

Programme Specification

MSc Electronic Engineering (2017-18)

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Mode of study	Full Time
Duration in years	1 Year
Accreditation details	IET accreditation sought
Final award	Master of Science (MSc)
Name of award	Electronic Engineering
Interim Exit awards	Postgraduate Diploma (PgDip) Postgraduate Certificate (PgCert)
FHEQ level of final award	Level 7
UCAS code	N/A
QAA Subject Benchmark or other external reference	The UK Quality Assurance Agency's Framework for Higher Education Qualifications (FHEQ) and Subject Benchmark Statement (Engineering Masters) The IET Learning Outcomes Handbook The Engineering Council UK-SPEC
Programme Lead	Dr Frédéric Gardès
Date specification was written	20/11/2016
Date Programme was validated	30/01/2017
Date specification last updated	07/12/2017

Programme Overview

Brief outline of the programme

This programme is a portfolio masters degree, enabling you to further your specialist knowledge of areas such as Microelectronics Systems Design, Embedded Systems, Micro and Nano Technologies, Photonic Technologies, and Wireless Communications. This programme is taken mainly by international students with a first degree in electronic engineering (or in a closely related subject with a significant electronic engineering content) and builds on our successful pre-existing specialist masters. The modules which comprise this masters degree cover state of the art techniques, technologies and industry-standard supporting tools, and their application in solving complex problems to meet emerging economic and social needs.

In the taught element of this programme you can select a range of options across these specialist areas in order to build your own degree in a more flexible way. You will also have the opportunity to prepare yourself for your individual research project with a dedicated project preparation module. The contact hours and the extent of group work will vary depending on your module choices; full information is provided in individual module profiles.

Special features of the programme

Southampton is recognised to be internationally leading in the areas mentioned above, and specialist modules are taught by staff involved in leading edge research. Students are therefore exposed to the most up to date thinking, current research problems, and state of the art techniques, technologies and tools.

Learning and teaching

The range of teaching and learning methods is explained in the following sections covering programme learning outcomes.

Assessment

The range of assessment methods used to enable students to demonstrate the achievement of intended learning outcomes is explained in the following sections.

Please note: As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration; however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our [Disclaimer](#) to see why, when and how changes may be made to a student's programme.

Programmes and major changes to programmes are approved through the University's programme [validation process](#) which is described in the University's Quality handbook.

Educational Aims of the Programme

The aims of the programme are to:

- 1) Provide you with advanced knowledge of principles and methodologies in specialist areas of electronic engineering such as Microelectronics Systems Design, Embedded Systems, Micro and Nano Technologies, Photonic Technologies, and Wireless Communications
- 2) Develop your research skills applicable to a career in industry or academia
- 3) Stimulate your interest in applications of electronic engineering, and develop your ability to act as an ambassador for the discipline

Programme Learning Outcomes

Knowledge and Understanding

Having successfully completed this programme you will be able to demonstrate knowledge and understanding of:

- A1 Key concepts of electronic engineering
- A2 Advanced concepts in specialist areas of electronic engineering such as Microelectronics Systems Design, Embedded Systems, Micro and Nano Technologies, Photonic Technologies, and Wireless Communications
- A3 State of the art techniques, technologies and tools used in these specialist areas
- A4 Methods of design, realisation and testing used in these specialist areas
- A5 Applicable methods of research and enquiry within the discipline

Teaching and learning methods

A1-A5: Most modules consist of a combination of lectures, small group teaching, practical work, directed reading and coursework assignments. At the end of the taught part of the programme you will undertake an individual project associated with a research group. Small group teaching, including all practical work, and the individual project accommodate different learning styles. One-on-one tutorials can support full-class lectures, when required.

Assessment methods

Testing of the knowledge base is through a combination of unseen written examinations and assessed coursework in the form of problem solving exercises, laboratory reports with literature review components, design exercises, and individual and small-group projects.

Subject Specific Intellectual and Research Skills

Having successfully completed this programme you will be able to:

- B1 Specify, design and realise advanced and specialised electronic systems and devices
- B2 Test and evaluate the performance of such systems and devices
- B3 Analyse problems to determine appropriate methods of design, testing and evaluation
- B4 Find, read, understand and explain literature related to advanced and specialised areas of electronic engineering, including scientific publications, industrial documentation, standards, ethical, legal and environmental guidance
- B5 Formulate a research project involving an advanced and specialised electronic engineering system, device or methodology, using appropriate state of the art techniques, technologies and tools

Teaching and learning methods

B1-B4: Most modules consist of a combination of lectures, small group teaching, and practical work including advanced design and analysis tools, directed reading and coursework assignments, which can include a literature review. B4, B5: The Project Preparation module and the Individual Project itself concern the

formulation of a research project. Small group teaching, including all practical work, and the individual project accommodate different learning styles. One-on-one tutorials can support full-class lectures, when required.

Assessment methods

B1-B5: Testing of the subject specific intellectual and research skills is through a combination of unseen written examinations and assessed coursework in the form of problem solving exercises, laboratory reports with literature review components, design exercises, and individual and small-group projects.

B4: The Project Preparation module and the dissertation from the MSc Project include a significant literature survey and peer review, and have assessment criteria related specifically to these skills.

B5: The Project dissertation is centrally focussed on assessing research and development skills.

Transferable and Generic Skills

Having successfully completed this programme you will be able to:

- C1 Use conventional and electronic indexing and search methods to find technical information
- C2 Present technical information concisely in written and verbal forms to a range of audiences
- C3 Work in a pair or in a small group on a given task, managing your own contribution and the overall task
- C4 Work independently on a significant research project, managing time and risk in an effective manner
- C5 Recognise legal and ethical issues of concern to business, professional bodies and society, and follow relevant guidelines to address these issues

Teaching and learning methods

A number of modules have a significant coursework element. This can range from design work through to presentations resulting from directed reading. The individual project includes independent research, project management and report writing.

C1-C3: Most modules include small group teaching, practical work with one or more lab partners, directed reading and coursework assignments with a literature review component. The Project Preparation module includes project management and the delivery of a project plan via a presentation. Small group teaching, including all practical work, and the individual project accommodate different learning styles.

C4: The individual project includes independent research and report writing.

C5: Legal, ethical and professional issues are covered in the Project Preparation module.

Assessment methods

Coursework is generally assessed through written reports. The individual project is assessed by a dissertation of up to 15,000 words. The Project Preparation module is assessed via a literature review, as well as written and presentation versions of the project plan.

Subject Specific Practical Skills (optional)

Having successfully completed this programme you will be able to:

- D1 Use specialist tools for the design, realisation and analysis of electronic systems and devices

Teaching and learning methods

D1: Most modules include practical work, involving use of industry-standard specialised tools for the design, realisation and analysis of electronic systems and devices. These specialised tools are taught within the modules, except for MATLAB. Students without prior experience of MATLAB should not select the wireless communications or signal processing modules, or should participate in MATLAB tutorials of an additional module during the first weeks of semester 1.

Assessment methods

Assessment is based on coursework in the form of technical reports, device designs and realisation, software designs and implementation, and also the MSc dissertation.

Disciplinary Specific Learning Outcomes (optional)

n/a

Graduate Attributes (not required for PG programmes)

n/a

Programme Structure

Typical course content

This programme consists of eight taught modules, each worth 7.5 ECTS credits points and an individual research project worth 30 ECTS credit points. In the compulsory semester 2 module Project Preparation you will undertake appropriate preparatory study for this research project, and you will also examine ethical and legal issues around professional practice. You can choose seven modules (four options in semester 1 and three options in semester 2) from a wide range of topics covering advanced and specialised aspects of Microelectronics Systems Design, Embedded Systems, Micro and Nano Technologies, Photonic Technologies, Wireless Communications, and related areas, allowing you to tailor the structure to suit your own interests.

Programme details

There are a number of compulsory and optional taught modules. Many of these modules have co-requisites or pre-requisites. Most modules are shared with our Master of Engineering programmes in Electronic Engineering and the specialist MSc programmes we run. Most options are at level 7 (masters). Four options are at level 6, however: ELEC3202, ELEC3203, ELEC3207, and ELEC3221. At most two of these may be taken thereby giving a maximum of 15 ECTS credits below the level of the award. As there are a large number of options, students will be given generic and individual advice to help them make an appropriate selection, based on their background and interests. It is possible to concentrate on a specific stream: micro/nanoelectronics (A), micro/nanotechnology (B), communications (C), or optoelectronics (D), but this is not required. The communications (C) stream requires experience with MATLAB.

It should be noted that it may not be possible to run some optional modules if the number of students registered on the module is very small. It should also be noted that optional module choice can be restricted by the University Timetable, which varies from year to year: some optional modules may clash with other optional or compulsory modules. Please be aware that many modules are shared between different cohorts; the class size depends on cohort size, which varies from year to year.

In semester 1, at least one of the following modules should be chosen: ELEC6201, ELEC6217, ELEC6236, OPTO6007. Each of these represent an important module for one of the streams. In semester 2, ELEC6211 (Project Preparation) is compulsory. Some semester 1 modules have co-requisites and all semester 2 modules have pre-requisites.

The following is the normal pattern of study for a full-time student, completing the programme within 12 calendar months:

Semester 1: Four modules, including at least one of: ELEC6201, ELEC6217, ELEC6236, OPTO6007. Examinations are held in January.

Semester 2: Four modules, including ELEC6211. Examinations are held in May/June.

Summer: You will undertake an individual research project lasting up to 14 weeks, which is assessed by a 15,000-word dissertation.

The programme structure is shown in the following tables:

Semester 1 (total of 60 credits)

Type	Code	Title	Level	-requisites		ECTS	Stream
				Pre-	Co-		
optional*	ELEC6236	Digital System Design	7			7.5	A
optional	ELEC3221	Digital IC and Systems Design	6			7.5	A
optional	ELEC6237	Secure Hardware Design	7		ELEC6236	7.5	A
optional	ELEC3207	Nanoelectronic Devices	6			7.5	A
optional*	ELEC6201	Microfabrication	7			7.5	B
optional	ELEC6203	Introduction to MEMS	7		ELEC6201	7.5	B
optional	ELEC6204	Microfluidics and Lab-on-a-Chip	7		ELEC6201	7.5	B
optional	ELEC6205	Bionanotechnology	7		ELEC6201	7.5	B
optional*	ELEC6217	Radio Communications Engineering	7			7.5	C
optional	ELEC3203	Digital Coding and Transmission	6			7.5	C
optional	ELEC6218	Signal Processing	7			7.5	C
optional*	OPTO6007	Introduction to Silicon Photonics	7			7.5	D
optional	OPTO6008	Optical Fibre Technology I	7			7.5	D

* at least one of these modules should be chosen

The interim exit award after semester 1 can be a Postgraduate Certificate.

Semester 2 (total of 60 credits)

Type	Code	Title	Level	-requisites		ECTS	Stream
				Pre-	Co-		
compulsory	ELEC6211	Project Preparation	7			7.5	-
optional	ELEC6233	Digital Systems Synthesis	7	ELEC6236		7.5	A
optional	ELEC6234	Embedded Processors	7	ELEC6236		7.5	A
optional	ELEC3202	Green Electronics	6	ELEC3207		7.5	B
optional	ELEC6208	MEMS Sensors and Actuators	7	ELEC6203		7.5	B
optional	ELEC6219	Wireless and Mobile Networks	7	ELEC3203		7.5	C
optional	ELEC6229	Advanced Systems and Signal Processing	7	ELEC6218		7.5	C
optional	OPTO6003	Photonic Materials	7			7.5	D
optional	OPTO6011	Optical Fibre Sensors	7	OPTO6008		7.5	D

The interim exit award after semester 2 can be a Postgraduate Certificate or a Postgraduate Diploma.

Summer (total of 60 credits)

Type	Code	Title	Level	-requisites		ECTS	Stream
				Pre-	Co-		
core	COMP6200	MSc Project	7			30	-

Additional costs

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. Costs that students registered for this programme typically also have to pay for are included in Appendix 2.

Progression requirements

The programme follows the University's regulations for [*Progression, Determination and Classification of Results : Standalone Masters Programmes*](#) as set out in the University Calendar.

Intermediate exit points

You will be eligible for an interim exit award if you complete part of the programme but not all of it, as follows:

Qualification	Minimum overall credit in ECTS	Minimum ECTS required at level of award
Postgraduate Diploma	at least 60	45
Postgraduate Certificate	at least 30	20

Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:

- Library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources
- High speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices – laptops, smartphones and tablet PCs – via the Eduroam wireless network; there is a wide range of application software available from the Student Public Workstations
- Computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources)
- Standard ICT tools such as Email, secure filestore and calendars
- Access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library
- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling
- Assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia)
- The Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards
- Career Destinations, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV
- Other support that includes health services (GPs), chaplaincy (for all faiths) and ‘out of hours’ support for students in Halls (18.00-08.00)
- A Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers

The Students’ Union provides:

- An academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students’ views to the University
- Opportunities for extracurricular activities and volunteering
- An Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- Support for student peer-to-peer groups, such as Nightline

Associated with your programme you will be able to access:

- The tutorial system – you will have a personal tutor whom you can meet on request for advice on your programme and choice of options, or for pastoral support
- The mentor system – you will have a personal mentor whom you can meet regularly for study advice, or for pastoral support
- The ECS Student Advisory Team provides additional pastoral support
- ECS computer workstations, with a range of manuals and books
- Specialist project laboratories
- Post-graduate demonstrators who provide additional support for your practical projects
- Personal email account and web access, including use of on-line collaboration tools
- Helpdesk in ECS (programming advisory)
- A web-site for each taught module, typically with teaching materials

Methods for evaluating the quality of teaching and learning

You will have the opportunity to have your say on the quality of the programme in the following ways:

- Completing student evaluation questionnaires for each module of the programme
- Acting as a student representative on various committees, e.g. Staff Student Liaison Committees, Faculty Programmes Committee OR providing comments to your student representative to feed back on your behalf
- Serving as a student representative on Faculty Scrutiny Groups for programme validation
- Taking part in programme validation meetings by joining a panel of students to meet with the Faculty Scrutiny Group

The ways in which the quality of your programme is checked, both inside and outside the University, are:

- Regular module and programme reports which are monitored by the Faculty
- Programme validation, normally every five years
- External examiners, who produce an annual report
- Professional body accreditation/inspection
- A national Research Excellence Framework (our research activity contributes directly to the quality of your learning experience)
- Higher Education Review by the Quality Assurance Agency for Higher Education

Criteria for admission

The University's Admissions Policy applies equally to all programmes of study. The following are the typical entry criteria to be used for selecting candidates for admission. The University's approved equivalencies for the requirements listed below will also be acceptable.

Undergraduate programmes

Qualification	Grades	Subjects required	Subjects not accepted	EPQ Alternative offer (if applicable)	Contextual Alternative offer (if applicable)
GCE A level	n/a	n/a	n/a	n/a	n/a
GCSE	n/a	n/a	n/a	n/a	n/a

Postgraduate programmes

Qualification	Grade/GPA	Subject requirements	Specific requirements
Bachelor's degree	2.1 Honours	a degree in electronic engineering or in a closely related discipline	<ul style="list-style-type: none"> - wide range of electronic engineering modules such as semiconductor devices, microprocessors, digital systems, electronic circuit design, control and communications, signal processing - physics and mathematics - MATLAB experience is recommended for the wireless communications and signal processing modules
Master's degree			

Mature applicants

Applications from mature students (over 21 years in the October of the year of entry) are welcome. Applications will be considered on an individual basis.

Recognition of Prior Learning (RPL)

The University has a [Recognition of Prior Learning Policy](#)

English Language Proficiency

If English is not your first language, you will be required to pass an approved English language test. We ask for the following minimal IELTS scores:

Overall	Reading	Writing	Speaking	Listening
6.5	6.0	6.0	6.0	6.0

Career Opportunities

This programme provides an excellent platform for a career in industry or in academia. Examples of industrial sectors are the electronics/semiconductor, telecommunications, photonics, materials and packaging, biotechnology, and car and aerospace industries. Graduates from our MSc programmes are employed worldwide in leading companies at the forefront of technology. As well as for larger multinationals, many students also go on to work for small to medium enterprises, including start-ups. ECS runs a dedicated careers hub which is affiliated with over 100 companies like IBM, ARM, Microsoft Research, Imagination Technologies, Nvidia, Samsung and Google to name a few. Visit our [careers hub](#) for more information.

External Examiner(s) for the Programme

Name **TBC**

Institution ----

Students must not contact External Examiner(s) directly, and external examiners have been advised to refer any such communications back to the University. Students should raise any general queries about the assessment and examination process for the programme with their Course Representative, for consideration through Staff: Student Liaison Committee in the first instance, and Student representatives on Staff Student Liaison Committees will have the opportunity to consider external examiners' reports as part of the University's quality assurance process.

External examiners do not have a direct role in determining results for individual students, and students wishing to discuss their own performance in assessment should contact their personal tutor in the first instance.

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found in the [FPSE Student Handbook](#).

Appendix 1:

Learning outcomes and Assessment Mapping document template

Learning Outcomes		Knowledge & Understanding					Intellectual & Research Skills					Transferable and Practical Skills					
Code	Module Title	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	D1
Compulsory modules																	
ELEC6211	Project Preparation	x				x			x	x	x	x	x			x	
Core modules																	
COMP6200	MSc Project	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x
Semester 1 optional modules																	
ELEC3203	Digital Coding and Transmission		x	x	x	x			x			x					
ELEC3207	Nanoelectronic Devices		x	x	x		x	x	x			x	x				x
ELEC3221	Digital IC and Systems Design		x	x	x	x	x	x	x			x	x	x			x
ELEC6201	Microfabrication		x	x	x		x	x	x	x		x	x	x			x
ELEC6203	Introduction to MEMS	x	x	x	x		x	x	x	x		x	x				x
ELEC6204	Microfluidics and Lab-on-a-Chip		x	x	x		x	x	x			x	x				x
ELEC6205	Bionanotechnology		x	x	x	x	x	x	x	x		x	x	x			x
ELEC6217	Radio Communications Engineering		x	x	x		x	x	x			x	x	x			x
ELEC6218	Signal Processing	x	x	x	x	x	x	x	x			x	x				x
ELEC6236	Digital System Design		x	x	x	x	x	x	x				x	x			x
ELEC6237	Secure Hardware Design		x	x	x	x	x	x	x			x	x	x			x
OPTO6007	An Introduction to Silicon Photonics	x	x	x	x		x	x	x	x			x				x
OPTO6008	Optical Fibre Technology I		x	x	x		x	x	x	x		x	x	x			x
Semester 2 optional modules																	
ELEC3202	Green Electronics		x	x	x		x	x	x			x	x	x			x
ELEC6208	MEMS Sensors and Actuators		x	x	x		x	x	x	x		x	x	x			x
ELEC6219	Wireless and Mobile Networks		x	x	x				x			x					
ELEC6229	Advanced Systems and Signal Processing	x	x	x	x	x	x	x	x			x	x				x
ELEC6233	Digital Systems Synthesis		x	x	x		x	x	x			x	x	x			x
ELEC6234	Embedded Processors		x	x	x		x	x	x			x	x	x			x
OPTO6003	Photonic Materials		x	x	x		x	x	x			x	x				x
OPTO6011	Optical Fibre Sensors		x	x	x	x	x	x	x			x	x	x			x

Code	Module Title	Assessment Methods	
		Coursework(s)	Exam
Semester 1 - compulsory modules			
n/a	n/a		
Semester 2 - compulsory modules			
ELEC6211	Project Preparation	Literature review - 40% Project plan - 30% Poster - 30%	-
Summer - core module			
COMP6200	MSc Project	Dissertation - 100%	-
Semester 1 - optional modules			
ELEC3203	Digital Coding and Transmission	-	2.5 hours - 100%
ELEC3207	Nanoelectronic Devices	Simulation report - 30%	2 hours - 70%
ELEC3221	Digital IC and Systems Design	Gate design assignment - 10%	2 hours - 90%
ELEC6201	Microfabrication	Lab report - 30%	2 hours - 70%
ELEC6203	Introduction to MEMS	Lab report - 30%	2 hours - 70%
ELEC6204	Microfluidics and Lab-on-a-Chip	Simulation report - 30%	2 hours - 70%
ELEC6205	Bionanotechnology	Lab report - 30%	2 hours - 70%
ELEC6217	Radio Communications Engineering	Radio exercise - 5% MATLAB simulation - 15% System design group exercise - 50%	1 hour - 30%
ELEC6218	Signal Processing	Design assignment - 10% Processing assignment - 10%	2 hours - 80%
ELEC6236	Digital System Design	Lab exercises - 10% Design exercise - 20%	2 hours - 70%
ELEC6237	Secure Hardware Design	IC design assignment - 65% Hardware assignment - 25% ; Lab - 10%	-
OPTO6007	An Introduction to Silicon Photonics	Work sheets x2 - 25%	2 hours - 75%
OPTO6008	Optical Fibre Technology I	Assignments and problem sheets (fortnightly) - 20%	2.5 hours - 80%
Semester 2 - optional modules			
ELEC3202	Green Electronics	Exercise (lab report) - 30%	2 hours - 70%
ELEC6208	MEMS Sensors and Actuators	Assignments x3 (25% each) - 75% Lab report - 25%	-
ELEC6219	Wireless and Mobile Networks	-	2 hours - 100%
ELEC6229	Advanced Systems and Signal Processing	Take home test - 10% Assignments x3 (20% each) - 60% Assignment (project) - 30%	-
ELEC6233	Digital Systems Synthesis	Low power lab - 10% System synthesis assignment - 40%	2 hours - 50%
ELEC6234	Embedded Processors	picoMIPS synthesis assignment - 50%	2 hours - 50%
OPTO6003	Photonic Materials	Assignment - 30%	2.5 hours - 70%
OPTO6011	Optical Fibre Sensors	Assignments and problem sheets (fortnightly) - 20%	2.5 hours - 80%

Appendix 2:

Additional Costs

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. In addition to this, students registered for this programme typically also have to pay for the items listed in the table below.

In some cases you'll be able to choose modules (which may have different costs associated with that module) which will change the overall cost of a programme to you. Details of such costs will be listed in the Module Profile. Please also ensure you read the section on additional costs in the University's Fees, Charges and Expenses Regulations in the University Calendar available at www.calendar.soton.ac.uk.

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
Approved Calculators		Candidates may use calculators in the examination room only as specified by the University and as permitted by the rubric of individual examination papers. The University approved models are Casio FX-570 and Casio FX-85GT Plus. These may be purchased from any source and no longer need to carry the University logo.
Stationery		You will be expected to provide your own day-to-day stationary items, e.g. pens, pencils, notebooks, etc). Any specialist stationery items will be specified under the Additional Costs tab of the relevant module profile.
Textbooks		Where a module specifies core texts these should generally be available on the reserve list in the library. However due to demand, students may prefer to buy their own copies. These can be purchased from any source. Some modules suggest reading texts as optional background reading. The library may hold copies of such texts, or alternatively you may wish to purchase your own copies. Although not essential reading, you may benefit from the additional reading materials for the module.
Equipment and Materials Equipment	Art Equipment and Materials: Drawing paper; painting materials; sketchbooks	
	Art Equipment and Materials: Fabric, Thread, Wool	
	Design equipment and materials:	
	Excavation equipment and materials:	
	Field Equipment and Materials:	
	Laboratory Equipment and Materials:	
	Medical Equipment and Materials: Fobwatch;	

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
	Music Equipment and Materials	
	Photography:	
	Recording Equipment:	
IT	Computer Discs	
	Software Licenses	
	Hardware	
Clothing	Lab Coats	
	Protective Clothing: Hard hat; safety boots; hi- viz vest/jackets;	
	Fieldcourse clothing:	
	Wet Suits?	
	Uniforms?	
Printing and Photocopying Costs		In the majority of cases, coursework such as essays; projects; dissertations is likely to be submitted on line. However, there are some items where it is not possible to submit on line and students will be asked to provide a printed copy.
Fieldwork: logistical costs	Accommodation:	
	Insurance	
	Travel costs	
	Immunisation/vaccination costs	
	Other:	
Placements (including Study Abroad Programmes)	Accommodation	
	Insurance	
	Medical Insurance	
	Travel costs	
	Immunisation/vaccination costs	
	Disclosure and Barring Certificates or Clearance	
	Translation of birth certificates	
	Other	
Conference expenses	Accommodation	
	Travel	
Optional Visits (e.g. museums, galleries)		
Professional Exams		
Parking Costs		
Anything else not covered elsewhere		

Revision History

1. **Optional Module Viability added – 06 December 2016**
2. **Information about previous experience with specialist tools added; ELEC6237 listed with new name; admission criteria updated; Assignment Methods Table updated – 2 February 2017**
3. **FPC approval for 17/18 – 03 March 2017**
4. **FPC approval of optional module size caveat – CQA team, 07 December 2017**