

Programme Specification

Electrical and Electronic Engineering 2015-16

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

Duration in Years

3 Years - BEng
4 Years MEng

Accreditation details Currently accredited by the The Institution of Engineering and

Technology (IET)

Final award Master of Engineering (MEng)
Name of award Electrical and Electronic Engineering
Interim Exit awards Bachelor of Engineering (BEng)

Bachelor of Engineering (BEng Ordinary)
Diploma of Higher Education (DipHE)
Certificate of Higher Education (CertHE)

FHEQ level of final award Level 7

UCAS code H602 MEng Electrical and Electronic Engineering

MEng Electrical and Electronic Engineering with Industrial Studies

H600 BEng Electrical and Electronic Engineering

QAA Subject Benchmark or other

external reference

Quality Assurance Agency (QAA) Engineering Benchmark QAA Framework for Higher Education Qualifications (FHEQ)

Engineering Council (UK-SPEC)

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Programme Overview

Brief outline of the programme

Electrical and Electronic engineering drives the fundamental technologies of today's connected world. Every area of our lives, from energy supply and transmission, medicine and healthcare to industrial applications, global trade, transport, communications, entertainment and security, is dependent on electrical and electronic technology. As a result, electrical and electronic engineering is now one of the fastest growing job fields in the world and skilled electrical and electronic engineers are very much in demand.

At Southampton, we will ensure that you have a thorough grounding in a wide range of technologies. Our project work will enable you to acquire valuable skills in teamwork, project planning, time-management and presentation, applying your learning to design and build problems, and working to a brief. All of these will stand you in good stead as you move into your career. We offer outstanding facilities in our labs and teaching is based on the latest research, ensuring that, at the end of your programme, your skills will be highly regarded by leading employers. All of our programmes have a wide range of courses and modules to choose from, enabling you to specialise in what really interests you and also to work in depth. Our "MEng Electrical and Electronic Engineering with Industrial Studies" variant includes a year in industry, giving you additional experience and the opportunity to relate your academic skills and knowledge to contemporary industrial practice.

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 <u>Disclaimer</u> 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.

Learning and teaching

A range of learning and teaching methods are used on this programme, including:

- Staff-led lectures, demonstrations, laboratories and seminars
- Directed reading
- Student-led seminars and presentations
- Specification, design, analysis, implementation and verification exercises
- Revision for written examinations
- Staff and post-graduate supervision of your research dissertation
- Industrial placements

Assessment

A range of assessment methods are used on this programme to enable students to demonstrate their achievement of the intended learning outcomes, including:

- · Written examinations
- In-class tests
- Design exercises
- Programming exercises
- Oral presentations
- · Written assessments, including technical reports, literature searches and surveys
- Assessed laboratories and logbook checks
- Group work exercises, presentations and reports

Feedback

A range of feedback methods are used on this programme to enable students to gauge their progress in meeting the intended learning outcomes, including:

- Feedback from personal tutor
- Written feedback for large courseworks
- · Instant oral feedback on presentations, tutorials and practical laboratories
- · Feedback on the overall class performance in particular modules
- Marked courseworks

Educational Aims of the Programme

The aims of the programme are to:

- Provide you with a sound foundation and to develop the skills, knowledge, and application required for a
 wide range of professional engineering careers as a high quality practitioner and leader in business,
 engineering, research and development, and industry,
- Provide coherent and well balanced coverage of theory, design and practical subjects based on mathematics, science and engineering, integrated with business and management,
- Have a flexible academic structure, which is relevant and attractive not only to you, but also to staff and industry and which is responsive to progress and development in technology and the needs of the industrial and academic communities,
- Be at the leading edge of scholarship in electrical and electronic engineering,
- Maximise the benefit of an environment in which staff are carrying out internationally competitive and leading research across all aspects of electronics and computer science,
- Provide an environment which contributes towards your personal and professional development and provides a foundation for a wide range of subsequent study and lifelong learning,

- Provide a well-found learning environment with sufficient laboratories containing appropriate equipment and facilities, up-to date CAD tools, and a first class web-site, motivating you towards the practice of engineering.
- Provide a supportive pastoral environment with opportunities for you to participate in social and recreational activities, and
- (For the "MEng Electrical and Electronic Engineering with Industrial Studies" variant) Provide you with industrial experience, to enable you to relate your academic skills and knowledge to contemporary industrial practice.

Programme Learning Outcomes

Knowledge and Understanding

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

- A1. Underpinning key mathematics and science skills appropriate to electrical and electronic engineering, both as a method for communicating results, concepts and ideas and as a tool for solving complex problems,
- A2. Underpinning principles, methodologies and concepts applicable to electrical and electronic engineering, as well as their role in historical, current, and future developments and technologies,
- A3. Practical, computational and programming skills relating to electrical and electronic engineering, and compatible with current industrial practice,
- A4. Demonstrate specialised technical knowledge in chosen areas of engineering; if you are an MEng student you will exhibit an increased depth and range of specialist knowledge,
- A5. Apply the knowledge and understanding outlined above to the development and evaluation of possible solutions to electrical and electronic engineering problems,
- A6. Demonstrate awareness of major issues at the frontiers of engineering research and development, and their possible exploitation to enhance current practices,
- A7. Demonstrate awareness of financial, economic, and social factors of significance to electrical and electronic engineering including the broader obligations of engineers to society.

If you are an MEng student, you will also have:

- A8. A comprehensive understanding of techniques applicable to their own research or advanced scholarship,
- A9. Conceptual understanding that enables you to make critical evaluations of current research and advanced scholarship in electrical and electronic engineering, to evaluate methodologies and to develop critiques of them, coupled with practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in electrical and electronic engineering.
- A10. (For the "with Industrial Studies" variant) How to apply your academic skills and knowledge to solving problems in industry.
- A11. (For the "with Industrial Studies" variant) The relevance of the learning outcomes listed above to a successful career in industry.

Teaching and Learning Methods

Programmes are taught mainly through Lectures and Directed Reading. Learning is reinforced through tutorials (in the first two parts), design exercises (in the first two parts), coursework assignments, and project work (both individual and in groups). Outcome A1 is largely taught by self-paced methods (worksheets and in-class tests) in parts 1 and 2, and a satisfactory knowledge and understanding is implicit in your ability to complete the second and third part modules. Outcomes A2, A6-A9 are largely taught through lectured modules with understanding developed through coursework and Laboratories. A substantial body of coursework in part 2 develops outcome

A3, and outcome A5 is developed through project supervisions in parts 3 and 4. Outcomes A10 and A11 are reached during the year in industry of the "with Industrial Studies" variant.

Assessment methods

Knowledge and understanding of each subject (outcomes A1-A3) are assessed mainly through written examinations. Additional forms of assessment include technical reports (outcomes A5-A7), seminar presentations (A8-A9), and project reports (A5-A9). Outcomes A10 and A11 are assessed by a report, which is written during the year in industry of the "with Industrial Studies" variant.

Subject Specific Intellectual and Research Skills

Having successfully completed this programme you will be able to:

- B1. Integrate knowledge of mathematics, science, information technology, businesses context and electrical and electronic engineering practice, to develop analytical and innovative solutions to engineering problems,
- B2. Critically analyse and evaluate the extent to which designs and products meet the criteria defined for their current use and future developments, taking account of the impact of new and advancing technology to enhance current practice,
- B3. Apply in an appropriate manner computer-aided tools in the design process so as to aid understanding of design trade-offs, and recognise capabilities and limitations of computer-based methods for engineering problem solving,
- B4. Recognise the professional, moral and ethical issues involved in the exploitation of technology and science and be guided by the adoption of appropriate professional, ethical and legal practices,
- B5. Assess technical and commercial risks, and take appropriate steps to manage those risks in the context of engineering design and solutions,
- B6. Solve problems through systematic analysis and design methods and to tackle non-routine problems in creative and innovative ways,
- B7. Exercise awareness of quality systems and management in engineering; (MEng only) requirements and responsibilities of leadership; business and management practices relevant to electronic engineering enterprises.

Teaching and Learning Methods

These intellectual skills are taught mainly through Course- and Project-work, and design exercises. Relevant material is also covered in Lectures, Guest Lectures and (for part four MEng students) Seminars. Skill B1 is developed through Group Project Work in parts 2 and 4. Skill B2 is a consistent theme in the taught technical modules in part 3. Advanced CAD tools (skill B3) are used in laboratory and project work in every part of the degree. Skills B4, B5 and B7 are covered through Professional Issues within the laboratory programme in part 1 and developed further in parts 3 and 4. Skill B6 is developed through the Individual and Group Project work in parts 2-4.

Assessment methods

In-class tests and Written Examinations (skill B1), Technical Reports (skills B2, B4 and B7), Design Exercises (skill B3), Logbook Checks (skill B4), Design Project Reports and Presentations (skills B4-B7).

Transferable and Generic Skills

Having successfully completed this programme you will be able to:

C1. Use IT facilities including word processing, spreadsheets, browsers and search engines to find technical information,

- C2. Effectively present to audiences (orally, electronically or in writing) rational and reasoned arguments that address a given engineering problem or opportunity, including assessment of the impact of new technologies,
- C3. Work on a significant technical project both independently and as a member of a design team, managing both the overall task and your contribution to that task, particularly in the MEng programmes,
- C4. Understand the need for continuing professional development in recognition of lifelong learning,
- C5. Competently manage projects, people, resources and time.
- C6. (For the "with Industrial Studies" variant.) Apply the key skills listed above to industrial projects.

Teaching and Learning Methods

General proficiency with IT (skill C1) pervades the degree, and is not specifically taught. Presentations and report-writing (skill C2) are covered in part 1 lectures and practiced throughout the programme. Independent, and group working, and organisational skills (skills C3 and C5) are taught for, and developed by, the Individual and Group Projects. Professional development (skill C4) is covered in lectures.

Assessment methods

Design Exercises and Projects (both Individual and Group), Technical Reports, Project and Seminar Presentations.

Subject Specific Practical Skills

Having successfully completed this programme you will be able to:

- D1. Specify, design, and construct electronic circuits, systems and computer software, taking account of commercial and industrial constraints,
- D2. Use CAD, simulation, design, and verification tools to aid in the design of systems, and to report and comment on results.
- D3. Use test and measurement instrumentation appropriate to the discipline including awareness of measurements accuracy and coverage,
- D4. Recognise any risks or safety aspects that may be involved in the operation of systems within a given context,
- D5. Search for information related to a design solution and present it for discussion.

Teaching and Learning Methods

Skill D1 is taught and developed through Design Modules and Projects in parts 2-4. Advanced CAD tools (skill D2) are used in laboratory and project work in every part of the degree. Skills D3-D4 are covered in Lectures and Laboratory Sessions in parts 1 and 2. Skill D5 is taught through Lectures and Project Supervisions.

Assessment methods

Design Exercises (skills D1,D2 and D5), Supervised Laboratories (skills D3-D4), Design Projects (skills D4-D5), Technical Reports and Seminar Presentations (skill D5).

Graduate Attributes

Graduate Attributes are the personal qualities, skills and understanding you can develop during your studies. They include but extend beyond your knowledge of an academic discipline and its technical proficiencies. Graduate Attributes are important because they equip you for the challenge of contributing to your chosen profession and may enable you to take a leading role in shaping the society in which you live.

We offer you the opportunity to develop these attributes through your successful engagement with the learning and teaching of your programme and your active participation in University life. The skills, knowledge and personal qualities that underpin the Graduate Attributes are supported by your discipline. As such, each attribute is enriched, made distinct and expressed through the variety of learning experiences you will experience. Your development of Graduate Attributes presumes basic competencies on entry to the University.

There are six Graduate Attributes:

Global Citizenship

Global Citizens recognise the value of meaningful contribution to an interconnected global society and aspire to realise an individual's human rights with tolerance and respect.

Ethical Leadership

Ethical Leaders understand the value of leading and contributing responsibly to the benefit of their chosen professions, as well as local, national and international communities.

Research and Inquiry

Research and Inquiry underpin the formulation of well-informed new ideas and a creative approach to problem resolution and entrepreneurial behaviours

Academic

Academic attributes are the tools that sustain an independent capacity to critically understand a discipline and apply knowledge

Communication Skills

Communication Skills encompass an individual's ability to demonstrate knowledge, and to express ideas with confidence and clarity to a variety of audiences

Reflective Learner

The Reflective Learner is capable of the independent reflection necessary to develop their learning and continuously meet the challenge of pursuing excellence

The following table shows the mapping between the University's Graduate Attributes, and a key subset of the core and compulsory modules that form the degree programme.

Code	Module Title	Global Citizenship	Ethical Leadership	Research and Inquiry	Academic	Communication Skills	Reflective Learner
	Part 1 labs	•	•			•	
COMP3200	Individual Project			•	•	•	•
MANG3067	Engineering Management and Law	•	•				
ELEC3200	Industrial Studies		•		•	•	•
COMP6200	Group Design Project			•	•	•	•

Programme Structure

Typical course content

You will study 60 ECTS credits, in parts 1, 2 and 3, and, if an MEng student, 60 ECTS credits in part 4. These credits are at level 4 in the Framework for Higher Education Qualifications in part 1, mainly at level 5 in part 2, then at level 6 in part 3, and level 7 in part 4. If you complete a year in industry, as part of the "with Industrial"

Studies" variant, you will complete a study worth 30 ECTS credits at level 6. This will qualify you for the award of the enhanced degree. Students intending to graduate with MEng degrees are encouraged to spend 20 weeks in industry, usually as two 10-week summer placements. For students studying at USMC, the normal expectation is that you will complete your first two years of study in Malaysia prior to direct entry into year 3 of the MEng course.

The main areas addressed in the first two parts are mathematics, mechanics, electrical materials and fields, electronic circuits and systems, microprocessors, programming, software design, development and verification, control and systems engineering, power circuits and power electronics, CAD tools and practical laboratory work. Core material covers professional practice, with major individual and group projects, and taught components covering industrial practice and engineering management. You will also choose from a range of technical options. Many of these are in the specialist areas of Electrical Power Engineering, High Voltage Engineering, Computational Intelligence, Mobile & Secure Systems, Computer Systems, Nanotechnology, Optical Electronics, and Wireless Communications.

Programme details

The programme comprises four parts.

Part I: 60 ECTS credits at FHEQ level 4

All modules are core and so are not eligible for compensation. Seven compulsory modules (C) plus one option (O).

Module Code	Title	Semester	ECTS	
ELEC1206	Electrical Materials and Fields	1+2	7.5	С
MATH1055	Mathematics for Electronic and Electrical Engineering I	1+2	7.5	С
ELEC1200	Electronic Circuits	1	7.5	С
ELEC1201	Programming	1	7.5	С
ELEC1202	Digital Systems & Microprocessors	1	7.5	С
ELEC1207	Electronic Systems	2	7.5	С
ELEC1205	Solid State Electronics	2	7.5	С
ELEC1203	Mechanics	2	7.5	0
ELEC1204	Advanced Programming	2	7.5	0

University of Southampton Malaysia Campus (USMC): initially it is anticipated that only one of ELEC1203, ELEC1204 will be offered.

Part II: 60 ECTS credits at FHEQ level 5 except as noted

Seven compulsory modules (C) plus one option (O).

	L.,				
Module Code	Title	Semester	ECTS	UK	USMC
ELEC2221	Digital Systems and Signal Processing	1	7.5	С	С
ELEC2220	Control and Communications	1	7.5	С	С
ELEC2219	Electromagnetism for EEE	1	7.5	С	С
MATH2047	Mathematics for Electrical & Electronic Engineering II	1	7.5	С	С
ELEC2217	EEE Design	2	7.5	С	С
ELEC2222	Circuits and Transmission	2	7.5	С	С
ELEC2208	Power Electronics and Drives	2	7.5	С	С
ELEC2201	Devices	2	7.5	0	С
ELEC1204	Advanced Programming	2	7.5	0	
ELEC2213	Electrical Machines	2	7.5	0	
ELEC2204	Computer Engineering	2	7.5	0	
ELEC2216	Advanced Electronic Systems	2	7.5	0	
ELEC2206	Materials	2	7.5	0	

University of Southampton Malaysia Campus (USMC): initially no options in part II will be offered. Initially, part I ELEC1204 + part II ELEC2201 only will be available.

Year in Industry: 30 ECTS credits at FHEQ level 6

Students on the "with Industrial Studies" variant will complete a year at a recognised partner company. This year may be taken between years 2 and 3, or between years 3 and 4 (MEng only). During this year, students must complete one or more projects, as agreed between the partner company and the School. The placement will be assessed by a report and other activities, as described in the module specification (ELEC3200). This module is core, and must be passed for the award of the "with Industrial Studies" degree title, but marks for this module will not contribute to the final degree classification.

Part III: 60 ECTS credits at FHEQ level 6 except as noted

All students must take the COMP3200 Individual Project (22.5 ECTS), which is core and is weighted 7.5 ECTS in Semester I and 15 ECTS in semester II. In addition, students must take certain specified modules, as given in the tables below.

Students should note that there are a number of prerequisites for the optional modules that are listed in the module specifications; decisions they made for Pt II may affect their choice. It should also be noted that it may not be possible to run some modules if the number of students registered is very small.

Finally, students should select optional modules to make up the total to 60 ECTS. Besides COMP3200, MANG3067 and specialised modules, a maximum of 2 other "externally taught" modules (COMPxxxx, OPTOxxxx, ENTRxxxx, FRENxxxx, GERMxxxx, LANGxxxx, LAWSxxxx MANGxxxx, UOSMxxxx and MATHxxxx) may be chosen. Students must select a 60:60 credit balance between semesters. 15 ECTS can be backtracked from part II optional modules.

Students should note that there are a number of prerequisites for the optional modules which are listed in the module specifications; decisions they made for Pt III may affect their choice.

The BEng and MEng programmes have core (CO), compulsory (C) and optional (O) modules as follows:

	Part III modules				
Module Code	Title	Semester	ECTS	BEng	MEng
COMP3200	Individual Project	both	22.5	CO	CO
MANG3067	Engineering Management and Law	1	7.5	0	С
COMP3201	Cyber Security	1	7.5	0	0
COMP3206	Machine Learning	1	7.5	0	0
	Real-time Computing and Embedded		7.5		
COMP3215	Systems	1		0	0
ELEC3201	Robotic Systems	1	7.5	0	0
ELEC3203	Digital Coding and Transmission	1	7.5	0	0
ELEC3205	Control System Design	1	7.5	0	0
ELEC3207	Nanoelectronic Devices	1	7.5	0	0
ELEC3210	Design Studies	1	7.5	0	0
ELEC3218	Signal and Image Processing	1	7.5	0	0
ELEC3221	Digital IC and Systems Design	1	7.5	0	0
ELEC3222	Computer Networks	1	7.5	0	0
MATH3083	Advanced Partial Differential Equations	1	7.5	0	0
MATH3081	Operational Research	1	7.5	0	0
ELEC3214	Power Systems Technology	1	7.5	0	0
COMP3212	Computational Biology	2	7.5	0	0
	Principles and Practice of Computer		7.5		
COMP3214	Graphics	2		0	0
COMP3216	Safety-Critical Systems	2	7.5	0	0
COMP3217	Secure Systems	2	7.5	0	0
ELEC3202	Green Electronics	2	7.5	0	0
ELEC3204	Wireless and Optical Communications	2	7.5	0	0
ELEC3206	Digital Control System Design	2	7.5	0	0
ELEC3208	Analogue and Mixed Signal Electronics	2	7.5	0	0
ELEC3217	Photonics	2	7.5	0	0
ELEC3219	Advanced Computer Architecture	2	7.5	0	0
ELEC3213	Power Systems Engineering	2	7.5	0	0
ELEC3212	Application of Electrical Materials	2	7.5	0	0
ELEC3211	High Voltage Engineering	2	7.5	0	0
ELEC2201	Devices	2	7.5	0	0
ELEC2213	Electrical Machines	2	7.5	0	0
ELEC2204	Computer Engineering	2	7.5	0	0
ELEC2216	Advanced Electronic Systems	2	7.5	0	0
ELEC2206	Materials	2	7.5	0	0
LANGxxxx	A language module scheduled in the	2	7.5	0	0

	Broadening Horizons slot. The appropriate stage will be selected after assessment by the language school				
MATH3084	Integral Transform Methods	2	7.5	0	0
MATH3082	Optimisation	2	7.5	0	0
	Any other module from the University's		7.5		
UOSMxxxx	Broadening Horizons programme	2		0	0

Part IV: 60 ECTS credits at FHEQ level 7

All students must take the ELEC6200 Group Design Project (22.5 credits), which is core and is weighted 15 ECTS in Semester I and 7.5 ECTS in semester II. In addition, students must take certain specified modules, as given in the tables below.

Students should note that there are a number of prerequisites for the optional modules which are listed in the module specifications; decisions they made for Pt III may affect their choice. It should also be noted that it may not be possible to run some modules if the number of students registered is very small.

Finally, students should select optional modules to make up the total to 60 ECTS. Besides COMP6228 and specialised modules, a maximum of 2 other "externally taught" modules (COMPxxxx, OPTOxxxx, ENTRxxxx, FRENxxxx, GERMxxxx, LANGxxxx, LAWSxxxx MANGxxxx and MATHxxxx) may be chosen. Students must select a 30:30 ECTS balance between semesters.

The MEng programme has core (CO), compulsory (C) and optional (O) modules as follows:

	Part IV modules			
Module Code	Title	Semester	ECTS	
ELEC6200	Group Design Project	both	22.5	СО
COMP6202	Evolution of Complexity	1	7.5	0
COMP6204	Software Project Management and Development	1	7.5	0
ELEC6201	Microfabrication	1	7.5	0
ELEC6202	Advanced Memory and Storage	1	7.5	0
ELEC6203	Introduction to MEMS	1	7.5	0
ELEC6204	Microfluidics and Lab-on-a-Chip	1	7.5	0
ELEC6205	Bionanotechnology	1	7.5	0
ELEC6217	Radio Communications Engineering	1	7.5	0
ELEC6230	VLSI Systems Design	1	7.5	0
ELEC6237	System on Chip Electronic Design Automation	1	7.5	0
ELEC6241	System on Chip Design Techniques	1	7.5	0
ELEC6245	Wireless Networks	1	7.5	0
MATH6141	Numerical Methods	1	7.5	0
MATH6148	Statistical Engineering	1	7.5	0
OPTO6007	An Introduction to Silicon Photonics	1	7.5	0
OPTO6008	Optical Fibre Technology I	1	7.5	0
OPTO6009	Optical Fibre Technology I I	1	7.5	0
ELEC6220	Power Systems Analysis	1	7.5	0
ELEC6221	Power Generation: Technology and Impact on	1	7.5	0
	Society			
ELEC6222	Transmission and Distribution	1	7.5	0
ELEC6203	Introduction to MEMs	1	7.5	0
COMP6206	Advanced Computer Vision	2	7.5	0
COMP6208	Advanced Machine Learning	2	7.5	0
COMP6210	Automated Software Verification	2	7.5	0
COMP6212	Computational Finance	2	7.5	0
COMP6228	Individual Research Project	2	7.5	0
ELEC6206	Nanofabrication and Microscopy	2	7.5	0
ELEC6207	Quantum Devices and Technology	2	7.5	0
ELEC6208	MEMS Sensors and Actuators	2	7.5	0
ELEC6209	Practical Applications of MEMS	2	7.5	0
ELEC6210	Biosensors	2	7.5	0
ELEC6212	Biologically-Inspired Robotics	2	7.5	0
ELEC6213	Image Processing	2	7.5	0
	Advanced Wireless Communication Networks and		7.5	
ELEC6214	Systems	2		0
ELEC6215	Integrated RF Transceiver Design	2	7.5	0
ELEC6216	Personal Multimedia Communications	2	7.5	0
ELEC6227	Medical Electrical and Electronic Technologies	2	7.5	0
ELEC6228	Applied Control Systems	2	7.5	0
ELEC6231	VLSI Design Project	2	7.5	0

ELEC6232	Analogue and Mixed Signal CMOS design	2	7.5	0
ELEC6233	Digital System Synthesis	2	7.5	0
ELEC6234	Embedded Processors	2	7.5	0
ELEC6235	System on Chip Design Project	2	7.5	0
ELEC6242	Cryptography	2	7.5	0
MATH6149	Modelling with Differential Equations	2	7.5	0
OPTO6003	Photonic Materials	2	7.5	0
OPTO6004	Metamaterials, Nanophonics and Plasmonics	2	7.5	0
ELEC6224	Advanced Electrical Materials	2	7.5	0
ELEC6225	High Voltage Insulation Systems	2	7.5	0
ELEC6226	Power Electronics for DC Transmission	2	7.5	0

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 <u>Progression</u>, <u>Determination and Classification of Results</u>: <u>Undergraduate and Integrated Masters Programmes</u> and <u>Academic Regulations - Faculty of Physical Sciences and Engineering</u> 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 ECTS Credits required at level of award
Honours degree - BEng (hons)	at least 180	45
Ordinary degree - BEng	at least 150	30
Diploma of Higher Education - DipHE	at least 120	45
Certificate of HE - CertHE	at least 60	45

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 upto-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 Student Services Centre
- Enabling Services offering assessment and support (including specialist IT support) facilities if you have a disability, dyslexia, mental health issue or specific learning difficulties
- 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
- a range of personal support services: mentoring, counselling, residence support service, chaplaincy, health service
- 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:

- Induction You will have an induction programme at the start of your programme. Besides covering the usual routine matters, it is especially important for you to be properly registered and to have your computer account set up, since the modules you study are supported by on-line systems. Assessment is also managed on-line, so any delay in registration could be detrimental to your studies. In addition, a diagnostic exercise helps us to assess your strengths and offer advice on how best to focus your efforts in the early stages of your studies.
- Personal tutoring At the start of your studies, you are allocated a Personal Tutor who you will see regularly. Also there is Senior Tutoring team if your personal tutor is not available.
- Computer workstations, with a range of software, manuals and books, with early to late access through a card-lock mechanism.
- Traditional and wireless local area networks.
- Helpdesk for computer support and programming advice.
- Postgraduate demonstrators, who support programming intensive modules.
- A website with notes for every module https://secure.ecs.soton.ac.uk/student/.
- The <u>FPSE Student Handbook</u>.
- Vending machines.

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
- Accreditation/inspection by the Institution of Engineering and Technology
- 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

Your views matter to us. We have a high reputation for quality of delivery, and we aim to keep it that way. The most important form of feedback comes through direct, personal contact, and we encourage you to talk to us if anything becomes a concern at any stage. If you find it difficult to talk directly to the member of staff with whom you have immediate contact, you are encouraged to talk to someone else in the teaching team, the Senior Tutor, or the School's Student Services Office, but we do encourage you to talk about it immediately. In addition, there is always a formal evaluation of each module by questionnaire at the end of the semester. These questionnaires are analysed and peer reviewed, and must be responded to formally, both to you and to the University. We also hold Student-Staff Liaison Committee meetings at least twice a year. Anyone is welcome to these meetings, but depending on the circumstances, it may be more effective to elect programme representatives who will make your views known. This then enables you to have an element of anonymity should you be embarrassed in any way about the idea of speaking up.

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	BEng: AAA MEng: A*AA	Maths and Physics. In some cases, Physics may be substituted by Further Maths of Electronics.	General Studies and Critical Thinking.	n/a	Considered on a case-by-case basis.
GCSE					
ВТЕС	Considered on a case-by- case basis				
International Baccalaureate	BEng: 36 points overall with 18 at Higher Level including 6 in Maths, 6 in Physics at HL MEng: 38 points overall with 18 at Higher Level including 6 in Maths, 6 in Physics at HL	Maths, Physics			
European Baccalaureate	85% overall with 85% in both Maths and Physics				

Postgraduate programmes

Qualification	Grade/GPA	Subjects requirements	Specific requirements
Bachelor's degree			
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.

English Language Proficiency

Overall	Reading	Writing	Speaking	Listening
6.5	5.5	5.5	5.5	5.5

Transfer policy

Electronic Engineering (EL) and Electrical & Electronic Engineering (EEE) have higher entry requirements than Electrical Engineering (EE) and Electromechanical Engineering (EM). Likewise, MEng programmes have higher entry requirements than BEng programmes. Part 1 of the above-listed programmes are identical, with the exception that EL students take ELEC1204 Advanced Programming, while EE and EM students take ELEC1203 Mechanics and while EEE students have the choice of either ELEC1203 or ELEC1204. Parts 1 and 2 of BEng programmes are identical to those of the corresponding MEng programmes, but they diverge in part 3. These issues impose complications upon transfers between these programmes, which are resolved as follows.

Students who are thinking about transferring between EL, EEE, EE and EM are encouraged to discuss this with their academic tutors at the earliest possible opportunity. Transfers between these programmes can be arranged at any time, at the discretion of the programme leader of the destination programme. Additionally, the programme leaders will guarantee transfers between BEng EL, EEE, EE and EM at the end of part 1, for students that have passed that part with an overall average (before referral marks are capped) of at least 58% (without rounding up). Likewise, the programme leaders will guarantee transfers between MEng EL, EEE, EE and EM at the end of part 1, for students that have met the same criterion. However, students seeking transfer to EM will also need to have taken ELEC1203, in order to meet this criterion. Students seeking transfer to EE will not need to have taken ELEC1203, in order to meet this criterion, although in this case they are advised to study the topics of ELEC1203 during the summer before beginning part 2. Likewise, students seeking transfer to EL will not need to have taken ELEC1204, in order to meet this criterion, although in this case they are advised to study the topics of ELEC1204 during the summer before beginning part 2.

Similarly, students who are thinking about transferring between BEng and MEng programmes are encouraged to discuss this with their academic tutors at the earliest possible opportunity. Transfers between BEng and MEng programmes can be arranged at any time, at the discretion of the programme leader of the destination programme. Additionally, the programme leaders will guarantee transfers between BEng and MEng programmes at the end of part 2, for students that have passed that part with an overall average (before referral marks are capped) of at least 58% (without rounding up).

Career Opportunities

Major employers worldwide are keen to employ our graduates – in system development, information technology and communications in the IT sector, and in the finance, service, communications and entertainment industries.

We have strong relationships with employers and hold our own annual careers fair.	, run our own Careers	Hub website (www.ecs.	soton.ac.uk/careers)

External Examiners(s) for the programme

Name: Jan Maciejowski

Institution: University of Cambridge

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 programme handbook (or other appropriate guide) or online at https://secure.ecs.soton.ac.uk/student/, see also https://www.fpse.soton.ac.uk/student/ handbook for related information.

The information in this programme specification is accurate at the time of writing, but may change in minor ways from year to year due to staff availability or other factors. Some of these modules are subject to prerequisites and exclusions that, for brevity, are not given here; this information is available in the module specifications available at https://secure.ecs.soton.ac.uk/student/

Appendix 1: Learning outcomes

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Module Code		Д1	Δ2	A3				Inder A7			A10	A11	B1	R2	ВЗ	B4	B5	B6	B7	C1	C2	C3	САТ	C5	CF	D1	D2	D3	D4 T	D5
	Part I	1 1	1 72	1 73	\\^-	1	1~	17	100	1	AIO	711	DI	D2	55	54	05	БО	Β,	-	CZ	CJ	-		-	D1	02		54	
ELEC1206	Electrical Materials and Fields	0			0															0								0	0	_
MATH1055 ELEC1200	Mathematics for Electrical & Electronic Engineering I Electronic Circuits	0	0		0	0			\vdash	\vdash				0	0		0	0		0		0	\vdash	0	Н	0	0	0	0	—
ELEC1201	Programming		۲	0	0	0								Ť	Ť		0	0		0		0		0		0		0	0	_
ELEC1202	Digital Systems & Microprocessors		0		0	0								0	0		0	0		0		0		0		0	0	0	0	
ELEC1204 ELEC1205	Advanced Programming Solid State Electronics	0	-	0	0	-														0			\vdash		Ш		Н	0	0	_
ELEC1207	Electronic Systems	۲	0		6	+			\vdash	<u> </u>				0						0			\vdash		H		H	0	0	_
ELEC1203	Mechanics	0			0								0							0		0						0	0	_
	Part II																													
ELEC2219	Electromagnetism for EEE	0	<u> </u>		0	╄			-	-				_	L_					0			\vdash		ш				_	_
ELEC2220 ELEC2221	Control and Communications Digital Systems and Signal Processing		0		0	+								0	0					0			\vdash		Н	H	0	0	0	—
MATH2047	Mathematics for Electrical & Electronic Engineering II	0	Ť		0	T								Ť						0			П		П	П	П	Ħ	Ť	_
ELEC2201	Devices	0			0															0								0	0	
ELEC2204	Computer Engineering		0	<u> </u>	0	 		0	_					0	0			0		0	_	_	\square	0	Ш	0	0	0	0	0
ELEC2217 ELEC2216	EEE Design Advanced Electronic Systems		0	0	0	0		10	\vdash	-			0	0	0	0	0	U		0	0	0	\vdash	U	H		0	0	0	_
ELEC2222	Circuits and Transmission	0	0		0		0						0							0	0	0			П		0	0	0	_
ELEC2208	Power Electronics and Drives				0															0								\Box		_
ELEC2213 ELEC2206	Electrical Machines Materials	0	0		0	₩								0						0		0	\vdash		Ш	Ш	Ш	\vdash	0	0
ELECZZUB	Part III		۲		۲	+			\vdash	-										-			\vdash		H		\vdash	\vdash	\dashv	_
ELEC3200	Year in Industry		T		0	1					0	0								0					0	П	П	П	\neg	_
COMP3200	Individual Project				0	0	0		0	0			0			0	0	0		0	0	0		0		0				0
COMP3201	Cyber Security	_	⊢		0	╀			-	_										0			\vdash		ш	\vdash	\sqcup	\vdash	\dashv	_
COMP3206 COMP3215	Machine Learning Real-time Computing and Embedded Systems		\vdash	\vdash	0	+	\vdash		\vdash	\vdash			\vdash	0	0				H	0			\vdash		Н	Н	0	0	+	—
ELEC3201	Robotic Systems				0									0	0					0					H	H	0	Ħ		_
ELEC3203	Digital Coding and Transmission		Г		0	\Box								0					П	0			口		┙	\Box	\Box	П		_
ELEC3205 ELEC3207	Control System Design Nanoelectronic Devices		\vdash	-	0	+	1	\vdash	\vdash	\vdash			\vdash	0	0	_			Н	0			\vdash		Н	\vdash	0	Н	+	—
ELEC3218	Signal and Image Processing		\vdash		0	T	T	T	\vdash	\vdash				0	Ť				H	0			\sqcap		H	H	H	\sqcap	\dashv	_
ELEC3221	Digital IC and Systems Design				0									0	0					0							0	口		_
MANG3067	Engineering Management and Law	_	H		0	_	<u> </u>	0	1	1			\vdash	L		0			0	0	_		0		\vdash	\vdash	\vdash	$\vdash \vdash$		_
MATH3024 MATH3027	Advanced PDEs Operational Research	0	\vdash	+	0	+	+	1	1	\vdash	<u> </u>		\vdash				\vdash		Н	0	\dashv		\vdash		Н	\vdash	\vdash	\vdash	+	—
COMP3212	Computational Biology	Ľ			0	İ	Ħ	Ħ											Ħ	0					H	H		口	一	_
COMP3214	Principles and Practice of Computer Graphics		Г	0	0															0			П					口	T	
COMP3216 COMP3217	Safety-Critical Systems	_	\vdash	-	0	-	-	-	-	-	<u> </u>		\vdash	_	-	_	\vdash		Н	0			$\vdash\vdash$		\vdash	\vdash	\vdash	\vdash	\dashv	_
ELEC3202	Secure Systems Green Electronics		\vdash	+	0	+	\vdash		1					0					H	0			\vdash		Н	H	\vdash	Н	+	—
ELEC3204	Wireless and Optical Communications				0	T								ō	0					0					П		0	П	\neg	_
ELEC3206	Digital Control System Design				0									0						0										
ELEC3208 ELEC3217	Analogue and Mixed Signal Electronics		-		0	\vdash								0	0					0			\vdash		ш		0	\vdash	_	—
ELEC3217	Photonics Advanced Computer Architecture		-		6	+								0	0					0			\vdash		H	H	0	H	-	_
MATH3025	Transform Methods	0			0									Ť	Ť					0							Ť			_
MATH3082	Optimisation	0			0									0	0					0							0			
ELEC3214 ELEC3210	Power Systems Technology Design Studies	0	0		0	0		0						0	0			0		0			\vdash	0	Ш		0	\vdash	_	0
ELEC3210	Power Systems Engineering	0	0	0	6	6		10	\vdash	\vdash				۲	0			-		0	0		\vdash		0	H	Н	\vdash	\dashv	_
ELEC3212	Application of Electrical Materials				0	0									0					0										_
ELEC3211	High Voltage Engineering				0															0								\Box		_
ELEC6200	Part IV Group Design Project		-		0	0	0	0	0	0			0			0	0	0	0	0	0	0	0	0	0	0	\vdash	\vdash	-	0
COMP6202	Evolution of Complexity		H		6	╁	۲	۲	۲	۲						۳				0			H		H	H	Н	H	_	_
COMP6204	Software Project Management and Development			0	0															0										_
ELEC6201	Microfabrication		1		0	╄			-	-				0						0			\vdash		ш		Ш	\vdash	_	_
ELEC6202 ELEC6203	Introduction to MEMS		\vdash		0	+			\vdash	\vdash				0						0			\vdash		Н	H	\vdash	0	\dashv	—
ELEC6204	Microfluidics and Lab-on-a-Chip		T		0	T	0							ō						0			П		П	П	П	Ť	\neg	_
ELEC6205	Bionanotechnology				0		0							0						0								0		_
ELEC6217 ELEC6230	Radio Communications Engineering VLSI Systems Design		-		0	0							0	0	0			0		0		0	\vdash	0	Н	0	0	0	_	_
ELEC6237	System on Chip Electronic Design Automation		\vdash		6	10			\vdash	<u> </u>			0	0				0		0		0	\vdash	0	H	0	0	0	\dashv	_
ELEC6241	System on Chip Design Techniques				0									0						0								口		_
ELEC6245	Wireless Networks	_	F		0	1	\perp							0		F	\Box			0	0		Щ	0	\square	\vdash	Ш	П		0
MATH6111 MATH6115	Numerical Methods Statistics for Engineering Systems	0	\vdash		0	+	\vdash	\vdash	\vdash	\vdash			\vdash	\vdash	\vdash	\vdash	\vdash		Н	0	\dashv		\vdash		Н	\vdash	\vdash	$\vdash\vdash$	+	—
OPTO6007	Silicon Photonics	Ť		t^{-}	0	T	\perp												H	0					Н	Н		\Box	\dashv	_
COMP6206	Advanced Computer Vision		Г		0															0			П		П			П		_
COMP6208 COMP6210	Advanced Machine Learning Automated Software Verification	\vdash	\vdash	\vdash	0	+	0	-	\vdash	-				0	0				Н	0			\vdash		Ш	Ш	0	\vdash	\dashv	_
COMP6210 COMP6212	Computational Finance	\vdash	\vdash		0	+	0	\vdash	\vdash	\vdash		\vdash		0	0	\vdash			H	0			\vdash		Н	Н	0	\vdash	\dashv	—
COMP6228	Individual Research Project				0		ō		0	0								0		0	0	0		0				┌		0
ELEC6206	Nanofabrication and Microscopy		F		0		1		F	F				0			H			0			Д		П	Ħ	П	Д		_
ELEC6207 ELEC6208	Quantum Devices and Technology MEMS Sensors and Actuators		\vdash	\vdash	0	+	0	\vdash	-	\vdash	-		\vdash	0	\vdash				H	0	\dashv		\vdash		Н	H	\vdash	Н	+	—
ELEC6209	Practical Applications of MEMS		\vdash	\perp	0	$^{+}$	0	T						0	0					0			\Box		Н	Н	0	0	\exists	_
ELEC6210	Biosensors				0		0							0						0								0	\Box	
ELEC6212 ELEC6213	Biologically-Inspired Robotics		1		0	+	-	1	1	1				0	-	_	Н	0	Н	0	0	0	\vdash	0	Ш	\vdash	\square	\vdash	-	0
ELEC6213 ELEC6214	Image Processing Advanced Wireless Communication Networks and Systems	\vdash	\vdash	+	0	+		\vdash	\vdash	\vdash				0	\vdash				H	0			\vdash		Н	H	Н	Н	+	—
ELEC6215	Integrated RF Transceiver Design			I	0	厂	I	I						0						0			\Box		d	Ħ		d	〓	_
ELEC6216	Personal Multimedia Communications		Г		0		Ę							0						0	0		П	0				П	7	0
ELEC6227 ELEC6228	Medical Electrical and Electronic Technologies Applied Control Systems	\vdash	\vdash	-	0	+	0	-	-	\vdash	-		\vdash	0	\vdash	\vdash	\vdash		Н	0	0		\vdash		Н	\vdash	\vdash	\vdash	\dashv	0
ELEC6231	VLSI Design Project		\vdash		0	0			\vdash				0	0	0			0	H	0	_	0	\sqcap	0	H	0	0	Н	\dashv	Ť
ELEC6232	Analogue and Mixed Signal CMOS design				0	Ĺ								0	0					0							0			_
	Digital System Synthesis				0	F								0	0		Щ	_	П	0		_	口		П	٦	0	П		_
	System on Chip Design Project	 	\vdash	+	0	0	\vdash	\vdash	1	\vdash	-		0	0	0			0	Н	0	\dashv	0	\vdash	0	Н	0	0	Н	+	_
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ELEC6235 ELEC6242	Cryptography Photonic Materials				10		1																						-	_
ELEC6235 ELEC6242 OPTO6003 OPTO6004	Cryptography Photonic Materials Metamaterials, Plasmonics, and Nanophotonics			L	0															0								◨		_
ELEC6235 ELEC6242 OPTO6003 OPTO6004 OPTO6010	Cryptography Photonic Materials Metamaterials,Plasmonics, and Nanophotonics Advanced Fibre Telecommunication Technologies																			0										_
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ELEC6235 ELEC6242 OPTO6003 OPTO6004 OPTO6010 OPTO6011 ELEC6224	Cryptography Photonic Materials Metamaterials,Plasmonics, and Nanophotonics Advanced Fibre Telecommunication Technologies		0 0	0		0							0	0	0					0 0 0		0			0	0				_
ELEC6235 ELEC6242 OPTO6003 OPTO6004 OPTO6010 OPTO6011 ELEC6224 ELEC6225 ELEC6226	Cryptography Photonic Materials Metamaterials, Plasmonics, and Nanophotonics Advanced Fibre Telecommunication Technologies Optical Fibre Sensor Technologies Advanced Electrical Materials High Voltage Insulation Systems Power Electronics for DC Transmission		0	0	0 0 0	0							0			0				0 0		0				0				_ _ _ _
ELEC6233 ELEC6235 ELEC6242 OPTO6003 OPTO60004 OPTO6010 OPTO6011 ELEC6224 ELEC6225 ELEC6226 ELEC6220 ELEC6221	Cryptography Photonic Materials Metamaterials,Plasmonics, and Nanophotonics Advanced Fibre Telecommunication Technologies Optical Fibre Sensor Technologies Advanced Electrical Materials High Voltage Insulation Systems	0	0		0	0	0						0	0 0	0	0	0			0	0	0			0	0	0		0	

Appendix: Assessment table

The information in this table is valid at the time of compilation of this document, but should be checked against the relevant course Web page for last-minute changes.

Module Code	Module Title	Coursework 1	Coursework 2	Coursework 3	Coursework 4	Coursework 5	Exam
ELEC1206	Electrical	20% - Practical	5% - Maths				15% - Exam, 1 hour(s)
	Materials and	Lab Sessions	tests and in-				60% - Exam, 2 hour(s)
	Fields		class test				
MATH1055	Mathematics for	20% -					10% - Exam, 1 hour(s)
	Electronic and	Coursework					70% - Exam, 2 hour(s)
	Electrical	mark generated					,
	Engineering I	from 18 tests at					
		end of each					
		weekly topic.					
ELEC1200	Electronic Circuits	20% - Practical	15% - Lab	30% -	35% - In Class		
		Lab Sessions	project	Problem	Test		
			' '	Sheets			
ELEC1201	Programming	20% - Practical	25% - Practical	15% - Project	40% - Two in-		
		Lab Sessions: C	Lab Sessions:		class tests.		
		Programming	Embedded C				
			Programming				
ELEC1202	Digital Systems &	20% - Practical	10% - Design	10% -			60% - Exam, 2 hour(s)
	Microprocessors	Lab Sessions	Exercise	Problem			
	Wile oprocessors	200 30330113	Exercise	Sheets			
ELEC1204	Advanced	30% - Practical	30% -	Silects			40% - Exam, 1.5 hour(s)
	Programming	Lab Sessions	Collaborative				ion Exam, 1.5 near(s)
	1 TOBIUM MINI	Edb 303310113	Project				
ELEC1205	Solid State	20% - Practical	10% -				70% - Exam, 2 hour(s)
LLLCIZOS	Electronics	Lab Sessions	Coursework				7070 Exam, 2 noun(3)
	Licetroffics	Edb 303310113	Assignment				
ELEC1207	Electronic	20% - Practical	10% -				70% - Exam, 2 hour(s)
LLLCIZO7	Systems	Lab Sessions	Coursework				7070 - Exam, 2 moun(s)
	Systems	Edb 303310113	Assignment				
ELEC1203	Mechanics	10% - Practical	5% - Problem	10% -			75% - Exam, 2 hour(s)
LLLCIZOS	Wiecharics	Lab Sessions	sheet on	Problem			7570 - Exam, 2 mour(s)
		Lab Sessions	dynamics of	sheet on			
			particles	statics and			
			particles	dynamics of			
				rigid bodies			
ELEC2219	Electromagnetism	15% - Practical	17.5% -	17.5% -			50% - Exam, 2 hour(s)
LLLCZZIG	for EEE	Lab Sessions	Coursework	Coursework			30% - Exam, 2 mour(s)
ELEC2220	Control and	15% - Practical	10%	Coursework			75% - Exam, 2 hour(s)
LLLCZZZZO	Communications	Lab Sessions	Coursework				73% - Exam, 2 moun(s)
ELEC2221	Digital Systems	15% - Practical	15% -				70% - Exam, 2 hour(s)
LLLC2221	and Signal	Lab Sessions	Coursework				7070 - LAGIII, 2 IIUUI(S)
	Processing	ran acasiniis	Coursework				
MATH2047	Mathematics for	20% -		+		1	80% - Exam, 2 hour(s)
IVIA I П2U47		20% - Coursework					ou% - Exam, z nour(S)
	Electrical & Electronic	Coursework					
FLFC2204	Engineering II	5% - Practical	100/	1			000/ Evam 2 h = :::/=\
ELEC2201	Devices		10% -				85% - Exam, 2 hour(s)
ELEC2204	Committee	Lab Sessions	Coursework	1			700/ Fuere 2 to 1/2)
ELEC2204	Computer	20% - Practical	2% - In Class				78% - Exam, 2 hour(s)
515005:-	Engineering	Lab Sessions	Test	1		ļ	
ELEC2217	EEE Design	30% - D2	70% Smart				
		Integrated	power design				
		circuit design	exercise				
		exercise					

ELEC2222	Circuits and	15% - Practical	20% -			65% - Exam, 2 hour(s)
	Transmission	Lab Sessions	Coursework			
ELEC2208	Power Electronics	5% - Practical	10% -		1	70% - Exam, 2 hour(s)
	and Drives	Lab Session	Coursework			
ELEC2216	Advanced	10% - Practical	10% -			80% - Exam, 2 hour(s)
	Electronic	Lab Sessions	Coursework			
	Systems					
ELEC2213	Electrical	10% - Practical	20% -			70% - Exam, 2 hour(s)
	Machines	Lab Sessions	Coursework			
ELEC2206	Materials					100% - Exam. 2 hour(s)
		100% - Project				. ,
ELEC3200	Year in Industry	report				
	,	10% - Progress	80% - Final	10% - Viva		
COMP3200	Individual Project	Report	Report			
		5% -	20% -			75% - Exam, 2 hours
		Coursework	Coursework			7 576 274, 264.5
		Assignment	Assignment			
		Identify faults in	Identify and fix			
		web based	faults in web			
COMP3201	Cyber Security	security	based security			
	-,	30% - 3 x small	20% - Large			50% - Exam, 2 hours
COMP3206	Machine Learning	courseworks	coursework			5570 Examp E Hours
	Real-time	30% - Real-time	350.50HOIR			70% - Exam, 2 hours
	Computing and	laboratories				7076 - EXAM, 2 HOUIS
	Embedded	laboratories				
COMP3215						
COMPSZIS	Systems	25% - Kinematic				75% - Exam, 2 hours
						75% - Exam, 2 nours
		design and				
ELEC2201	Dahatia Cuatana	analysis of				
ELEC3201	Robotic Systems	robotic systems				1000/ 5 2.51
5150000	Digital Coding and					100% - Exam, 2.5 hours
ELEC3203	Transmission					
	Control System	20% - 4				80% - Exam, 2 hours
ELEC3205	Design	problem sheets				
		30% - SILVACO				70% - Exam, 2 hours
	Nanoelectronic	finite element				
ELEC3207	Devices	simulation				
	Signal and Image					100% - Exam, 3 hours
ELEC3218	Processing					
	Digital IC and	10% - L-Edit	10% - Digital			80% - Exam, 2.5 hours
ELEC3221	Systems Design	Gate Design	Systems Design			
	Computer	30% - Group				70% - Exam, 2 hours
ELEC3222	Networks	coursework				
		33% - Formative	33% -	33% -		
		coursework	Summative	Formative		
		assessing	computer	coursework		
		Accounting for	mediated	assessing		
		Engineering	testing	Managerial		
		Decision	assessing Law in	Decisions,		
		Making	Engineering	Marketing,		
				Human		
				Resource		
				Management		
	Engineering			and		
	Management and			Entrepreneur		
MANG3067	Law			ship		
		20% - Group				80% - Exam, 2 hours
	Operational	Coursework				•
MATH3081	Research	assignment				
	Advanced Partial	20% -				80% - Exam, 2 hours
	Differential	Coursework				. , =
MATH3083	Equations					
		30% - short	40% - major	30% - Best		
	Computational	assignments	assignment	two of three		
COMP3212	Biology	222.6	222.6	in-class		
	2.2.201	1	1	5.455	I	

10% - Two 3 10% - 5% - 25% - 3D world	50% - Exam, 1.5 hours 70% - Exam, 2 hours 20% - Exam, 1 hour 70% - Exam, 2 hours
hour labs introduction to OpenGL to physics Simulation, based using OpenGL and modeling coursework COMP3214 Graphics Graphics Graphics COMP3216 Systems COMP3217 Secure Systems ELEC3202 Green Electronics Wireless and Optical Modeling to physics Simulation, based using OpenGL and modeling coursework where appropriate Safety-Critical 30% - Coursework COMP3217 Secure Systems Sow - Labs Sow - Photovoltaic exercise Som - Space time coding parametrisation and design in Matlab Wireless and Optical Modelling of to physics Simulation, to physics based using OpenGL and modeling coursework Simulation, to physics Simulation, using OpenGL and modeling coursework Simulation, to physics simulation, using OpenGL and modeling coursework Simulation, using OpenGL and modeling coursework Simulation, to physics simulation, using OpenGL and modeling coursework Safety-Critical 30% - Coursework	70% - Exam, 2 hours 20% - Exam, 1 hour
Principles and level 2D and level 2D and basic 3D Computer Computer Graphics Graphics Graphics Systems Coursework Systems Sow - Labs ELEC3202 Green Electronics Sow - Systems Sow - Space time coding parametrisation and design in Optical Matlab Matlab Graphics Giasing OpenGL and modeling where and modeling coursework using OpenGL and modeling where and modeling coursework using OpenGL and modeling where appropriate and modeling where appropriate Safety-Critical 30% - Coursework Systems Coursework Sow - Labs Sow - Labs Sow - Labs Sow - Labs Sow - Space time coding parametrisation and design in Matlab Gibre dispersion in Simulation, using OpenGL and modeling where and modeling where some coursework Simulation, using OpenGL and modeling where and modeling where appropriate Simulation, using OpenGL and modeling where some simulation should be supported to the propriate Simulation should be supp	20% - Exam, 1 hour
Principles and Practice of basic 3D Computer Computer Graphics Graphics Safety-Critical Systems Coursework COMP3217 Secure Systems 80% - Labs 30% - Photo-Voltaic exercise Coding parametrisation and design in Optical Matlab Matlab Coursework Where appropriate and modeling coursework where appropriate Secure Systems Appropriate Secure Systems Appropriate Secure Systems Source S	20% - Exam, 1 hour
Practice of Computer Computer Graphics Graphics Safety-Critical Systems Coursework COMP3217 Secure Systems 80% - Labs 30% - Photovoltaic exercise S% - OFDM parametrisation and design in Wireless and Optical Matlab Matlab modeling coursework where appropriate where appropriate where appropriate should be coursework where appropriate appropriate should be coursework where appropriate should be coursework where appropriate should be coursework source should be coursework where appropriate should be coursework should be compacted by the course should be compacted by the course should be coursework should be coursework should be compacted by the course shoul	20% - Exam, 1 hour
COMP3214 Computer Graphics Graphics Safety-Critical COMP3216 Systems COMP3217 Secure Systems Sofeen Electronics Green Electronics Systeme Systems Soference Systems Soferen	20% - Exam, 1 hour
COMP3214 Graphics Graphics appropriate Safety-Critical 30% - COMP3216 Systems Coursework COMP3217 Secure Systems 80% - Labs 30% - Photo- voltaic exercise 5% - OFDM parametrisation and design in Matlab Wireless and Optical Matlab Graphics appropriate	20% - Exam, 1 hour
Safety-Critical 30% - COMP3216 Systems Coursework COMP3217 Secure Systems 80% - Labs ELEC3202 Green Electronics voltaic exercise 5% - Space time coding parametrisation parametrisation and design in Matlab Wireless and Optical Matlab Matlab Systems Coursework S0% - Labs S0% - Photo-voltaic exercise 5% - OFDM 5% - Modelling of material and fibre dispersion in	20% - Exam, 1 hour
Safety-Critical 30% - COMP3216 Systems Coursework COMP3217 Secure Systems 80% - Labs ELEC3202 Green Electronics Voltaic exercise 5% - Space time coding parametrisation and design in Matlab Wireless and Optical Matlab Systems Coursework 80% - Labs 5% - OFDM 5% - parametrisation and design in Matlab fibre dispersion in	20% - Exam, 1 hour
COMP3216 Systems Coursework Secure Systems 80% - Labs 30% - Photo-voltaic exercise Systeme Coding parametrisation and design in Optical Matlab Coursework Secure Systems Sow - Labs Sow - L	20% - Exam, 1 hour
COMP3217 Secure Systems 80% - Labs 30% - Photo- voltaic exercise 5% - Space time coding parametrisation parametrisation and design in Optical 80% - Labs 30% - Photo- voltaic exercise 5% - OFDM parametrisation and design in Matlab 5% - Modelling of material and fibre dispersion in	
ELEC3202 Green Electronics voltaic exercise 5% - Space time coding parametrisation and design in Matlab Wireless and Optical Matlab 30% - Photovoltaic exercise 5% - OFDM 5% - Modelling of material and fibre dispersion in	
ELEC3202 Green Electronics voltaic exercise 5% - Space time coding parametrisation and design in Optical Matlab 5% - OFDM parametrisation and design in Matlab 5% - OFDM parametrisation and design in material and fibre dispersion in	, one many means
5% - Space time coding parametrisation and design in Optical Matlab 5% - OFDM parametrisation and design in Matlab 5% - Modelling of material and fibre dispersion in	
coding parametrisation and design in Optical parametrisation and design in Matlab Matlab Modelling of material and fibre dispersion in	85% - Exam, 2.5 hours
parametrisation and design in material and fibre Optical Matlab dispersion in	03% Exam, 2.3 nours
Wireless and and design in Matlab fibre Optical Matlab dispersion in	
Optical Matlab dispersion in	
	4000/ 5 2
Digital Control	100% - Exam, 2 hours
ELEC3206 System Design	000/ 5 01
Analogue and 10% - Analogue	90% - Exam, 2 hours
Mixed Signal Circuit Design	
ELEC3208 Electronics coursework	
ELEC3217 Photonics	100% - Exam, 2.5 hours
Advanced 35% -	65% - Exam, 2 hours
Computer Architecture	
ELEC3219 Architecture simulation	
Integral 20% -	80% - Exam, 2 hours
Transform Coursework	
MATH3084 Methods	
20% -	80% - Exam, 2 hours
MATH3082 Optimization Coursework	,
Power Systems 10% - 10% -	80% - Exam, 2 hours
ELEC3214 Technology Coursework Coursework	30% Exam, 2 mans
50% -	50% - Exam, 2 hours
Coursework on	30% - Exam, 2 mours
Power Systems power system ELEC3213 Engineering stability	
	659/ Even 3 hours
Application of 15% - 10% - Problem 10% -	65% - Exam, 2 hours
Electrical Coursework sheet Problem	
ELEC3212 Materials sheet	
High Voltage	100% - Exam, 2 hours
ELEC3211 Engineering	
50% - Design 50% - Design	
Thinking Study	
ELEC3210 Design Studies Exercise	
50% - Group 10% - Group 10% - 30% -	
Report Presentation Individual Individual	
Reflection Report and	
Poster on Poster on	
Group Design Business Case	
ELEC6200 Project Study	
0% - code a 50% -	50% - Exam, 1.5 hours
genetic reimplement a	
Evolution of algorithm selected paper	
COMP6202 Complexity and extend	
Software Project 25% - Project	75% - Exam, 2 hours
Management and Management	, , ,
COMP6204 Development Plan	
	70% - Exam, 2 hours
130% -	7070 - LAGIII, 2 110UIS
30% -	
Fabrication	
ELEC6201 Microfabrication report	F00/ Figure 2 h
Fabrication	50% - Exam, 2 hours

Storage		1	T	1	1	
Introduction to blobratory Septent Septe		Storage	and lab report			
ELECE203 MS/MS report						70% - Exam, 2 hours
Automated Software			•			
BELCG204	ELEC6203	MEMS				
ELCG204 Lab-on-a-Chip						70% - Exam, 2 hours
ELECS204 Monachip						
BLCG004 Lab on a Chip						
ELEC6205 Y						
Bionanotechnolog Information Figure Figu	ELEC6204	Lab-on-a-Chip				
ELEC6205 Y						70% - Exam, 2 hours
SK- Software LSK- Software		Bionanotechnolog	<u> </u>			
Radio Communications Engineering 25% - Mini design assignments with electronic system Obesign ElEC6237	ELEC6205	У	report			
Radio			5% - Software	15% - Matlab	50% -	30% - Exam, 1 hour
ELEC6217 Engineering 25% - Mini			defined radio	simulation	Transceiver	
ELEC6217 Engineering 25% - Min 25%		Radio	exercise		System	
25%-Mini design assignments with informal with formal assignments with informal with formal assignments with informal assignments with informal assignments with informal and log book assessment) ELECG230 Design Colors of designs SW- Poligital IC IC Design LIC Design LIC Design LIC Design LIC Design Design Colors of LIC Design L		Communications			Design (group	
design assignments with electronic submission of designs (design)	ELEC6217	Engineering				
Automation System on Chip Design System on Chip Electronic System on Chip Electronic System on Chip Electronic Design Softs - Analogue Electronic Design Design Softs - Analogue Electronic Design Desi			25% - Mini	75% - Design	25% - Lab	
WLSI Systems on Chip ELECG237 System on Chip Design Soft-Analogue ELECG237 Automated Computer Vision C			design	assignments	(attendance	
VLSI Systems			assignments	with formal	and log book	
ELECG230 Design System on Chip Electronic Design Sow - Analogue Sow - Digital IC Design Electoratic Design Sow - Analogue Sow - Digital IC Design Electoratic Design D			with electronic	documentation	assessment)	
ELECG327		VLSI Systems	submission of			
ELECC6241 Techniques	ELEC6230	Design	designs			
ELEC6237		System on Chip	50% - Analogue	50% - Digital IC		
System on Chip Design De		Electronic Design	IC Design	design		
Design Techniques Techniq	ELEC6237	Automation				
ELEC6241 Techniques Wireless 20% - Tutorial 80% - group Coursework		System on Chip				100% - Exam, 2 hours
Metworks Presentation Presenta		Design				
ELEC6245 Networks presentation coursework 60% - Exam, 2.25 hours MATH6141 Methods assignments 60% - Exam, 2.25 hours MATH6141 Methods assignments 75% - Exam, 2 hours Engineering Engineering Engineering Engineering Engineering Systems Coursework 75% - Exam, 2 hours MATH6148 Systems 75% - Exam, 2 hours OPT06007 Silicon Photonics 55% - 2 work 80% - Exam, 2.5 hours OPT06008 Optical Fibre Technology I and problem and problem Sheets and problem Technology II 80% - Exam, 2.5 hours OPT06009 Advanced Computer Vision 66% - Lecture Advanced Research Machine Learning 40% - Group coursework 66.7% - Exam, 2 hours COMP6208 Machine Learning Research Research Machine Learning 55% - Model checking exercise using collected in using an OO CMM of ware verification tool 70% - Exam, 2 hours COMP6210 Verification Computer labs 57% - Literature verification tool 10% - Four tool COMP6210 Computational Individual 10% - four computer labs 25% - Poster	ELEC6241	Techniques				
ELEC6245 Networks presentation coursework 60% - Exam, 2.25 hours MATH6141 Methods assignments 60% - Exam, 2.25 hours MATH6141 Methods assignments 75% - Exam, 2 hours Engineering Engineering Engineering Engineering Engineering Systems Coursework 75% - Exam, 2 hours MATH6148 Systems 75% - Exam, 2 hours OPT06007 Silicon Photonics 55% - 2 work 80% - Exam, 2.5 hours OPT06008 Optical Fibre Technology I and problem and problem Sheets and problem Technology II 80% - Exam, 2.5 hours OPT06009 Advanced Computer Vision 66% - Lecture Advanced Research Machine Learning 40% - Group coursework 66.7% - Exam, 2 hours COMP6208 Machine Learning Research Research Machine Learning 55% - Model checking exercise using collected in using an OO CMM of ware verification tool 70% - Exam, 2 hours COMP6210 Verification Computer labs 57% - Literature verification tool 10% - Four tool COMP6210 Computational Individual 10% - four computer labs 25% - Poster		Wireless	20% - Tutorial	80% - group		
MATH6141 Numerical Coursework assignments MATH6148 Statistics for Engineering Systems MATH6148 OPTO6007 Silicon Photonics OPTO6008 Optical Fibre Technology I Optical Fibre Technology I Optical Fibre Computer Vision OPTO6009 COMP6206 COMP6206 COMP6207 Advanced Machine Learning Research Machine Learning Automated Software COMP6210 Automated Software Computer Iabs COMP6210 COMP6210 COMP6210 COMP6210 COMP6210 COMP6210 COMP6210 COMP6210 COMP6210 COMPG210 COM	ELEC6245	Networks	presentation			
MATH6141 Numerical Coursework Assignments Systems Statistics for Engineering Systems						60% - Exam. 2.25 hours
MATH6141 Methods assignments — 75% - Exam, 2 hours Bastistics for Engineering Systems 25% - Coursework — 75% - Exam, 2 hours MATH6148 An Introduction to Systems 25% - 2 work — 75% - Exam, 2 hours OPT06007 Silicon Photonics sheets — 80% - Exam. 2.5 hours Optical Fibre Technology I Assignments and problem sheets — — 80% - Exam. 2.5 hours OPT06008 — Advanced 60% - Lecture and problem sheets — — — OPT06009 Advanced 60% - Lecture and problem sheets — — — OPT06009 Advanced 60% - Lecture and problem sheets — — — OPT06009 Advanced 60% - Lecture and problem sheets — — — OPT06009 Advanced Research — — — — COMP6210 Advanced Report — — — — — — COMP6210 Verification —		Numerical				, , , , , , , , , , , , , , , , , , , ,
Statistics for Engineering Coursework Systems An Introduction to Silicon Photonics Sheets Optical Fibre Technology I OPTO6007 OPTO6008 OPTO6009 Advanced Computer Vision material Complete In explicit state model checking Automated Software COMP6210 COMP6210 COMP6210 Computational Computer Individual Statistics for Engineering Coursework Coursework Computer Individual Search, Interim Search, Interim Coursework Coursework Interim Course Computer Individual Statistics for Coursework Coursework Interim Search, Interim Coursework Interim Coursework Interim Coursework Interim Coursework Individual Search, Interim Coursework Interim Coursework Interim Coursework Individual Individual Individual Individual Interim Coursework Interim Coursewor	MATH6141					
MATH6148 Engineering Systems Coursework Systems Coursework Systems Coptical Fibre Technology I Computer Vision Advanced COMP6208 Machine Learning Automated Software Software COMP6210 Verification Computer labs Co						75% - Fxam 2 hours
MATH6148 Systems						7976 276, 2 1166.15
An Introduction to 25% - 2 work sheets	MATH6148					
OPTO6007 Silicon Photonics sheets 20% - Assignments and problem Technology I sheets 20% - Assignments and problem Sheets 20% - Exam. 2.5 hours 20% - Exam. 2.5 hours 20% - Exam. 2 hours 20% - Exam.		<u> </u>	25% - 2 work			75% - Exam. 2 hours
OPTO6008 Optical Fibre Technology I OPTO6008 OPTO6009 Assignments and problem sheets OPTO6009 OPTO6009 Advanced Computer Vision material coursework Advanced Research Report Advanced Machine Learning Problem in explicit state model checking exercise in explicit state model Software COMP6210 COMP6210 Computational Computer labs Technology I Sheets Advanced Computer Vision material coursework Besearch Research Report Advanced Research Report COMP6210 Computational Computer labs Tomposite of the course of the cour	OPTO6007					7976 276, 2 1166.15
OPTO6008 Optical Fibre Technology I Sheets OPTO6009 Advanced Computer Vision Macrial Coursework COMP6206 COMP6207 Advanced Research Report I 10% - Exercise in explicit state model checking exercise using CBMC Software COMP6210 Verification COMP6210 Verification COMP6211 Finance Topical Fibre Technology I Sow - Advanced Advanced Research Research CBMC Software verification tool COMP6212 Finance Topical Fibre Technology I Sow - Exam. 2.5 hours A0% - Exam. 2 hours Finance Software verification tool Topical Fibre Technology I Sow - Exam. 2 hours Finance Software verification Topical Fibre Technology I Sow - Exam. 2 hours Finance Software verification Topical Fibre Technology I Sow - Exam. 2 hours Finance Software verification Topical Fibre Technology I Sow - Exam. 2 hours Finance Software Verification Topical Fibre Technology I Sow - Exam. 2 hours Finance Software Verification Topical Fibre Technology I Sow - Exam. 2 hours Finance Software Verification Topical Fibre Technology I Sow - Exam. 2 hours Finance Software Verification Topical Fibre Technology I Sow - Exam. 2 hours Finance Software Verification Topical Fibre Technology I Sow - Exam. 2 hours Finance Software Verification Topical Fibre Technology I Sow - Exam. 2 hours Finance Software Verification Topical Fibre Technology I Sow - Exam. 2 hours F	0. 100007	Gcom T. Tiotorinos				80% - Fxam 2.5 hours
OPTO6008 Optical Fibre Technology I sheets OPTO6009 OPTO6009 Advanced Computer Vision material coursework Advanced Research Report I material model checking exercise in explicit state model checking overflication tool COMP6210 COMP6210 COMP6210 COMP6211 COMP6212 Automated Software Computer I individual Optical Fibre sheets 20% - Assignments and problem sheets 40% - Group devision 40% - Group devision Advanced Research Report Computer Vision 10% - Exercise in explicit state model checking exercise in using an OO software verification tool COMP6212 Individual Automated Software computer labs 75% - Literature search, interim 25% - Poster 25% - Poster 25% - Poster						CO/C EXCITI 2.5 Hours
OPTO6008 Technology I sheets Optical Fibre Technology I sheets OPTO6009 Advanced Computer Vision material coursework Advanced Research Machine Learning Part Individual Automated Software COMP6210 COMP6212 Technology I Sheets Advanced Advanced Research Report Individual Sheets Advanced Research Report Individual Sheets Advanced Research Report Automated Software Computer Vision Town computer labs Technology I Sheets Advanced Advanced Research Report Automated Software Computational Computer labs Technology I Sheets Advanced Advanced Research Report Sheets Advanced Research Report Town - Exam, 2 hours Town -		Ontical Fibre	_			
OPTO6008 Optical Fibre Assignments and problem Sheets Optical Fibre Technology I I Sheets OPTO6009 Advanced Computer Vision Macrial Salary Coursework COMP6206 COMP6208 Advanced Research Machine Learning Report In explicit state model checking Software Software Computational Composition of Computational Computational Finance Computer labs COMP6210 Individual Optical Fibre Assignments and problem Sheets Advanced Go% - Lecture A0% - Group coursework Advanced Research Research Software Software verification tool Software Software Software Software search, interim Software Software Software search, interim ZSW - Poster Software Software Software search, interim Software Software Software search, interim Software Software Software Software search, interim Software Software Software Software search, interim Software Software Software Software search, interim		· ·				
OPTO6009 OPTO6009 Advanced Computer Vision material coursework COMP6206 Machine Learning Report Automated Software COMP6210 COMP6210 Verification COMP6212 Finance Individual Assignments and problem sheets Advanced 60% - Lecture 40% - Group coursework 5% - Model checking exercise in exercise in using an OO software verification tool COMP6210 Verification 70% - Exam, 2 hours 1 course 70% - Exam, 2 hours 1 course 2 course 2 course 2 course 2 course 2 course 3 course 4 course	OPTOGOOS	reciliology	Sileets			
Advanced COMP6208	01 100000		20%			909/ Evam 3 E hours
OPTO6009 Advanced Computer Vision and problem sheets COMP6206 Machine Learning Report Automated Software Software COMP6210 Verification COMP6212 Finance OPTO6009 Advanced Advanced Report Material COMP6212 Finance Advanced Report Machine Learning Report Power of the problem of the problem sheets Advanced Research Report Power of the problem sheets Advanced Research Report Power of the problem sheets Advanced Research Report Power of the problem sheets Soft- Model Soft- Exam, 2 hours Soft- Exam, 2 hours Soft- Exam, 2 hours Finance Soft- Exam, 2 hours Soft- Exam, 2 hours Soft- Exam, 2 hours Finance Soft- Exam, 2 hours Soft- Exam, 2 hours Soft- Exam, 2 hours Finance Soft- Exam, 2 hours Soft- Exam, 2 hours Town- Exa						80% - Exam. 2.3 mours
Technology I I sheets		Ontical Fibro	_			
OPTO6009 Advanced COMpter Vision material coursework Advanced Research Report 10% - Exercise in explicit state model checking Software COMP6210 COMP6210 COMP6210 COMputational Computational Individual Advanced Research Research Report 10% - Exercise CBMC Software verification tool COMP6212 Individual Advanced Research Research Research Report 10% - Exercise S% - Model tocking exercise in using an OO software verification tool COMP6210 COMP6210 Individual Advanced Research Resea			=			
Advanced Computer Vision material coursework 33.3% - Advanced Research Machine Learning Report 10% - Exercise in explicit state model checking Automated Software COMP6210 Verification COMP6212 Finance Advanced Research Research Report 10% - Exercise in explicit state model checking exercise using constitution tool Computational Computer labs 75% - Literature search, interim 40% - Group exercise in using an OO software verification tool 25% - Poster 25% - Poster	ODTO6000	reciliology i i	Sileets			
COMP6206 Computer Vision material coursework 66.7% - Exam, 2 hours Advanced Research Report 66.7% - Exam, 2 hours Machine Learning Report 70% - Exam, 2 hours Town - Exam, 2	OP100009	Advensed	C00/ 1 turns	400/ 6		
Advanced Research Report 10% - Exercise in explicit state model checking exercise using COMP6210 Computational COMP6212 Finance Town - Exercise search, interim Town - Exercise search, interim Town - Exercise search Town - Exam, 2 hours Finance Fina	COMPCIO					
Advanced Machine Learning Report	COMP6206	Computer vision		coursework		56.70/ 5
COMP6208 Machine Learning Report						66.7% - Exam, 2 hours
Tow- Exam, 2 hours 10% - Exam, 2 hours 10% - Exam, 2 hours 70% - Exam, 2 hours						
in explicit state model checking exercise in using an OO software verification tool COMP6210 Verification COMP6212 Finance Individual Individual In explicit state model checking exercise in using an OO software verification tool CBMC software verification tool Tool Individual Individual In explicit state model checking exercise in using an OO software verification tool Software verification tool Individual Ind	COMP6208	Machine Learning	•			
Automated Software CDMP6210 Verification COMP6212 Finance Computer labs Townstance Computational Individual Search, interim Townstance CBMC Software verification tool Computer labs Townstance CBMC Software verification tool Computer labs Townstance CBMC Software verification tool C					-	70% - Exam, 2 hours
Automated Software COMP6210 Verification COMputational Finance Individual Automated Software verification tool Computational Finance Software verification tool Tool Software verification tool Tool Tool Software Verification Tool Tool Software Verification Tool Tool Software Verification Tool Softw			· · · · · · · · · · · · · · · · · · ·	_		
Software Verification Verification COMP6210 Computational Finance Individual Software Verification tool Verification tool Verification tool Software Verification tool Verification tool Software Verification tool Software Verification tool Software Verification Software Sof			model checking			
COMP6210 Verification tool tool Computational 100% - four computer labs Townstance computer labs Townstance 25% - Poster search, interim				CBMC		
COMP6212 Computational 100% - four computer labs 75% - Literature search, interim COMP6212 Finance Computer labs		Software			verification	
COMP6212 Finance computer labs 75% - Literature search, interim Computer labs 75% - Literature search, interim	COMP6210				tool	
75% - Literature 25% - Poster Individual search, interim		Computational	100% - four			
Individual search, interim	COMP6212	Finance	computer labs			
			75% - Literature	25% - Poster		
		Individual	search, interim			
	COMP6228					

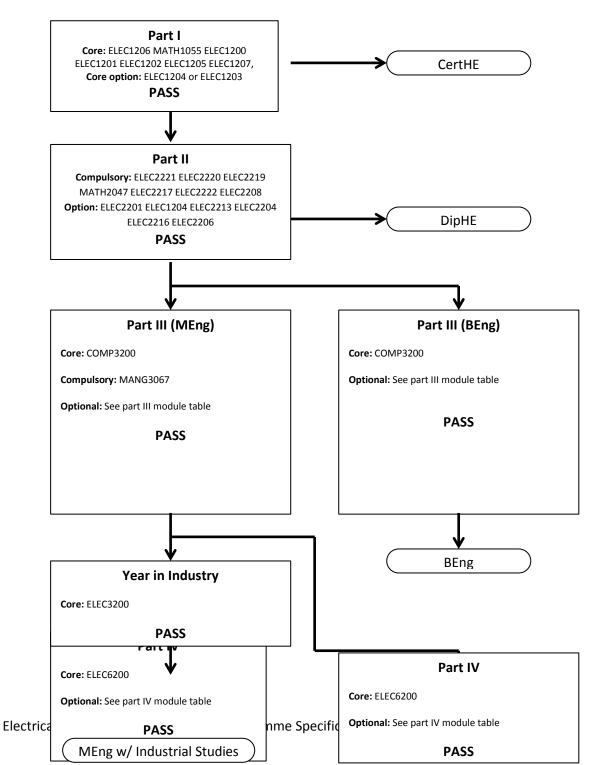
		30% - Report					70% - Exam, 2 hours
		about					
	Nanofabrication	lithography					
ELEC6206	and Microscopy	simulation lab					
		50% - Advance					50% - Exam, 2 hours
	Quantum Devices	logic device and					
ELEC6207	and Technology	lab report					
		25% - Sensing	25% -	25% - RF	25% - MEMS		
		and Actuation	Interfacing with	MEMS	Lab report		
	MEMS Sensors		Sensors and				
ELEC6208	and Actuators		Actuators				
		10% - Two lab	30% -	30% -	30% -		
		sessions	Assignment 1:	Assignment	Assignment		
			research,	2: simulate,	3:		
			design, report	construct,	characterisati		
	Practical			report	on/test		
	Applications of				report and		
ELEC6209	MEMS				analysis		
		50% - Report on					50% - Exam, 2 hours
		laboratory					
		work, data					
		analysis and					
		literature					
ELEC6210	Biosensors	context					
		5%- Quality of	40%- Technical	30% -	20%-	5%- Individual	
		initial plan	execution	Documentati	Individual	reflection	
				on	contributions		
	Biologically-				to Wiki or		
ELEC6212	Inspired Robotics				video		
ELEC6213	Image Processing						100% - Exam, 2 hours
	Advanced						100% - Exam, 2 hours
	Wireless						
	Communication						
	Networks and						
ELEC6214	Systems						
	Integrated RF	25% - System					75% - Exam, 2 hours
	Transceiver	study					
ELEC6215	Design						
		100% - progress					
		report,					
	Personal	individual					
	Multimedia	presentation,					
ELEC6216	Communications	final report					
		50% - Report on	25% - Report on	25% - Report			
		Health Hazards	one existing	on new			
		of one	medical imaging	emerging			
		electrical/electr	technology and	medical			
		onic technology	approaches	technologies			
			being				
	Medical Electrical		considered for				
	and Electronic		improvement/d				
ELEC6227	Technologies		evelopment				
		30% -	50% - Group	10% -	10% - Written		
		Coursework	report of the	Seminar	critique of		
		sheet	experimental	presentation	another		
		associated with	component	session given	group's work		
	Applied Control	each of the 3		by each			
ELEC6228	Systems	control topics		group			
		20% - Milestone	75% - Design	5% -			
				Individual			
	VLSI Design	Submissions	Submission				
ELEC6231	VLSI Design Project	Submissions	Submission	Reflection			
ELEC6231	_	Submissions 25% - Design	Submission				75% - Exam, 2 hours
	Project		Submission				75% - Exam, 2 hours
ELEC6231 ELEC6232 ELEC6233	Project Analogue and	25% - Design	Submission 40% - Complex				75% - Exam, 2 hours 50% - Exam, 2 hours

		•		•			
	Synthesis	Power Lab	system				
			synthesis				
	Embedded	50% - picoMIPS					50% - Exam, 2 hour(s)
ELEC6234	Processors	synthesis					
	System on Chip	100% - Main					
ELEC6235	Design Project	Report					
		20% -					80% - Exam, 2 hours
		Cryptanalysis					Con Exam, 2 nours
ELEC6242	Cryptography	Investigation					
ELEC0242	1 11 - 1 1		350/				
	Modelling with	75% - 3 group	25% -				
	Differential	projects	coursework				
MATH6149	Equations						
		30% - 6 x 2					70% - Exam, 2 hours
	Photonic	pages					
OPTO6003	Materials						
	Metamaterials,	60% - 3000	40% - Problem				
	Nanophonics and	words	classes				
OPTO6004	Plasmonics						
		30% -					70% - Exam, 2 hours
	Introduction to	laboratory					
ELEC6203	MEMS	report					
LLLCOZOS	IVILIVIS	30% - Report on					70% - Exam, 2 hours
		· ·					70% - Exam, 2 nours
		simulation					
		laboratory and					
	Microfluidics and	technology					
ELEC6204	Lab-on-a-Chip	review					
		30% -					70% - Exam, 2 hours
	Bionanotechnolog	laboratory					
ELEC6205	у	report					
	Wireless	20% - Tutorial	80% - group				
ELEC6245	Networks	presentation	coursework				
	Computational	100% - four					
COMP6212	Finance	computer labs					
COIVII 0212	Tillatice	25% - Sensing	25% -	25% - RF	25% - MEMS		
	NATNAC COMMON	and Actuation	Interfacing with	MEMS	Lab report		
	MEMS Sensors		Sensors and				
ELEC6208	and Actuators		Actuators				
		50% - Report on					50% - Exam, 2 hours
		laboratory					
		work, data					
		analysis and					
		literature					
ELEC6210	Biosensors	context					
		25% - Two	50% - Final	25% -			
		Presentations	Presentation	Individual			
				reflection and			
	Biologically-			contribution			
ELEC6212	Inspired Robotics			document			
LLLCUZIZ	maphed Robotics	220/ Danart on	220/ Danart on				
		33% - Report on	33% - Report on	33% - Report			
		Health Hazards	one existing	on new			
		of one	medical imaging	emerging			
		electrical/electr	technology and	medical			
		onic technology	approaches	technologies			
			being				
	Medical Electrical		considered for				
	and Electronic		improvement/d				
ELEC6227	Technologies		evelopment				
	Power Systems	50% -					50% - Exam, 2 hours
ELEC6220	Analysis	Coursework					,
	Power	30% - Business	20% - Steam				50% - Exam, 2 hours
	Generation:		plant analysis	1			50% Exam, 2 mours
		plan for energy	piant analysis	1			
ELECC224	Technology and	generation		1			
ELEC6221	Impact on Society	250/ - :	250/ 5 /	-		-	500/ 5
	Transmission and	25% - Design	25% - Design				50% - Exam, 2 hours
ELEC6222	Distribution	project 1	project 2				

	Advanced	50% - Research	50% - Mini			
	Electrical	Review	project			
ELEC6224	Materials					
	High Voltage	60% - Bushing	40% - Partial			
	Insulation	Design	discharge			
ELEC6225	Systems		identification			
		34% - Report on	33% - Report on	33% - Report		
		the	power	on DC		
		characteristics	converters	Transmission		
	Power Electronics	of power		Links		
	for DC	semiconductor				
ELEC6226	Transmission	devices				

Appendix: Programme structure

This programme structure refers to the University of Southampton courses; please refer to the previous sections for information about the structure at USMC.



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

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
		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	Art Equipment and	
Materials	Materials: Drawing paper; painting materials;	
Equipment	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; stethoscopes;	
	Music Equipment and Materials	
	Photography:	
	Recording Equipment:	
IT	Computer Discs	
	Software Licenses	
	Hardware	
Clothing	Lab Coats	

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
	Protective Clothing:	
	Hard hat; safety boots; hiviz 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	Accommodation	
Abroad Programmes)	Insurance	
	Medical Insurance	
	Travel costs	
	Immunisation/vaccination costs	
	Disclosure and Barring Certificates or Clearance	
	Translation of birth	
	certificates	
	Other	
Conference expenses	Accommodation	

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
	Travel	
Optional Visits (e.g. museums, galleries)		
Professional Exams		
Parking Costs		
Anything else not covered elsewhere		

Revision History

- 1. November 2011, Paul Lewin first draft.
- 2. October 2012, Mark Zwolinski, Mark French, minor changes.
- 3. May 2014, Mark French, Updates to new Pt III/IV, updates to Pt II, adopted new programme specification template.
- December 2014, Rob Maunder, Some slight updates to MATHxxxx and OPTOxxxx modules. Correction to assessment of ELEC1201. Slight changes to the exam weighting in ELEC1207 and ELEC6242. Included transfer policy. Added ELEC3222. Updated ELEC6230 assessments and adopted some best practice from CS/SE.
- 5. January 2015, Rob Maunder, reweighted the assessment in ELEC2201, ELEC2216, ELEC3206 and ELEC6227.
- 6. Rob Maunder, 05 Feb 2015, Added optional modules ELEC6234, OPTO6008, OPTO6009, OPTO6010, OPTO6011
- 7. P. Rapisarda, 04 March 2015, Added core category in tables, corrected some typos, introduced disclaimers about assessment rules table.
- 8. P. Rapisarda, 30 March 2015, Changed "ELEC3210 Electromechanical Design" in "ELEC3210 Design Studies", updated tables of Learning Outcomes and Assessment. Also created entries for OPTO6010 and 6011 in Options Table (note: syllabus non-existing on web pages ORC, so impossible to fill in requirements, LOs, etc.).
- 9. P. Rapisarda, 31 March 2015, eliminated OPTO6010 and OPTO6011 modules in Options Table and Assessment Table (they require OPTO6008 and OPTO6009, which would already exhaust the number of possible external modules to be taken).
- 10. P. Rapisarda, 1 April 2015, updated information on options available at USMC (p. 7).
- 11. P. Rapisarda, 30th April 2015, updated assessment percentages ELEC2220 (p. 17).
- 12. P. Rapisarda, 7th May 2015, updated ELEC2221 assessment (p. 17).
- 13. P. Rapisarda, 26th August 2015, updated ELEC6221 and ELEC2219 assessment.
- 14. P. Rapisarda, 8^{th} September, updated ELEC6242 and ELEC6212 assessment.
- 15. CQA Team, 09th September, updated legal CMA requirements including Admission table.