, implement and simulate engineering systems incorporating both

hardware and software, justifying approaches and recommending alternative ones in line with design criteria.

4. Interpret abstraction and justify the use of computational techniques, and be able to identify appropriate components to automate and optimise systems and processes.

#### **Design**

5. Communicate, interact and work with peers and professionals from other disciplines, as well as non-specialist stakeholders, making decisions in complex situations, and manage work in terms of project plans, deliverables and costs.

#### **Economic, legal, social, ethical and environmental context**

6. Explain the role of business processes in engineering, including the commercial, societal and legal framework within which industry operates and advise stakeholders on their implications.
7. Incorporate ethical, sustainability and environmental issues into your professional conduct, and integrate these into your engineering practice.

#### **Engineering Practice**

8. Manage projects in both interdisciplinary and multidisciplinary environments by using relevant practical and laboratory skills on your own or as a member in a team.
9. Design relevant systems, components or processes that meet specified industrial requirements and constraints while keeping within public health and safety, cultural, societal, and environmental constraints.

On completion of Year Two (Diploma in Higher Education exit award) you will be able to:

#### **Science and Mathematics**

1. Explain the fundamental concepts, mathematical, physical principles and techniques that underpin electronic and computer engineering.
2. Solve familiar problems using established methodologies as well as deriving, adapting and applying new ones with guidance.

#### **Engineering Analysis**

3. Apply software engineering skills to analyse, design, implement and simulate electronic engineering systems, justifying approaches in line with design criteria.

#### **Design**

4. Communicate, interact and work with peers and professionals from other disciplines and manage work in terms of project plans, deliverables and costs.

#### **Economic, legal, social, ethical and environmental context**

5. Explain the role of business processes in engineering, including the commercial, societal and legal framework within which industry operates and advise stakeholders on their implications.
6. Have an insight into ethical, sustainability and environmental issues related to your professional conduct.

#### **Engineering Practice**

7. Manage projects by using relevant practical and laboratory skills on your own or as a member in a team.

On completion of Year One (Certificate in Higher Education exit award) you will be able to:

#### **Science and Mathematics**

1. Describe and recall the fundamental concepts, mathematical, physical principles and techniques that underpin electronic and information engineering.
2. Solve familiar problems using established methodologies with guidance.

#### **Engineering Analysis**

3. Apply analytic principles and techniques, software engineering skills to analyse and simulate electronic engineering systems, recognising the approaches needed in line with design criteria.

#### **Design**

4. Communicate, interact and work with peers and manage work in terms of project plans, deliverables and costs.

#### **Economic, legal, social, ethical and environmental context**

5. Recognise the need for a commercial, societal and legal framework for business processes in engineering.
6. Have an insight into ethical, sustainability and environmental issues related to your professional conduct.

#### **Engineering Practice**

7. Manage projects by using relevant practical and laboratory skills on your own or as a member in a team.

The Imperial Graduate Attributes are a set of core competencies that we expect students to achieve through completion of any Imperial College degree programme. The Graduate Attributes are available at:

## Entry Requirements

Academic Requirement	<p>Our minimum entry standard for 2023 entry is A*A*A or A*AAA overall, to include</p> <p>A* in Mathematics A*/A in Physics (A* is required if applying with three A levels) A in a third and/or fourth subject</p> <p>Recommended subjects: Further mathematics (strongly encouraged), Chemistry, Computer Science, Computing, Design and Technology, Electronics.</p> <p>Students taking English exam board science A levels will be required to pass the practical endorsement. For non A-level students, a comparable qualification recognised by the College – e.g. for International Baccalaureate: a minimum grade of 40 overall with 7 in both Mathematics and Physics at higher level.</p> <p>For further information on entry requirements, please go to <a href="http://www.imperial.ac.uk/study/apply/undergraduate/entry-requirements/">www.imperial.ac.uk/study/apply/undergraduate/entry-requirements/</a></p>
Non-academic Requirements	NA
English Language Requirement	<p><u>Higher requirement</u> Please check for other <u>Accepted English Qualifications</u></p>
Admissions Test/Interview	<p>Admissions Tutors consider all the evidence available during our rigorous selection process and the College flags key information providing assessors with a more complete picture of the educational and social circumstances relevant to the applicant. Some applicants may be set lower offers and some more challenging ones.</p> <p>If your application passes initial screening, you'll be invited to take a 60-minute, online admissions test.</p> <p>The test will be held in November (for applications received by 15 October) and in February (for all other applications).</p> <p>The test will mostly be based on areas in mathematics and physics which you study in your final years of secondary school.</p> <p>We look holistically at candidates' UCAS applications and admissions test scores when deciding who to invite for interview.</p> <p>Interviews will be held with academic staff between November and March.</p>

The programme's competency standards documents can be found at:  
[www.imperial.ac.uk/electrical-engineering/study/undergraduate/](http://www.imperial.ac.uk/electrical-engineering/study/undergraduate/)

## Learning & Teaching Approach

### Teaching Delivery Methods

Your course material will be delivered in different ways, including large cohort lectures in lecture theatres, team-based-learning in smaller groups, flipped classroom approaches, workshops, video recordings for online learning and laboratory work in software, hardware and embedded systems. In addition, tutorials in groups of 3-4 students will support you in analysing your progress and allow you to discuss problems in a more personal environment. Work in

the laboratories is done in small teams and will teach you experimental skills, data management and how to work with other people. Team-based-learning will focus mainly on developing analytical skills in solving both well defined as well as open-ended engineering problems. You will be expected to carry out preparation work before lectures and laboratories. Revision of material is a continuous process and keeping up with new contents is key to understanding and remembering engineering concepts and how they link together.

### **Design and build projects**

The aim of the laboratories is to add a practical aspect to the taught modules, to teach you experimental skills, including the safe use of equipment and how to choose components and encourages you to develop robust data recording and analysis skills. Design and build projects aim to bring all the taught concepts and the hard- and software skills together in order to deal with more complex systems that solve an engineering problem supported by a team of 5-8 students. These projects will also allow you to improve your team working skills together with obtaining expertise in management of time and cost. The design and build project will be mainly student-driven in order to allow you liberty in personal development and self-paced assimilation of contents.

There are group projects in the first and second years. In the third year you will have a choice between a group project as a consultancy team for an industry defined problem or an individual industrial placement. In your fourth year you showcase your imagination, originality and independent engineering expertise in a substantial final year project.

### **Professional and transferable skills**

Throughout your programme, you will also attend workshops designed to develop transferable skills (e.g. career development, team building, ethical behaviour, and report-writing and presentation skills). These will be complemented by options to develop individual interdisciplinary interests by choosing electives in humanities, business and management studies and other STEM subjects from across the College. Professional Engineering is a topic that is integrated in all projects (group, individual and industrial) and is assessed by a Professional Portfolio that needs to be completed in the fourth year.

### **Independent learning**

Independent study is an important part of higher education and we expect you to invest at least two to three hours of independent study for every contact hour. E-learning tools, books in the library and online digital information will support independent study. You are advised to read widely around the topic to expand your knowledge. The aim of independent study is not only to assimilate taught material but also to become an independent learner who, after graduation, can take responsibility for your future learning and development.

### **Industrial Experience**

In the third year of your studies, you will have the opportunity to undertake a 6-month industrial placement, or to work on campus on an Industry-led group project for three months. The industrial placement runs between April to September and provides you with the opportunity to work within a company to apply your knowledge to real-world problems or projects. The industry-led group project runs from April till end of June, and you will have the opportunity to work on a project defined by our industrial partners.

### **Overall Workload**

Your overall workload consists of face-to-face sessions and independent learning. While your actual contact hours may vary according to the optional modules you choose to study, the following gives an indication of how much time you will need to allocate to different activities at each level of the programme. At Imperial, each ECTS credit equates to an expected total study time of 25 hours. Of course, assimilation of new topics is different for everyone and therefore some students will need more or less time to achieve the same learning outcomes.

#### Year 1 and 2:

The ECTS allocated to each module are defined in the programme structure. Normally for 5 ECTS you will have 20 hours of lectures, 10 hours of team based learning, and 20 hours of laboratories. For every hour of face-to-face support you will be expected to spend two to three hours in self-study supported by videos, online self-assessment, course notes and lecture handouts. This estimation includes tests and exam preparation time. For the laboratory, preparation/revision time will be less but you are expected to spend an hour of preparation for each hour of lab. Preparation for labs will include engaging in the virtual labs, watching the support videos in your own time and reading around the topic. The Design Projects run in the summer term. Timetabled hours will be allocated to Engineering Practice within the project module. Access to laboratories will be timetabled. You will receive help to get organised and how to manage the time spent on the project with the members of your team. A member of staff will follow and guide your progress but will not micromanage. We estimate that you will have to spend about 200 hrs on the project. The ratio of self-study to face-to-face time will increase from year 1 to year 4 since we expect you to develop towards independent learning.



### Year 3

Normally, EEE modules have 5 ECTS with approximately 20 hours of face-to-face lecture time.

Exam assessed modules usually have extra allocated hours for revision. Video recordings support a move to a more self-learning style. Support outside the timetable is available upon request and is delivered by both the academic lead as well as the Graduate Teaching Assistants (GTAs). You are expected to spend a significant amount of time in self-study – approximately 163 hours/module.

Coursework-assessed modules are mainly carried out in groups, and GTA are available to support you with the hardware or software labs for the coursework. It is expected that a group spends an additional 163 hour/module on coursework outside the face-to-face time. Lab technicians and GTAs will be able to help you understand difficult concepts and implementations. To be successful with multiple coursework-assessed modules that run in parallel, good time management skills will be required to fulfil your obligations to deliver the coursework in time.

You will have the opportunity to carry out either a 6 month Industrial Placement or a 3 month group project proposed by one of our industrial partners. You will complete a Professional Competencies module in your 4th year for 5 ECTS. If you took the Industrial Placement module in 3rd year, your work experience is recognised by an enhanced version of this module (20 ECTS).

In year 3 you will have access to elective modules in the Department of Computing (DoC). Please read their programme specifications for more details as the DoC modules might differ from the approach in the Department of Electrical and Electronic Engineering. In general DoC modules have a similar workload, and also provide similar support. You will also take a module from our I-Explore programme. These are modules in the areas of humanities, languages and business that are offered across the whole College. I-Explore modules are designed to broaden your perspectives, give new context to your disciplinary knowledge and allow you to share your expertise for the benefit of society.

### Year 4 abroad

In year 4, you will follow the programme agreed with the partner institution and discuss the modules you will take with the Year Abroad Organiser. You will be expected to establish a clear study programme that maps the learning outcomes of the year abroad choices to the UK Spec requirements. The year abroad organiser will help in this endeavour. This approach will ensure accreditation conditions are fulfilled.

A further 30 ECTS will be required for a Bologna-compliant degree. This can be achieved by completing ELEC70107 Professional Portfolio and Industrial Placement (20 ECTS) and writing a Cultural Dissertation (10 ECTS). The Cultural Dissertation carries ECTS but does not contribute to the marks weighting of the final year.

## **Assessment Strategy**

### Assessment Methods

A variety of formative and summative assessment methods are utilised in this programme. Formative assessment will be conducted through different techniques, including online self-assessment, key skills assessments, tutorial sessions and other approaches that might evolve based on the developments in learning and teaching technology. Summative assessment (assessments that evaluate your understanding of engineering concepts and gives the department an insight into how well you master these). Summative assessments count towards your final degree and offer opportunities for you and your instructors to assess you level of understanding and progress on a module.

You can expect a variety of different types of assessment methods:

- On-line tests
- Written coursework
- Group working
- Hardware and software demonstrators
- Written examinations
- Oral presentations

In years 1 and 2, there is a programme of continuous assessment which is centred around mid-term exams and practical laboratory exercises. The majority of the written examination are held at the beginning of the summer term. In years 3 and 4, you will have the option to select the modules that you want to study, and the number and type of their assessments depend on your elective module choices. In year 3, written examinations for the autumn term modules takes place in December. Spring term modules are assessed either by coursework, or written exam at end of term. This allows you to start your 6-months Industrial Placement in end of March,

Please refer to Department of Computing programme specifications for more details on the modules that they offer as they might differ from the approach in the Electrical and Electronic Engineering Department.

**4<sup>th</sup> year Abroad**

The assessment methods, module weighting and approach towards the final year project will depend on the procedures in the host institution. Since different institutions have slightly different approaches towards their final year, some flexibility in expectations is needed. This will be discussed before the final decision to go abroad is made.

**Balance of assessment**

The following are approximate percentages based on a typical pathway through the course.

	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year
Coursework	15	13	43	(depends on host institution)
Exam	65	65	54	(depends on host institution)
Practical	20	22	3	(depends on host institution)

**Academic Feedback Policy**

Formative feedback

Will be via online self-assessment opportunities, group-based-learning approaches (in class and online), comments on reports and portfolios, in-class module feedback and feedback via tutorials.

Laboratory demonstrators will be available for help and feedback during the laboratory session.

Summative feedback

Will be via online assessment, team-based-learning approaches (in class and online), automated testing of code, comments on reports and portfolios and in-class module test feedback. Feedback on exams is in the form of grades and annotated example answers that will be made available after the September Examiners' Meeting. Summative feedback on the presentations will be provided during the presentation session.

Important note: You will take some of your elective modules from the Department of Computing. Please read their programme specifications for more details as they might differ from the approach in the Electrical and Electronic Engineering Department.

The College's Policy on Academic Feedback and guidance on issuing provisional marks to students is available at: [www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/](http://www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/)

Year 4 Abroad

Feedback will be according to the policies and procedures of the host institution.

**Re-sit Policy**

The College's Policy on Re-sits is available at: [www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/](http://www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/)

**Mitigating Circumstances Policy**

The College's Policy on Mitigating Circumstances is available at: [www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/](http://www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/)

**Additional Programme Costs**

This section should outline any additional costs relevant to this programme that are not included in students' tuition fees.

Description	Mandatory/Optional	Approximate cost
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Laptop computer	Optional	The recommendation is that you bring your own laptop to join the bring-your-own-devices (BYOD) scheme. The Department runs a free laptop loan scheme for those without laptop or those who forgot to bring their laptop to College.
Computer software	Optional	The College/Department gives you access to the required software that support the modules. In those cases where external GPU time is needed, the department runs a refund scheme.
Study abroad	Mandatory	Although the fees to study abroad are covered by interuniversity agreements, you are advised to consider the other costs of studying abroad such as e.g. visa, travel, international health insurance and accommodation. Find more info in <u>etc.</u>
<p>You will need to consider the costs involved with placements. If studying or working abroad as part of your programme, costs will vary with destination. Information on the types of costs which may be incurred can be found in the Placements Abroad Handbook which is available at <a href="http://www.imperial.ac.uk/placements/information-for-imperial-college-students/">www.imperial.ac.uk/placements/information-for-imperial-college-students/</a></p>		

**Important notice:** The Programme Specifications are the result of a large curriculum and pedagogy reform implemented by the Department and supported by the Learning and Teaching Strategy of Imperial College London. The modules, structure and assessments presented in this Programme Specification are correct at time of publication but might change as a result of student and staff feedback and the introduction of new or innovative approaches to teaching and learning. You will be consulted and notified in a timely manner of any changes to this document when implemented in session. Updated versions will be on-line at the start of the academic year.

Programme Structure <sup>1</sup>					
Year 1 – FHEQ Level 4 You study all core modules.					
Code	Module Title	Core/ Compulsory/ Elective	Group*	Term	Credits
ELEC40012	Mathematics 1	Core		Autumn- Spring	15
ELEC40009	Topics in Electrical Engineering	Core		Autumn- Spring	7.5
ELEC40002	Programming for Engineers	Core		Autumn- Spring	10
ELEC40003	Analysis and Design of Circuits	Core		Autumn- Spring	10
ELEC40004	Digital and Computer Architecture	Core		Autumn- Spring	10
ELEC40006	Electronics Design Project 1	Core		Summer	7.5
Credit Total					60
Year 2 - FHEQ Level 5 You study all core modules.					
Code	Module Title	Core/ Compulsory/ Elective	Group	Term	Credits
ELEC50011	Mathematics for Engineers	Core		Autumn	5
ELEC50006	Discrete Mathematics	Core		Autumn	5
ELEC50010	Instruction Architectures and Compilers	Core		Autumn- Spring	10
ELEC50014	Software Systems	Core		Autumn	5
ELEC50009	Information Processing	Core		Spring	5
ELEC50013	Signals and Systems	Core		Autumn	5
ELEC50002	Communications	Core		Spring	7.5
ELEC50004	Control Systems	Core		Spring	7.5
ELEC50015	Electronics Design Project 2	Core		Summer	10
Credit Total					60

<sup>1</sup> **Core** modules are those which serve a fundamental role within the curriculum, and for which achievement of the credits for that module is essential for the achievement of the target award. Core modules must therefore be taken and passed in order to achieve that named award. **Compulsory** modules are those which are designated as necessary to be taken as part of the programme syllabus. Compulsory modules can be compensated. **Elective** modules are those which are in the same subject area as the field of study and are offered to students in order to offer an element of choice in the curriculum and from which students are able to select. Elective modules can be compensated.

**Year 3 - FHEQ Level 6**

**You must choose at least 3 modules from group A+B, and at least 2 computing modules from group DoC. In total you must take 7 modules from the combined A+B+DoC group. You must take one iExplore module. All students must choose 1 module from group P.**

Code	Module Title	Core/ Compulsory/ Elective	Group	Term	Credits
ELEC60021	Mathematics for Signals and Systems	Elective	A	Autumn	5
ELEC60004	Machine Reasoning	Elective	A	Autumn	5
ELEC60005	Biomedical Electronics	Elective	A	Autumn	5
ELEC60008	Control Engineering	Elective	A	Autumn	5
ELEC60010	Digital Signal Processing	Elective	A	Autumn	5
ELEC60006	Communication Networks	Elective	A	Autumn	5
ELEC60019	Machine Learning	Elective	A	Autumn	5
ELEC60002	Statistical Signal Processing and Inference	Elective	B	Spring	5
ELEC60009	Deep Learning	Elective	B	Spring	5
ELEC60011	Digital Systems Design	Elective	B	Spring	5
ELEC60013	Embedded Systems	Elective	B	Spring	5
ELEC60015	High Level Programming	Elective	B	Spring	5
ELEC60031	Principles of Classical and Modern Radar Systems	Elective	A	Autumn	5
ELEC60025	Real Time Digital Signal Processing	Elective	B	Spring	5
ELEC60030	Robotic Manipulation	Elective	B	Spring	5
ELEC60033	Electric Vehicle Technologies	Elective	B	Spring	5
COMP60001	Advanced Computer Architecture	Elective	DoC	Autumn	5
COMP60012	Introduction to Machine Learning	Elective	DoC	Spring	5
COMP60016	Operations Research	Elective	DoC	Autumn	5
COMP60020	Simulation and Modelling (not running in 2023-24)	Elective	DoC	Autumn	5
COMP60023	Type Systems for Programming Languages	Elective	DoC	Autumn	5
COMP60029	Data Processing Systems	Elective	DoC	Spring	5
COMP60006	Computer Vision	Elective	DoC	Spring	5
COMP60008	Custom Computing	Elective	DoC	Spring	5
COMP60009	Distributed Algorithms	Elective	DoC	Spring	5

COMP60005	Graphics	Elective	DoC	Spring	5
COMP60015	Network and Web Security	Elective	DoC	Spring	5
COMP60019	Robotics (not running in 2023-24)	Elective	DoC	Spring	5
COMP60017	System Performance Engineering	Elective	DoC	Spring	5
	I-Explore	Compulsory		Autumn or Spring	5 or 7.5
ELEC60014	Group Consultancy Project	Elective	P	Summer	20
ELEC60016	Electrical Engineering Industrial Placement	Elective	P	Summer	20
Credit Total					60 or 62.5

<b>Year 4 - FHEQ Level 7</b> <b>You must take either ELEC70107 Professional Competencies with Industrial Experience or ELEC70108 Professional Competencies Portfolio, and all other core and compulsory modules.</b> <b>The final year is spent at a University outside of the UK</b>					
Code	Module Title	Core/ Compulsory/ Elective	Group	Term	Credits
ELEC70041	Electrical and Information Engineering Year Abroad	Core	N/A	Autumn- Summer	60
ELEC70108	Professional Competencies Portfolio	Compulsory*		Autumn- Summer	5
ELEC70107	Professional Competencies with Industrial Experience	Compulsory*		Autumn- Summer	20
ELEC70104	Cultural Dissertation	Elective		Autumn- Summer	10
Credit Total					65 or 90

**Important notice:** The range of electives available in a given year is dependent on staff availability (influenced by sabbaticals, retirements and resignations). Where possible, you will be given notice of which options are available to you ahead of making module choices.

## Progression and Classification

### Progression

In order to progress to the next level of study, you must have passed all modules in the current level of study at first attempt, at resit or by a compensated pass.

The overall weighted average for each year must be 40.00%, including where a module(s) has been compensated, in order for you to progress to the next year of the programme.

In order to progress to the 4<sup>th</sup> year of the MEng degree you must have achieved a minimum of 50.00% in the weighted total mark over 3 years.

### Compensation

Compensation is the practice of allowing marginal failure of one or more modules, on the basis of good overall academic performance. Core modules cannot be compensated.

### Classification

The marks from modules in each year contribute towards the final degree classification.

In order to be considered for an award, you must have achieved the minimum number of credits at the required levels prescribed for that award and met any programme specific requirements as set out in the Programme Specification.

Your classification will be determined through:

- i) Aggregate Module marks for all modules
- ii) Year Weightings

For this award the weightings are:

Year 1	7.50%
Year 2	20.00%
Year 3	36.25%
Year 4	36.25%

The College sets the class of undergraduate degree that may be awarded as follows:

First	70.00% or above for the average weighted module results
Upper Second	60.00% or above for the average weighted module results
Lower Second	50.00% or above for the average weighted module results
Third	40.00% or above for the average weighted module results

Please find the full Academic Regulations at [www.imperial.ac.uk/about/governance/academic-governance/regulations/](http://www.imperial.ac.uk/about/governance/academic-governance/regulations/). Please follow the prompts to find the set of regulations relevant to your programme of study.

## Programme Specific Regulations

As an accredited degree, students on this programme are subject to the standards set by the Engineering Council in relation to compensation: a maximum of 15 ECTS credits can be compensated across the entire programme.

Policies and regulations may vary for students on a year abroad. You are encouraged to familiarise yourself with the relevant policies and regulations which will underpin your studies while abroad before you go. If you have any questions, please talk to your host institution or your home departmental contact.

## Supporting Information

The Programme Handbook is available at: [www.imperial.ac.uk/electrical-engineering/internal/current-students-course-handbook/undergraduate-handbook/](http://www.imperial.ac.uk/electrical-engineering/internal/current-students-course-handbook/undergraduate-handbook/).

The Module Handbook is available at: [www.imperial.ac.uk/electrical-engineering/internal/current-students-course-handbook/undergraduate-handbook/](http://www.imperial.ac.uk/electrical-engineering/internal/current-students-course-handbook/undergraduate-handbook/).

The College's entry requirements for postgraduate programmes can be found at: [www.imperial.ac.uk/study/apply/postgraduate-taught/entry-requirements/](http://www.imperial.ac.uk/study/apply/postgraduate-taught/entry-requirements/)

The College's Quality & Enhancement Framework is available at: [www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance](http://www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance)

The College's Academic and Examination Regulations can be found at: [www.imperial.ac.uk/about/governance/academic-governance/regulations](http://www.imperial.ac.uk/about/governance/academic-governance/regulations)

Imperial College is an independent corporation whose legal status derives from a Royal Charter granted under Letters Patent in 1907. In 2007 a Supplemental Charter and Statutes was granted by HM Queen Elizabeth II. This Supplemental Charter, which came into force on the date of the College's Centenary, 8th July 2007, established the College as a University with the name and style of "The Imperial College of Science, Technology and Medicine".

[www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/](http://www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/)

Imperial College London is regulated by the Office for Students (OfS) [www.officeforstudents.org.uk/advice-and-guidance/the-register/](http://www.officeforstudents.org.uk/advice-and-guidance/the-register/)

**This document provides a definitive record of the main features of the programme and the learning outcomes that a typical student may reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities provided. This programme specification is primarily intended as a reference point for prospective and current students, academic and support staff involved in delivering the programme and enabling student development and achievement, for its assessment by internal and external examiners, and in subsequent monitoring and review.**

## Modifications

Description	Approved	Date	Paper Reference
Addition of new modules: Principles of Classical and Modern Radar Hardware and Software Verification	Yes - DTC	10/2019	
Clarification of 1 <sup>st</sup> year module assessment	Yes - DTC	11/2019 & 12 Feb 2020	
Addition of new modules for next academic year (2020-21): Self Organising Multi Agent Systems Hardware and software verifications Re-introduced: High Performance Computing for Engineers Artificial Intelligence Name change: "Discrete-time Systems and Computer Control" to "Digital Control Systems" Withdrawn: Estimation and Fault Detection module Selected topics in Computer Vision	Yes - DTC	09/2019 02/2020	
Major change to module organisation in year 1.	Yes - DTC	12 Feb 2020	



Name change 4 <sup>th</sup> year module: System Identification to Systems Identification and Learning	Yes - DTC	17/03/20	
Adapt Industrial placement to that of DOC	Chairs action		
All other modifications are related to small changes in word use in text and re-organisation of 4 <sup>th</sup> year modules between autumn and spring term.		July 2020	
1 <sup>st</sup> year: ECTS for ELEC50010 and ELEC50011 originally mis-assigned. Swopped around	DUGS	March 2021	
Programme structure: list of modules updated	DUGS	July 2021	
Overall LOs updated in line with AHEP4. Entry requirements updated. List of modules updated.	DUGS	January 2023	