School of Engineering and Technology

Title of Programme: BEng Honours in Electrical and Electronic Engineering

Programme Code: EIEE

Programme Specification

This programme specification is relevant to students entering:
 01 September 2013

Associate Dean of School (Academic Quality Assurance):
Andy Lewis

Signature

Programme Specification
BEng Honours in Electrical and Electronic Engineering
BEng Honours in Digital Communications and Electronics
BEng Honours in Digital Systems and Computer Engineering

This programme specification (PS) is designed for prospective students, enrolled students, academic staff and potential employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content for each module can be found in Definitive Module Documents (DMDs) and Module Guides.

Section 1

Awarding Institution/Body	University of Hertfordshire
Teaching Institution	University of Hertfordshire
University/partner campuses	College Lane
Programme accredited by	Institution of Engineering and Technology
Final Award	BEng Honours
All Final Award titles	Electrical and Electronic Engineering
	Digital Communications and Electronics
	Digital Systems and Computer Engineering
FHEQ level of award	6
UCAS code(s)	H600, H641, H651
Language of Delivery	English

A. Programme Rationale

The School of Engineering and Technology offers a variety of MEng/BEng degrees. This programme specification covers those under the banner of Electrical and Electronic Engineering. The programme has been developed to (i) satisfy the QAA Engineering Benchmark requirements (ii) to fulfil the initial academic requirements of UK-SPEC for CEng status and (iii) meet the professional employment needs of industry.

During the first year all students study a common portfolio of modules covering a broad range of topics necessary for professional Electrical and Electronics Engineering allowing flexibility for students to change their award pathway as they become more familiar with the opportunities available. The differentiating features of the Digital Communications and Electronics and the Digital Systems and Computer Engineering awards occurs in the latter part of level 5 and more fully at level 6.

BEng students who satisfy the MEng progression criteria at levels 4 and 5 are encouraged to consider transfer to the MEng in Digital Communications and Electronics or the MEng in Digital Systems and Computer Engineering.

The School has close contacts with a wide range of engineering companies and students are encouraged to take the sandwich option spending at least 48 weeks on industrial placement between levels 5 and 6.

Graduates can expect to gain employment across a wide range of industries that require the skills of an electrical and electronic engineer. These industries include communications, computing, manufacture, defence, aerospace and automotive. Alternatively graduates may continue their education to a post-graduate level and the University of Hertfordshire has a range of taught MSc or research awards that graduates may consider.

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B. Educational Aims of the Programme

The programme has been devised in accordance with the University's graduate attributes of programmes of study as set out in UPR TL03.

Additionally this programme aims to:
- provide high quality education in electrical and electronic engineering;
- provide an education for the individual which enhances his/her prospects of professional employment in engineering and business both in national and international industries;
- provide studies which are accredited by the Institution of Engineering and Technology;
- provide studies which develop an awareness of, and underpinning knowledge and understanding of a broad range of Electrical and Electronic Engineering areas of expertise;
- provide studies which enable the student to attain a specific expertise in a range of topics appropriate to their named award:
    - Digital Communications and Electronics students will particularly study modern digital aspects of communications.
    - Digital Systems and Computer Engineering students will particularly study digital and computer hardware, software and the hardware-software interface, including an insight into software engineering and methodologies.

C. Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills and other attributes in the following areas. The programme outcomes are referenced to the QAA benchmark statements for Engineering and the Framework for Higher Education Qualifications in England, Wales and Northern Ireland (2008), and relate to the typical student. Additionally, the SEEC Credit Level Descriptors for Further and Higher Education 2010 have been used as a guiding framework for curriculum design.

Knowledge and Understanding of:	Teaching/learning methods & strategies	Assessment
A1-The analytical methods employed by the student's chosen engineering discipline. A2- The fundamental engineering sciences appropriate to the student's chosen engineering discipline. A3-The design principles and design-to-build processes appropriate to the student's chosen engineering discipline. A4- The basic principles and environmental/ethical considerations of the business of engineering. A5-Professional engineering practice appropriate to the student's chosen engineering discipline.	Acquisition of knowledge and understanding is through the following approaches: Acquisition of A1 and A2 is through a combination of lectures, small group tutorials, coursework and laboratory work at levels 4 and 5 of the programme. Additional support is provided through the Mathematics Drop-in Centre. Specialist aspects of A2 are further developed at level 6. Acquisition of A3, A4 and A5 is through a combination of lectures, projects and coursework throughout the programme. Staff deploy a range of teaching and learning strategies in the most appropriate way for each individual module. This will vary depending on the subject nature of a particular module and the level of study. A more didactic	Knowledge and understanding are assessed through a combination of unseen examinations (A1, A2, A3 and A5) and in-course assessments (A1-A5) in the form of laboratory reports, essays and phase tests. Some aspects of A3 and A4 are assessed by design exercises and project reports and presentations. At level 6 some aspects of A5 are assessed by case study reports.

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	approach will tend to be adopted at lower levels, in particular for A1 and A2. An increasingly self-directed and interactive approach will be adopted at higher levels, particularly for A3, A4 and A5. Throughout, the learner is encouraged to undertake independent study both to supplement and consolidate what is being taught/learnt and to broaden their individual knowledge and understanding of the subject.	
Intellectual skills - able to:	**Teaching/learning methods & strategies**	**Assessment**
B1- Analyse and solve engineering problems using appropriate techniques. B2-Model and analyse relevant engineering systems. B3-Select appropriate computer based methods for engineering and communication. B4-Evaluate external influences on the design process. B5-Design appropriate systems, components or processes.	Intellectual skills are developed throughout the programme by the methods and strategies outlined for section A of the intended learning outcomes above, again moving from a more didactic approach to an increasingly self-directed and interactive approach at higher levels, particularly for B3, B4 and B5. Analysis, problem solving and modelling skills (B1 and B2) are further developed through tutorial work, laboratory work, in-course exercises and project work. Design and IT skills (B3-B5) are further developed through project work, design exercises and some case study work at level 6. Feedback is given to all students on all coursework produced. Throughout, the learner is encouraged to develop intellectual skills further by independent study.	Intellectual skills B1, B2 and B5 are assessed through unseen examination papers, laboratory reports and coursework related to in-course exercises. Intellectual skills B3 and B4 are assessed through project reports and presentations.
Practical skills - able to:	**Teaching/learning methods & strategies**	**Assessment**
C1-Apply analytical and modelling techniques to solve problems appropriate to the student's chosen engineering discipline. C2-Perform experimental work and draw conclusions. C3-Use computer-based	Practical skills are developed throughout the programme by the methods and strategies outlined in sections A and B of the intended learning outcomes above, again moving from a more didactic approach to an increasingly self-directed and interactive approach at higher levels, particularly for C4, C5 and	Practical skills are assessed through laboratory reports, coursework assignments, design exercise submissions, case study reports, presentations and project reports.

	engineering tools.	C6.

		C6.
	C4-Prepare technical documentation.	C1 is developed through laboratory work, coursework assignments and tutorial work.
	C5-Evaluate the design of systems, components or processes appropriate to the student's chosen engineering discipline.	C2 is developed through laboratory work.
		C3 is developed through the use of software simulation tools at all levels.
	C6-Plan and manage a project, taking into account commercial and industrial constraints.	C4 is developed through project work, lab exercises and software documentation, particularly at level 4.
		C5 is developed through lab. work at levels 5 and 6.
		C6 is developed through lectures and project work.
		Feedback is given to all students on all coursework produced.

Transferable skills - able to:	Teaching/learning methods & strategies	Assessment
D1-Communicate effectively, both orally and in writing.	Transferable skills are developed throughout the programme by the methods and strategies outlined in sections A, B and C of the intended learning outcomes above.	Transferable skills are assessed through the following approaches:
D2-Use commonly available IT tools.		D1, D2, D5 and D6 are assessed though coursework, individual major project and technical reports and oral presentations.
D3-Manage time and resources effectively.	D1 is developed through feedback on coursework reports, oral presentations and project reports.	D4 is assessed by review of group project work.
D4-Work effectively within a team as a member.		D3 and D7 are specifically assessed by review of an individual's progress during individual major project work.
D5-Manipulate, sort and present data.	D2 is developed through their use in preparing project reports, laboratory reports, case studies, design work, etc.	
D6-Solve problems in a logical manner.		
D7-Learn effectively and independently, in all aspects of life.	D3 is developed through project work planning and throughout the programme.	
	D4 is developed through group project and assignment work.	
	D5 and D6 are developed through lectures and tutorial work throughout the programme.	
	D7 is developed and promoted throughout the programme.	
	Throughout, the learner is encouraged to develop transferable skills by maintaining a record of evidence and completing a personal	

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| development plan. | |

D. Programme Structures, Features, Levels, Modules, and Credits

The programme is offered in full-time (3 years), sandwich (4 years) or part-time (6 years) modes, and leads to the award of a BEng Degree with Honours in either Electrical and Electronic Engineering, Digital Communications and Electronics, or Digital Systems and Computer Engineering. Entry is normally at Level 4 (with A-Level, or equivalent qualifications) but is possible at level 5 with suitable qualifications (e.g. an Edexcel HND in Engineering with appropriate subjects studied). Direct entry into Level 6 is also possible, for example following successful completion of two years of a similar BEng or MEng degree programme at another HE institution. In this case, the final award will not be accredited.

Students may opt to study level 5 abroad as part of an exchange agreement with a partner university (see "Other information relevant to the programme" in section 2 page 14).

Students may also opt to study an additional Year Abroad at a partner institution normally in Europe or North America. To qualify for the Year Abroad option the studies taken at the host institution will normally be at least two semesters of full time study. Provided the student passes all assessments and a full transcript of their achievement in the host academic institution is submitted to the board of examiners, this will lead to an award of a BEng Degree with Honours in one of the named courses as listed in Section 1 (page 2) "with year abroad" on the final degree certificate.

Professional and Statutory Regulatory Bodies

The programme is accredited by the Institution of Engineering and Technology.

Work-Based Learning, including Sandwich Programmes

A designated sandwich programme leads to a University award in the sandwich mode and the word "sandwich" appears on the award certificate. In order for the BEng to lead to an award in the sandwich mode, the student must undertake a period of approved work experience (industrial placement) of not less than 48 weeks, excluding holidays, normally during year 3. To achieve this, students must start their work experience before 1st October. The work experience will normally be completed within the United Kingdom but with approval may be completed within other countries. Progress of the student's training is monitored by visits from University academic staff. Students will be required to document this period of work in accordance with the guidelines produced by the School. Students on industrial placement will be registered on the Placement Year Module (6AAD0015)

Students who have not achieved the minimum progression requirements at the end of level 5 may be prevented from undertaking a sandwich placement. The policy relating to progression onto the placement year from Level 5 is given in the School Guidelines on Industrial Placements. Additionally, students on industrial placement but who have level 4 or 5 modules to repeat, will not normally be allowed to re-enrol on these modules until they return from industrial placement. This is to avoid a conflict between UH attendance requirements and the student's commitment to their employer.

Students who do not take the sandwich option, progressing directly to level 6, are automatically transferred to the full-time mode and are required to complete a Careers Portfolio to demonstrate their employability skills (6ENT1021). This portfolio will include evidence of any employment experiences the student has, evidence of any voluntary work experience, an audit of their employability skills and a careers action plan to further their employability skills post graduation. It is expected that much of this evidence will have been gathered during the Career Skills Development module (4AAD0028) and Career Planning module (5AAD0032).

Programme Structure
The programme structure and progression information below (Table 1a and 1b) is provided for the Honours award. Any interim awards are identified in Table 1b. The Programme Learning Outcomes detailed above are developed and assessed through the constituent modules. Table 2 (in section 2)

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identifies where each learning outcome is assessed.

Mode of study:

The modes of study are Full Time: 3 years; Sandwich: 4 years and Part-time: 6 years

Entry point: Semester A

The following notations should be read in conjunction with table below:

Electrical and Electronic Engineering = EE
Digital Communications and Electronics = DCE
Digital Systems and Computer Engineering = DSCE

Level 4

c = compulsory module
o = optional module

Module Title	Module Code	Award			Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semester	Year of Study	
		EE	DCE	DSCE							Full Time Mode	Part Time Mode
Career Skills Development	4AAD0028	c	c	c	0	English	-	100	-	AB	1	1
Engineering Mathematics	4PAM1007	c	c	c	15	English	80	20	-	A	1	1
Introduction to Electronic Systems	4ENT1028	c	c	c	15	English	-	100	-	A	1	1
Sustainable Business of Electronics	4ENT1037	c	c	c	15	English	-	100	-	A	1	2
Digital Electronics & Computer Organisation	4ELE0050	c	c	c	15	English	80	20	-	A	1	2
Engineering Applications of Mathematics	4PAM1008	c	c	c	15	English	-	100	-	B	1	1
Electrical and Electronic Theory	4ENT1026	c	c	c	15	English	80	20	-	B	1	1
Electronic Engineering Practice	4ELE0041	c	c	c	15	English	-	100	-	B	1	2
Computer Programming for Electronics Engineers	4ELE0049	c	c	c	15	English	-	100	-	B	1	2

Progression to level 5 requires:

A minimum of 90 credits to remain on honours award.

Progression to non-honours level 5 with 75 credits may be permissible. The maximum study rate in such an instance would normally be 120 credits but students would be expected to remedy any failed modules from level 4 in the first instance.

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Level 5

c = compulsory module
o = optional module

Module Title	Module Code	Award			Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semester	Year of Study	
		EE	DCE	DSCE							Full Time Mode	Part Time Mode
Further Engineering Mathematics	5PAM1005	c	c	c	15	English	70	30	-	A	2	3
Digital Design & Embedded Systems	5ELE0060	c	c	c	15	English	70	30	-	A	2	3
Real-time Systems & Programming	5ELE0062	c	c	c	15	English	-	100	-	A	2	4
Electronic Communication Systems	5ELE0061	c	c	c	15	English	70	30	-	A	2	4
Project Management & Product Development	5ENT1024	c	c	c	15	English	70	30	-	B	2	3
Electrical Engineering & Power Control	5ELE0058	c	c	c	15	English	70	30	-	B	2	3
Data Acquisition & Control Systems	5ENT1021	c	c	c	15	English	-	100	-	B	2	4
Mini Projects (Electrical)	5ELE0066	c	-	-	15	English	-	100	-	B	2	4
Mini Projects (Communications)	5ELE0064	-	c	-	15	English	-	100	-	B	2	4
Mini Projects (Digital Systems)	5ELE0065	-	-	c	15	English	-	100	-	B	2	4
Career Planning	5AAD0032	c	c	c	0	English	-	100	-	AB	2	4

Progression to level 6 requires:

210 credit points and above to Honours award.

Progression to non-honours level 6 with 180 credits may be permissible. The maximum study rate in such an instance would normally be 120 credits but students would be expected to remedy any failed modules from level 5 in the first instance.

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Level 6

c = compulsory module, o = optional module - all students who do not take the Placement Year module must take the Careers Portfolio module in year 4 (year 5 if Part Time and not employed by an appropriate engineering company). EE4 students must choose either Telecommunication Systems or Micro-Engineering and Micro-Technology.

Module Title	Module Code	Award			Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semester	Year of Study	
		EE	DCE	DSCE							Full Time Mode	Part Time Mode
Placement Year	6AAD0015	o	o	o	0	English	-	100	-	ABC	3	-
Year Abroad	6ENT0001	o	o	o	0	English	-	-	-	AB	3	-
Careers Portfolio	6ENT1021	o	o	o	0	English	-	100	-	A	4	5
Microelectronics & VLSI	6ELE0068	c	c	c	15	English	60	40	-	A	4	5
Digital Signal Processing	6ELE0066	c	c	c	15	English	60	40	-	A	4	5
Power Systems	6ELE0071	c	-	-	15	English	60	40	-	A	4	6
Mobile & Digital Communication Networks	6ELE0069	-	c	c	15	English	60	40	-	A	4	6
Intelligent Systems and Robotics	6ELE0067	c	-	c	15	English	60	40	-	B	4	5
Advanced Power Conversion and Control	6ELE0062	c	-	-	15	English	60	40	-	B	4	6
Optical Communication Systems	6ELE0072	-	c	-	15	English	60	40	-	B	4	5
Satellite & Terrestrial Communication Systems	6ENT1014	-	c	-	15	English	-	100	-	B	4	6
Computer Architecture	6ELE0084			c	15	English	60	40	-	B	4	5
Operating Systems and Object Oriented Programming	6ELE0070	-	-	c	15	English	60	40	-	B	4	6
Telecommunication Systems	6ELE0074	o	c		15	English	60	40	-	B	4	5
Micro-Engineering & Micro-Technology	6ENT1022	o	-	-	15	English	-	100	-	B	4	5
Individual Major Project	6ENT1013	c	c	c	30	English	-	100	-	AB	4	6

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If any of the progression requirements stated above are not met then the Board of Examiners is empowered to require the student to transfer to the BEng (non-Honours). The study pattern for students transferring onto the BEng (non-Honours) route shall be agreed on a case-by-case basis with the BEng Programme Tutor or Associate Dean of School.

Honours classification
The University has approved structure and assessment regulations common to all programmes. Full details are provided in UPR AS14, Section D.

Table 1b Final and interim awards available
The programme provides the following final and interim awards:

Award	Minimum requirements	Available at end of Level
University Certificate	45 credit points at level 4	4
Certificate of Higher Education	120 credit points at level 4	4, 5
University Diploma	180 credit points including at least 60 at level 5	5, 6
Diploma of Higher Education	240 credit points including at least 120 at level 5	5, 6
BEng in the named award	300 credit points including 180 at level 6/5 of which 60 must be at level 6 excluding the individual major project.	6
BEng in the named award (Sandwich)	300 credit points including 180 at level 6/5 of which 60 must be at level 6 excluding the individual major project. Additionally, students must satisfactorily complete the Placement Year.	6
BEng in the named award with Year Abroad	300 credit points including 180 at level 6/5 of which 60 must be at level 6 excluding the individual major project. Additionally, students must satisfactorily complete the Year Abroad.	6
BEng (Hons) in the named award	360 credit points including 240 at level 6/5 of which 120 must be at level 6	6
BEng (Hons) in the named award (Sandwich)	360 credit points including 240 at level 6/5 of which 120 must be at level 6. Additionally, students must satisfactorily complete the Placement Year.	6
BEng (Hons) in the named award with Year Abroad	360 credit points including 240 at level 6/5 of which 120 must be at level 6. Additionally, students must satisfactorily complete the Year Abroad.	6

E. Support for students and their learning

Students are supported by;

- an induction week at the beginning of each new academic session;
- an extensive Learning Resources Centre, incorporating a library and computer centre;
- guided student-centred learning through the use of StudyNet;
- a student handbook that is specific to the programme;
- a Programme Tutor who can advice on programme issues;
- a Programme Administrator and admin assistants in the school office;
- Deputy Programme Tutors who provide personal tutoring support;
- Module teaching teams who provide academic support;
- Computer and technical laboratories facilities and technical support staff;
- a project supervisor;
- student representatives on the programme committee;

- the Mathematics Drop-in Centre;
- the Careers and Placement Service that support students looking for either graduate employment or a industrial placement.
- a visiting tutor for students on placement;
- a substantial Student Centre that provides advice on issues such as finance, University regulations, legal matters etc;
- the Medical Centre;
- the Accommodation Office;
- the International Students Centre who organise an Overseas Student Orientation induction programme;
- printing, photocopying, laminating and document binding facilities;
- Nightline – a confidential student listening and information service in the evening when other services are not available;
- a confidential counselling service;
- University Disability Advisors;
- an Equal Opportunities Officer;
- the Students' Union.

F. Entry requirements

The normal entry requirements for the programme are:

280 UCAS points plus GCSE Maths, English Language and Science grade C or above.

The UCAS points will typically come from:

- 3 A-levels including Maths plus Physics, technology or an engineering based subject. (General Studies/Critical Thinking are not accepted),

Applications are also welcomed from those holding other qualifications including equivalent BTEC National Diploma, Scottish Higher or Irish Higher Certificates, International Baccalaureate, and appropriate equivalent international qualifications.

English Language Requirements

Addition to the requirements stated above, students entering the programme and whose first language is not English will be required to demonstrate a proficiency in English to TOEFL 550/IELTS 6.0 or an equivalent recognised qualification.

Direct Entry at Second and Final Year

In accordance with University Admissions Policy to allow flexible entry at different levels, it may be possible for applicants to enter the programme at second and final year level. In all instances, candidates will be required to discuss their individual circumstances with the appropriate Admissions Tutor.

Students applying for direct entry into Level 5 are required to have an Edexcel HND in an appropriate discipline with merits and distinctions in appropriate subjects which must include Mathematics plus technical or physical sciences. Equivalent European and overseas qualifications are also accepted subject to University approval.

Direct entry into level 6 is also possible, for example following successful completion of two years of a similar BEng or MEng degree programme at another HE institution.

The programme is subject to the University's Principles, Policies, Regulations and Procedures for the Admission of Students to Undergraduate and Taught Postgraduate Programmes and will take account of University policy and guidelines for assessing accredited prior certified learning (APCL) and accredited prior experiential learning (APEL)

Section 2

Programme management

Relevant QAA subject benchmarking statements Engineering
Date of validation/last periodic review December 10
Date of production/ last revision of PS June 2013
Relevant intakes All students from September 2013
Administrative School School of Engineering and Technology

Table 3 Course structure

Course details						
Course code	**Course description**					**JACS**
EIEE	BEng Honours in Electrical and Electronic Engineering					H6

Course Instances						
Instances code	Intake	Stream		Instances Year	Location:	Mode of study
EE1S	A	Electrical and Electronic Engineering		1	Hatfield	Full-time/sandwich
EE2S	A	Electrical and Electronic Engineering		2	Hatfield	Full-time/sandwich
EEU2S	A	Electrical and Electronic Engineering		2	Hatfield	Full-time/sandwich
EE3F	A	Electrical and Electronic Engineering		3	Hatfield	Full-time
EEU3F	A	Electrical and Electronic Engineering		3	Hatfield	Full-time
EE3S	A	Electrical and Electronic Engineering		3	Hatfield	Sandwich
EEU3S	A	Electrical and Electronic Engineering		3	Hatfield	Sandwich
EE4S	A	Electrical and Electronic Engineering		4	Hatfield	Sandwich
EEU4S	A	Electrical and Electronic Engineering		4	Hatfield	Sandwich
EEP1P	A	Electrical and Electronic Engineering		1	Hatfield	Part-time
EEP2P	A	Electrical and Electronic Engineering		1	Hatfield	Part-time
EEP3P	A	Electrical and Electronic Engineering		2	Hatfield	Part-time
EEP4P	A	Electrical and Electronic Engineering		2	Hatfield	Part-time
EEP5P	A	Electrical and Electronic Engineering		3	Hatfield	Part-time
EEP6P	A	Electrical and Electronic Engineering		3	Hatfield	Part-time
DCE1S	A	Digital Communications and Electronics		1	Hatfield	Full-time/sandwich
DCE2S	A	Digital Communications and Electronics		2	Hatfield	Full-time/sandwich
DCEU2S	A	Digital Communications and Electronics		2	Hatfield	Full-time/sandwich
DCE3F	A	Digital Communications and Electronics		3	Hatfield	Full-time
DCEU3F	A	Digital Communications and Electronics		3	Hatfield	Full-time
DCE3S	A	Digital Communications and Electronics		3	Hatfield	Sandwich
DCEU3S	A	Digital Communications and Electronics		3	Hatfield	Sandwich
DCE4S	A	Digital Communications and Electronics		4	Hatfield	Sandwich

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DCEU4S	A	Digital Communications and Electronics	4	Hatfield	Sandwich
DCE1P	A	Digital Communications and Electronics	1	Hatfield	Part-time
DCE2P	A	Digital Communications and Electronics	1	Hatfield	Part-time
DCE3P	A	Digital Communications and Electronics	2	Hatfield	Part-time
DCE4P	A	Digital Communications and Electronics	2	Hatfield	Part-time
DCE5P	A	Digital Communications and Electronics	3	Hatfield	Part-time
DCE6P	A	Digital Communications and Electronics	3	Hatfield	Part-time
DSCE1S	A	Digital Systems and Computer Engineering	1	Hatfield	Full-time/sandwich
DSCE2S	A	Digital Systems and Computer Engineering	2	Hatfield	Full-time/sandwich
DSCEU2S	A	Digital Systems and Computer Engineering	2	Hatfield	Full-time/sandwich
DSCE3F	A	Digital Systems and Computer Engineering	3	Hatfield	Full-time
DSCEU3F	A	Digital Systems and Computer Engineering	3	Hatfield	Full-time
DSCE3S	A	Digital Systems and Computer Engineering	3	Hatfield	Sandwich
DSCEU3S	A	Digital Systems and Computer Engineering	3	Hatfield	Sandwich
DSCE4S	A	Digital Systems and Computer Engineering	4	Hatfield	Sandwich
DSCEU4S	A	Digital Systems and Computer Engineering	4	Hatfield	Sandwich
DSCE1P	A	Digital Systems and Computer Engineering	1	Hatfield	Part-time
DSCE2P	A	Digital Systems and Computer Engineering	1	Hatfield	Part-time
DSCE3P	A	Digital Systems and Computer Engineering	2	Hatfield	Part-time
DSCE4P	A	Digital Systems and Computer Engineering	2	Hatfield	Part-time
DSCE5P	A	Digital Systems and Computer Engineering	3	Hatfield	Part-time
DSCE6P	A	Digital Systems and Computer Engineering	3	Hatfield	Part-time

The programme is managed by;

- Dean of School;
- Associate Dean of School (AQA) who has overall responsibility for Quality Assurance;
- Associate Dean of School (L&T) who has overall responsibility for Learning & Teaching;
- the Programme Tutor who is responsible for chairing the programme committee and advising students on the programme as a whole;
- the Programme Administrator responsible for the administration associated with the programme;
- Deputy Programme Tutors who are responsible for the day to day management;
- an Admissions Tutor, with specific responsibility for selection;
- a programme committee that includes the above plus student representation and the Link tutor for combined studies (NB Combined studies study some of the modules);
- module leaders who are responsible for individual modules.

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Programme-specific assessment regulations

The programme is compliant with the University's generic assessment regulations (Structure and Assessment Regulations for Academic Programmes, UPR AS14) with the exception of those listed below, which have been specifically approved by the University:

- In order to satisfy the requirements of the accrediting bodies, the classification algorithm used from September 2014 will be based on the average of the best 120 credit points at level 6 (weighted by 75%) and the best 120 credit points at level 5 (weighted by 25%). This will apply to all students enrolling on level 4 from September 2012 and taking the full time route and any

students joining this cohort or subsequent cohorts due to taking the sandwich year, year abroad, repeating a year or joining these cohorts as a direct entry student at level 5. Direct entry students at level 6 from September 2014 onwards will have their degree classification based on the best 120 credits points at level 6 only.

- As specified by the accrediting body, a compensated pass cannot be awarded for the Individual Major Project, must be included in the calculation of degree classification and must be passed at the first attempt to gain an accredited award.

Course Code	Course Instance	Award Title	Modules	Must be included in Award degree algorithm
EIEE	EE3F, EE4S, EE6P	BEng (Hons) Electrical and Electronic Engineering	6ENT1013	*Yes*
EIEE	DCE3F, DCE4S, DCE6P	BEng (Hons) Digital Communications and Electronics	6ENT1013	*Yes*
EIEE	DSCE3F, DSCE4S, DSCE6P	BEng (Hons) Digital Systems and Computer Engineering	6ENT1013	*Yes*

Other sources of information

- Definitive Module Documents
- Module Guides
- Student Handbook
- A-Z guide
  http://www.studynet1.herts.ac.uk/ptl/common/support.nsf/support?ReadForm
- University of Hertfordshire Course website:
  http://www.herts.ac.uk/courses/
- QAA Benchmark Statement website:
  http://www.qaa.ac.uk/AssuringStandardsAndQuality/subject-guidance/Pages/Subject-benchmark-statements.aspx
- The Framework for Higher Education Qualifications in England, Wales and Northern Ireland, 2008:
  http://www.qaa.ac.uk/AssuringStandardsAndQuality/Qualifications/Pages/default.aspx
- SEEC Credit Level Descriptors for Further and Higher Education 2010:
  http://www.seec.org.uk/sites/seec.org.uk/files/SEEC%20Level%20Descriptors%202010.pdf
- External Quality Review report website:
  http://www.qaa.ac.uk/reviews/reports/instReports.asp?ukprn=10007147
  Professional or Statutory Regulatory Body information:
  http://www.theiet.org/
- UNISTATS website:
  http://www.unistats.com/
- University of Hertfordshire Academic Quality website:
  (StudyNet → Staff → Department Lists → Academic Quality Office)
- Structure & Assessment Regulations - Undergraduate & Taught Postgraduate Programmes, UPR AS14:
  http://sitem.herts.ac.uk/secreg/upr/AS14.htm
- Learning and Teaching Policy and Graduate Attributes, UPR TL03:
  http://sitem.herts.ac.uk/secreg/upr/TL03.htm
- Admissions - Undergraduate & Taught Postgraduate Students, UPR SA03:
  http://sitem.herts.ac.uk/secreg/upr/SA03.htm
- Academic Quality, UPR AS17:
  http://sitem.herts.ac.uk/secreg/upr/AS17.htm
  Index of UPRs for students:
  http://sitem.herts.ac.uk/secreg/upr_azlist_info.htm

Other information relevant to the programme

Full-time students may elect to undertake their level 5 studies at a partner institution abroad where an exchange agreement has been approved. To be eligible for the exchange option students must have passed 120 credits at level 4 with an average of at least 60%. If a student elects to do this, the eventual degree award remains unchanged. Whilst the programme of studies undertaken at the partner institution is not identical to that taken at UH, it is deemed to be equivalent. In order to maintain registration with UH, the entire level 5 of the programme taken at the partner institution has UH DMD number 5ENT1042 and a credit point rating of 120 in place of the 8 level 5 modules listed in Table 1A. The credits achieved from the partner institution will be recorded as passed and the final honours classification will be based entirely on level 6 achievement.

University policies relevant to the Programme

The University undertakes to use all reasonable endeavors to deliver, assess and administer this programme in accordance with this Programme Specification. At the same time it is recognised that it is in the nature of academic developments that changes, for example to the structure, curriculum, and assessment of a programme may be necessary in order to ensure that the programme remains up to date, in response to issues raised as a result of on-going monitoring and evaluation, and/or in order to conform to new regulatory requirements imposed by this institution, by professional or statutory bodies, or by national or governmental bodies.

The programme operates within the guidelines and policies relating to equal opportunities and environmental issues which may be agreed from time to time by the Board of Governors and/or the Academic Board of the University.

Where the programme is offered in collaboration with another institution these policies and guidelines will normally be those of the partner institution.

The programme operates in accordance with the University's Regulations Governing Studies Involving the Use of Human Subjects (UPR RE01) agreed from time to time by the Academic Board of the University. However, where the programme is offered in collaboration with another institution (for example through a franchise arrangement for all or part of the programme) then specific approval must be obtained from the University for the operation of the programme within ethical guidelines prepared by the partner institution. The partner institution will be responsible for all insurance liability in connection with the observance of ethical guidelines.

Signed ………………………………………………………....   Date…………………..

Choose an item.
Associate Dean of School (Academic Quality Assurance)

If you would like this information in an alternative format please contact: the School's Administration Manager.

University of Hertfordshire UH

Table 2: Development of Programme Learning Outcomes in the Constituent Modules

This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

BEng with Honours in Electrical and Electronic Engineering

Module Title	Module Code	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5	D6	D7
Engineering Mathematics	4PAM1007	X												X								X	X	
Engineering Applications of Mathematics	4PAM1008	X												X								X	X	
Introduction to Electronic Systems	4ENT1028	X	X				X	X					X											
Sustainable Business of Electronics	4ENT1037				X				X									X	X		X			
Digital Electronics & Comp. Org.	4ELE0050		X				X				X		X											
Comp. Prog. for Electronics Eng	4ELE0049		X					X			X	X												
Electronic Engineering Practice	4ELE0041			X						X	X			X	X				X		X			
Electrical & Electronic Theory	4ENT1026	X	X				X	X					X											
Career Skills Development	4AAD0028					X												X	X	X	X	X	X	X
Further Engineering Mathematics	5PAM1005	X																					X	
Digital Design & Embedded Systems	5ELE0060		X	X							X		X											
Electronic Communication Systems	5ELE0061	X	X										X		X									
Data Acquisition & Control Systems	5ENT1021		X	X			X	X				X	X		X									
Project Management & Product Dev.	5ENT1024	X		X		X	X				X			X			X	X				X		
Real-time Systems & Programming	5ELE0062		X				X				X		X		X									
Electrical Engineering & Power Control	5ELE0058		X				X					X	X		X									
Mini Projects (Electrical)	5ELE0066						X			X	X		X									X	X	X
Career Planning	5AAD0032					X												X			X			
Placement Year	6AAD0015				X	X										X	X	X	X				X	
Microelectronics & VLSI	6ELE0068					X					X		X											
Power Systems	6ELE0071					X	X	X			X	X	X	X		X								
Digital Signal Processing	6ELE0066					X	X					X	X			X								
Individual Major Project	6ENT1013						X			X	X				X		X	X	X	X		X	X	X
Intelligent Systems and Robotics	6ELE0067			X				X			X	X	X	X		X								
Advanced Power Conversion & control	6ELE0062										X		X			X								
Telecommunication Systems	6ELE0074					X	X					X	X			X								
Micro-Engineering & Micro-Technology	6ENT1022		X	X			X				X		X	X		X								
Careers Portfolio	6ENT1021					X												X		X	X			X

Programme Learning Outcomes (as identified in section 1 and the last page). Column groups: A1–A5 Knowledge & Understanding; B1–B5 Intellectual Skills; C1–C6 Practical Skills; D1–D7 Transferable Skills. Row groups: Level 4, Level 5, Level 6.

BEng with Honours in Digital Communications and Electronics

Module Title	Module Code	Knowledge & Understanding					Intellectual Skills					Practical Skills						Transferable Skills						
		A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5	D6	D7
Engineering Mathematics	4PAM1007	X												X								X	X	
Engineering Applications of Mathematics	4PAM1008	X												X								X	X	
Introduction to Electronic Systems	4ENT1028	X	X				X	X					X											
Sustainable Business of Electronics	4ENT1037				X				X									X	X		X			
Digital Electronics & Comp. Org.	4ELE0050		X				X				X		X											
Comp. Prog. for Electronics Eng	4ELE0049		X					X			X	X												
Electronic Engineering Practice	4ELE0041			X					X		X			X	X				X		X			
Electrical & Electronic Theory	4ENT1026	X	X				X	X					X											
Career Skills Development	4AAD0028					X												X	X	X	X	X	X	X
Further Engineering Mathematics	5PAM1005	X																					X	
Digital Design & Embedded Systems	5ELE0060		X	X							X			X										
Electronic Communication Systems	5ELE0061	X	X										X			X								
Data Acquisition & Control Systems	5ENT1021		X	X			X	X				X	X			X								
Project Management & Product Dev.	5ENT1024	X		X		X	X				X			X			X	X				X		
Real-time Systems & Programming	5ELE0062		X				X				X		X			X								
Electrical Engineering & Power Control	5ELE0058		X				X					X	X			X								
Mini Projects (Communications)	5ELE0064						X			X	X		X									X	X	X
Career Planning	5AAD0032					X												X				X		
Placement Year	6AAD0015				X	X										X	X	X	X				X	
Mobile & Digital Communication Networks	6ELE0069					X					X		X											
Microelectronics & VLSI	6ELE0068					X					X		X			X								
Digital Signal Processing	6ELE0066					X	X					X	X			X								
Individual Major Project	6ENT1013						X		X	X					X		X	X	X	X		X	X	X
Telecommunication Systems	6ELE0074					X	X					X	X			X								
Optical Communication Systems	6ELE0072										X		X			X								
Satellite & Terrestrial Communication Systems	6ENT1014					X					X		X			X								
Careers Portfolio	6ENT1021					X												X		X		X		X

BEng with Honours in Digital Systems and Computer Engineering

Table 2: Development of Programme Learning Outcomes in the Constituent Modules

This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

Module Title	Module Code	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5	D6	D7
Engineering Mathematics	4PAM1007	X												X								X	X	
Engineering Applications of Mathematics	4PAM1008	X												X								X	X	
Introduction to Electronic Systems	4ENT1028	X	X				X	X						X										
Sustainable Business of Electronics	4ENT1037				X				X									X	X		X			
Digital Electronics & Comp. Org.	4ELE0050		X				X				X			X										
Comp. Prog. for Electronics Eng	4ELE0049		X					X			X	X												
Electronic Engineering Practice	4ELE0041			X					X		X			X	X				X		X			
Electrical & Electronic Theory	4ENT1026	X	X				X	X						X										
Career Skills Development	4AAD0028					X												X	X	X	X	X	X	X
Further Engineering Mathematics	5PAM1005	X																					X	
Digital Design & Embedded Systems	5ELE0060		X	X							X			X										
Electronic Communication Systems	5ELE0061	X	X										X			X								
Data Acquisition & Control Systems	5ENT1021		X	X			X	X				X	X			X								
Project Management & Product Dev.	5ENT1024	X		X		X	X				X			X			X	X				X		
Real-time Systems & Programming	5ELE0062		X				X				X		X			X								
Electrical Engineering & Power Control	5ELE0058		X				X					X	X			X								
Mini Projects (Digital Systems)	5ELE0065						X			X	X		X									X	X	X
Career Planning	5AAD0032					X												X				X		
Placement Year	6AAD0015				X	X									X	X		X	X				X	
Microelectronics & VLSI	6ELE0068				X						X		X											
Digital Signal Processing	6ELE0066				X	X						X	X			X								
Mobile & Digital Communication Networks	6ELE0069				X						X		X											
Individual Major Project	6ENT1013						X		X	X					X		X	X	X	X		X	X	X
Intelligent Systems and Robotics	6ELE0067				X	X	X					X	X			X								
Computer Architecture	6ELE0084			X				X			X	X	X	X		X								
Operating Systems & Object Oriented Prog'	6ELE0070				X	X	X	X			X	X	X	X		X								
Careers Portfolio	6ENT1021					X												X		X		X		X

Levels: Level 4 (rows 4PAM1007–4AAD0028), Level 5 (rows 5PAM1005–6AAD0015), Level 6 (rows 6ELE0068–6ENT1021)

Programme Learning Outcomes (as identified in section 1 and the last page): A = Knowledge & Understanding, B = Intellectual Skills, C = Practical Skills, D = Transferable Skills

Key to Programme Learning Outcomes

Knowledge and Understanding

A1. The analytical methods employed by the student's chosen engineering discipline.
A2. The fundamental engineering sciences appropriate to the student's chosen engineering discipline.
A3. The design principles and design-to-build processes to the student's chosen engineering discipline.
A4. The basic principles and environmental/ethical considerations of the business of engineering.
A5. Professional engineering practice appropriate to the student's chosen engineering discipline.

Practical Skills

C1. Apply analytical and modelling techniques to solve problems appropriate to the student's chosen engineering discipline.
C2. Perform experimental work and draw conclusions.
C3. Use computer-based engineering tools.
C4. Prepare technical documentation.
C5. Evaluate the design of systems, components or processes appropriate to the student's chosen engineering discipline.
C6. Plan and manage a project, taking into account commercial and industrial constraints.

Intellectual Skills

B1. Analyse and solve engineering problems using appropriate techniques.
B2. Model and analyse relevant engineering systems.
B3. Select appropriate computer based methods for engineering and communication.
B4. Evaluate external influences on the design process.
B5. Design appropriate systems, components or processes.

Transferable Skills

D1. Communicate effectively, both orally and in writing.
D2. Use commonly available IT tools.
D3. Manage time and resources effectively.
D4. Work effectively within a team as a member.
D5. Manipulate, sort and present data.
D6. Solve problems in a logical manner.
D7. Learn effectively and independently, in all aspects of life.