ASTON UNIVERSITY PROGRAMME SPECIFICATION

Programme Title	Electronic Engineering and Computer Science
UCAS/JACS Code	GH46
School/Subject Area	Engineering and Applied Science - Electronic Engineering
Final Award	BEng Honours Degree ("BEng with professional placement" for sandwich students)
Interim Awards	Certificate of Higher Education , Diploma of Higher Education
Mode(s) of Study	3 year full-time (4 years for sandwich students)
Normal Length of Programme	3 years (4 years for sandwich students)
Total Credits	Honours Degree: 360 credits (full-time), 480 credits (sandwich) Ordinary Degree: 300 credits (full-time), 420 credits (sandwich)
Programme Accredited By	The Institution of Engineering and Technology (IET) The British Computer Society (BCS)
Dates Programme Specification Written and Revised	Revised August 2010; last revised September 2014

Education Aims of the Programme	This programme aims to meet the requirements of todays workplace by expanding the breadth and depth of our students knowledge in electronics, internet technology, computing, digital systems and software design. It also enables the development of essential professional skills. It provides a solid grounding in software engineering and computing systems which will be complemented by engineering expertise in digital electronics and telecommunications. This degree places emphasis on gaining a specialist and extremely valuable set of skills that form a bridge between the hardware and software; to achieve this students will study computing and electronics with single honours students from the electronic engineering and computer science subject groups. The MEng and BEng programmes share a common first two years. Students start by learning the basic principles of analogue, digital and programmable electronic systems and software design. They will also take courses in mathematics and entrepreneurship. The second year covers the areas of digital and programmable systems, communication systems and computer systems in more depth. A themed design project will enables the students to develop professional electronic design and management skills. Transfer to the MEng course is possible at this point subject to meeting the entry requirements. An optional placement year allows students to undertake a paid professional placement gaining valuable experience working as an engineer. This is tremendously helpful when they later look for graduate employment. In the final year the core modules cover digital systems design and software development. Students can take a broad range of options or specialise on one particular area such as communications, sensing or computer science. The course is structured so that most examined work is completed by January of the final year allowing you to spend the final semester concentrating on an extended individual project in an area of interest. • Accredited by the Institution of Engineering and Technology (IET) and the British Computer Society (BCS) • University funded student membership of the IET • Student run open-access electronics lab • Provides a grounding in the basic principles of modern electronic engineering and computer science • Opportunity to obtain relevant industrial or commercial experience by providing the option of a sandwich year.
Relevent Subject Benchmark Statements and other External and Internal Reference Points used to inform programme outcomes	• QAA General Engineering benchmarks • IET accreditation requirements • BCS accreditation requirements • Engineering Professors Council report on output standards • Engineering Council UK-SPEC requirements for CEng • UK Quality Code Part A.1 (2011)

Programme Structures and Requirements: Levels, Modules and Credits **Stage 1**						
Module Title	**Credits**	**Level**	**Module Code**	**Core/Option**	**Condonable**	**Prerequisites**
Java Programming Foundations (CS)	20	4	CS1310	Core		
Java Program Development	20	4	CS1410	Core		
Digital and Analogue Electronics	20	4	EE1DAE	Core	Y	Y
Electrical Circuit Theory	10	4	EE1ECT	Core		
Engineering Projects and Entrepreneurship 1	10	4	EE1EPE	Core		
Electrical Systems Engineering	20	4	EE1ESE	Core	Y	Y
Transition Mathematics for Engineers	10	4	SE11EM	Core		
Mathematics for First Year Engineers	10	4	SE12EM	Core		
TOTAL	120					

Programme Structures and Requirements: Levels, Modules and Credits **Stage 2**						
Module Title	**Credits**	**Level**	**Module Code**	**Core/Option**	**Condonable**	**Prerequisites**
Software Engineering	20	5	CS2020	Core		
Operating Systems	10	5	CS2230	Core		
Human-Computer Interaction	10	5	CS2260	Core		
Data Structures and Algorithms with Java	10	5	CS2310	Core		
Analogue Electronics	10	5	EE2AEL	Core		
Communication Systems	10	5	EE2CSY	Core		
Digital Programmable Systems	10	5	EE2DPS	Core		
Electronics Group Design Project	20	5	EE2EDP	Core		
The Professional Engineer	10	5	EE2PST	Core		
Sequential State Machines	10	5	EE2SSM	Core		
TOTAL	120					

Programme Structures and Requirements: Levels, Modules and Credits **Stage 3 P**						
Module Title	**Credits**	**Level**	**Module Code**	**Core/Option**	**Condonable**	**Prerequisites**
EAS Study Placement Year	120	P	SEP001	Core		
EAS Industrial Placement Year	120	P	SEP002	Core		
TOTAL	120					

Programme Structures and Requirements: Levels, Modules and Credits **Stage F**						
Module Title	**Credits**	**Level**	**Module Code**	**Core/Option**	**Condonable**	**Prerequisites**
Testing and Reliable Software Engineering	10	6	CS3270	Core		
Digital Systems Design	20	6	EE3DSD	Core		
Individual Final Year Project	50	6	EE3PRJ	Core	Y	N
Choose 40 credits from the following options						
Programming Language Concepts	10	5	CS2130	Option		
Computer Graphics	10	5	CS2150	Option		
Information Security	10	6	CS3190	Option		
Distributed Systems	10	6	CS3250	Option		
Software Project Management	10	6	CS3360	Option		
Interaction Design	10	6	CS3410	Option		
Data Mining	10	6	CS3440	Option		
Enterprise Computing Strategies	10	6	CS3460	Option		
Digital Systems Architecture	10	6	EE3DSA	Option		
Internetworking	10	6	EE3INW	Option		
Network Product Development	10	6	EE3NPD	Option		
Optical Sensing Systems	10	6	EE3OSS	Option		
Radio Systems and Personal Communications Networks	10	6	EE3RSY	Option		
Innovation Management	10	5	ME2033	Option		
TOTAL	120					

Programme Outcomes, Learning and Teaching and Assessment Strategies			
Knowledge and Understanding			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	Basic mathematics, science and technology underpinning the electronic engineering and computer science	On successful completion of their programme students, are expected to have knowledge and understanding of: • Basic Mathematics, Science and Technology underpinning the electronic engineering and computer science • Fundamental concepts and principles of electronic engineering • Analysis, design and implementation techniques applicable to electronic engineering, including the appropriate use of test and measurement equipment for circuit characterisation • Fundamental concepts and principles of computer science • Techniques for the analysis, design, implementation and testing of software and software systems using appropriate methodologies and including the supporting systems/hardware platform • The interplay between hardware and software in	Unseen written examinations, written coursework (in the form of experimental reports, essays, solved problems and dissertation), supervisor assessed project work, oral examinations, presentations, computer based testing.
2	Fundalmental concepts and principle of electronic engineering		
3	Anaylsis, design and implementation techniques applicable to electronic engineering including the appropiate use of test and measurement equipment for curcuit characterisation		
4	Fundalmental concepts and principles of computer science		
5	Techniques for the analysis, design, implementation and testing of software and software systems using appropriate methodologies and including the supporting systems/hardware platform		
6	The interplay between hardware and software in the design and construction of electronic and software systems		
7	Basic business and management techniques relevant to the engineering of electronic and software systems		

8	The role of the engineer in society including professional and ethical responsibilities and constraints affecting engineering judgement	the design and construction of electronic and software systems • Basic business and management techniques relevant to the engineering of electronic and software systems • The role of the engineer in society including professional and ethical responsibilities and constraints affecting engineering judgement Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated include a mixture of formal lectures, example classes, practical laboratory work, small group tutorials, self-study and group and individual project work.	

Intellectual Skills			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	Analyse and solve engineering problems with emphasis on those implying electronic and software systems in their solution	Analysis and problem solving skills are developed through formal lectures, example classes, small group tutorials, and self-study. Experimental and design skills are primarily obtained via practical classes and individual and group projects.	Unseen written examinations, written coursework (in the form of experimental reports, essays, solved problems and dissertation), supervisor assessed project work, oral examinations, presentations.
2	Evaluate, integrate and apply knowledge and methods from a variety of sources		
3	Plan, conduct, evaluate and report on a programme of work involving either or both electronic and software systems		
4	Design a solution to an engineering problem involving electronic and software systems, subject to various constraints; evaluate that design; and make improvements		

Professional Skills			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	Specify, design and implement systems involving either or both hardware and software elements using appropriate equipment and support environments	A mixture of formal lectures, console classes, self-study and group and individual project work.	Unseen written examinations, written coursework (in the form of experimental reports, solved problems and dissertation), presentations. Log book, report and presentation (Sandwich students only).
2	Plan and carry out testing and measurement of systems involving either or both hardware and software elements using appropriate equipment and support environments		
3	Prepare a technical report or presentation		
4	Demonstrate completion of Training consistent with UKSPEC		
5	Apply basic project management skills in an engineering environment		
6	Demonstrate completion of Industrial Training (Sandwich students only) includes an in-depth understanding of the relevance of the programme's discipline-specific and generic content to the world of work		

Transferable Skills			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	The ability to communicate and work effectively as an individual or a member of a team within an organisation	A mixture of formal lectures, example classes, console classes, practical laboratory work, small group tutorials, self-study and group and individual project work.	Unseen written examinations, written coursework (in the form of experimental reports, essays, solved problems and dissertation), supervisor assessed project work, oral examinations, presentations, computer based testing. Many of these skills are assessed indirectly via other learning outcomes.
2	The ability to communicate effectively both in writing and orally using appropriate tools		
3	Creative and problem solving skills		
4	The ability to model engineering systems appropriate to the disciplines of electronic engineering and computing.		
5	The ability to use appropriate ICT in a wide variety of situations		
6	The ability to manage time and resources		
7	Self-study and independent learning skills to facilitate professional development		

Entry Requirements	1 In addition to satisfying the general entry requirements (as stated in the General Regulations for Undergraduate Programmes), the applicant must have passed three GCE Advanced level subjects including: Mathematics and Electronics or a Physical Science or Computer Science, at grades prescribed by School Learning and Teaching Committee. Other subjects and other qualifications of equivalent standing, as approved by School Learning and Teaching Committee, may be acceptable alternatives. 2 Applications from mature students with appropriate experience will be considered on merit. 3 Students already reading another degree programme at AstonUniversity may be allowed to transfer to this programme, with the agreement of the Schools Associate Dean for Undergraduate Programmes.
Programme Regulations	**MODULE REQUIREMENTS** Electives should be chosen following discussion with the Programme Director. **ATTENDANCE** Students are normally required to attend the University for three stages and may undertake an approved placement for one stage over a period of four consecutive academic years, with the placement as the third stage. In order to qualify for the award of the degree a student must have attended the required proportion (normally 80%) of tutorials, seminars, practical classes and lectures. In the case of repeated unexcused absence over a period of two weeks or more, disciplinary proceedings may be instituted in the form of an official warning letter requiring attendance. If there is no response to this letter or satisfactory attendance is not resumed, the Schools Executive Dean may require the student to withdraw from the programme **INDUSTRIAL/PROFESSIONAL EXPERIENCE AND ASSESSMENT** In accordance with University Regulations, the student is required to produce a reflective account of the placement experience, such as a log-book; to submit satisfactory reports; and to give a presentation of the work carried out during the placement stage. Independent feedback from employer and tutors will also be used in the assessment. This work will be assessed as one module, worth 120 credits at level P. The placement is graded and does contribute to the classification of the degree awarded. **PROGRESSION REQUIREMENT** A pass in the module EE3PRJ (individual final year project) is required for the award of an Honours degree. An essential requirement in the formation of an engineer is the ability to perform practical work and to convey the results to others, for example by means of written reports. In consequence, students who have not submitted a significant proportion of the laboratory reports or other forms of continuous assessment contributing to stages one and two of the programme may not proceed until they have done so, at the discretion of the Board of Examiners. The significant proportion shall be normally at least 50% of the reports required for each assessment or exceptionally some other level decided by the Board of Examiners. This condition shall apply even when a student has otherwise satisfied the module requirements for progression. In order to gain exemption from the IET and the BCS examination requirements for progression towards Chartered Engineer status, the following condition must be satisfied: a pass in module EE3PRJ and at least an overall second class degree. **Exemption from Aston University General Regulations** Due to accreditation requirements by the Institute of Engineering Technology (IET), no more than 20 credits per 120 credits will be condoned at each stage of this programme.

General Regulations (http://www1.aston.ac.uk/registry/for-staff/regsandpolicies/general-regulations/) and the Regulations for the programme (above) take precedence over other information sources such as student handbooks if there is a conflict. If there is a conflict between General Regulations and Programme Regulations then General Regulations take precedence unless an exemption has been approved.

This specification provides a concise summary of the main features of the programme and the threshold learning outcomes that a student might normally be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. **The individual modules included in the programme may differ from those included in this programme specification as our programmes are subject to continuous review**. Information on admissions requirements and career opportunities is available in the relevant prospectus. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the appropriate module guides and programme handbook(s) which are available to students on enrolment.