**Programme Specification**

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| **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 he/she passes the programme. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the programme handbook. The accuracy of the information contained in this specification is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education. |

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| **BEng (Hons) Electronic and Computer Systems *(top-up degree)*** |

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| 1. **Awarding Institution/Body** | University of Kent |
| 1. **Teaching Institution** | University of Kent |
| 1. **School responsible for management of the programme** | Engineering and Digital Arts |
| 1. **Teaching Site** | Canterbury |
| 1. **Mode of Delivery** | Full-time  Part-time |
| 1. **Programme accredited by** | This top-up degree is not accredited by the Institute of Engineering and Technology (IET). |
| 1. **a) Final Award** | BEng (Hons) |
| 7. **b) Alternative Exit Awards** | n/a |
| 1. **Programme** | Electronic and Computer Systems |
| 1. **UCAS Code (or other code)** | H691 |
| 1. **Credits/ECTS Value** | 120 credits (60 ECTS) |
| 1. **Study Level** | Undergraduate |
| 1. **Relevant QAA subject benchmarking group(s)** | Engineering (2015) |
| 1. **Date of creation/revision** | May 2007 / Jan 2016 / revised FSO Jan 2018 |
| 1. **Intended Start Date of Delivery of this Programme** | September 2018 |

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| 1. **Educational Aims of the Programme**   The programme aims to: |
| 1. Enable students who have gained 240 credits on equivalent modules to those on our stage 1 and 2 Electronic and Communications Engineering (H619) programme, to obtain a top-up to a full BEng Honours degree. 2. Educate students to become engineers who are well equipped for professional careers in development, research and production in industry and universities, and who are well adapted to meet the challenges of a rapidly changing subject. 3. Produce professional engineers with specialist skills in hardware and software and a well-balanced knowledge of Electronic and Computer Systems. 4. Provide proper academic guidance and welfare support for all students. 5. Create an atmosphere of co-operation and partnership between staff and students, and offer the students an environment where they can develop their potential. |

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| **16 Programme Outcomes**  The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas.  The programme outcomes have references to the subject benchmarking statement for Engineering (2015). |

**A. Knowledge and Understanding of:**

1. Mathematical principles relevant to electronic and communications engineering (B2).
2. Scientific principles and methodology relevant to electronic and communications engineering (B1).
3. Advanced concepts of analogue and digital circuits and systems, telecommunications and instrumentation.
4. The value of intellectual property and contractual issues (B23).
5. Business and management and project management techniques which may be used to achieve engineering objectives (B15).
6. The need for a high level of professional and ethical conduct in electronic engineering (B18).
7. Current manufacturing practice with particular emphasis on product safety, environmental and EMC standards and directives (B8).
8. Characteristics of materials, equipment, processes and products (B19).
9. Appropriate codes of practice, industry standards and quality issues (B24, B25).
10. Contexts in which engineering knowledge can be applied (B21).

**Skills and Other Attributes**

**B. Intellectual Skills:**

1. Analysis and solution of problems in electronic engineering using appropriate mathematical methods.
2. Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of electronic engineering (B3).
3. Use of engineering principles and the ability to apply them to analyse key electronic engineering processes (B4).
4. Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques (B5).
5. Ability to apply and understand a systems approach to electronic engineering problems (B7).
6. Ability to investigate and define a problem and identify constraints including cost drivers, economic, environmental, health and safety and risk assessment issues (B8, B10).
7. Ability to use creativity to establish innovative, aesthetic solutions whilst understanding customer and user needs, ensuring fitness for purpose of all aspects of the problem including production, operation, maintenance and disposal (B9, B11, B12).
8. Ability to demonstrate the economic and environmental context of the engineering solution (B14, B16, B17).

**C. Subject-specific Skills:**

1. Use of mathematical techniques to analyse problems in electronic engineering.
2. Ability to work in an engineering laboratory environment and to use a wide range of electronic equipment, workshop equipment and CAD tools for the practical realisation of electronic circuits (B20).
3. Ability to work with technical uncertainty or incomplete knowledge (B26).
4. Ability to apply quantitative methods and computer software relevant to electronic engineering in order to solve engineering problems (B6).
5. Ability to design electronic circuits or systems to fulfil a product specification and devise tests to appraise performance.
6. Awareness of the nature of intellectual property and contractual issues and an understanding of appropriate codes of practice and industry standards (B23, B24).
7. Ability to use technical literature and other information sources and apply it to a design (B22).
8. Ability to apply management techniques to the planning, resource allocation and execution of a design project and evaluate outcomes (B13).
9. Ability to prepare technical reports and presentations to technical and non-technical audiences.

**D. Transferable Skills:**

1. Ability to generate, analyse, present and interpret data.
2. Use of Information and Communications Technology.
3. Personal and interpersonal skills, work as a member of a team.
4. Communicate effectively (in writing, verbally and through drawings).
5. Learn effectively for the purpose of continuing professional development.
6. Ability for critical thinking, reasoning and reflection.
7. Ability to manage time and resources within an individual project and a group project.

**Teaching/learning and assessment methods and strategies used to enable the programme learning outcomes to be achieved and demonstrated**

**Teaching/learning**

Lectures; tutorial lectures; demonstrator-led examples classes; tutor led small group supervisions; self-directed learning through project work; laboratory experiments and computer-based assignments. In particular, the project gives hands-on experience of electronic and computer design and project management.

**Assessment**

Written unseen examinations; assessed coursework in the form of examples class assignments, assessed project work, reports and presentations, assignments and class tests.

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| For more information on the skills developed by individual modules and on the specific learning outcomes associated with any Certificate, Diploma or BA/BSc non-honours awards relating to this programme of study, see the module mapping table, located at the end of this specification. |

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| **17 Programme Structures and Requirements, Levels, Modules, Credits and Awards**  This programme is designed as a top-up degree to suitably qualified candidates who have already obtained 240 credits on equivalent modules to those on our stage 1 and 2 Electronic and Communications Engineering (H619) programme. The programme is studied over one year full-time or two years part-time.  The programme is divided into modules with a total of 120 credits. Students must successfully complete each module in order to be awarded the specified number of credits for that module. One credit corresponds to approximately ten hours of 'learning time' (including all classes and all private study and research). Thus obtaining 120 credits in an academic year requires 1,200 hours of overall learning time. For further information on modules and credits refer to the Credit Framework at <http://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html>  Each module and programme is designed to be at a specific level. For the descriptors of each of these levels, refer to Annex 2 of the Credit Framework at <http://www.kent.ac.uk/teaching/qa/credit-framework/creditinfoannex2.html>.  Compulsory modules are core to the programme and must be taken by all students studying the programme. Optional modules provide a choice of subject areas, from which students will select a stated number of modules. The normal expectation is that the termly module load will be equally balanced across the terms.  Where a student fails a module(s) due to illness or other mitigating circumstances, such failure may be condoned, subject to the requirements of the Credit Framework and provided that the student has achieved the **programme** learning outcomes. For further information refer to the Credit Framework at <http://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html>.  Where a student fails a module(s), but has marks for such modules within 10 percentage points of the pass mark, the Board of Examiners may nevertheless award the credits for the module(s), subject to the requirements of the Credit Framework and provided that the student has achieved the **programme** learning outcomes. For further information refer to the Credit Framework.  Failure in certain modules may not be compensated, as indicated by the symbol \* below. |

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| **KV Code** | **Code** | **Title** | **Level** | **Credits** | **Term(s)** |
| **Stage 3** | | | | | |
| **Compulsory Modules** | | | | | |
| EENG6000 | EL600\* | Project | 6 | 45 | 1 & 2 |
| EENG6650 | EL665 | Communication Systems | 6 | 15 | 1 & 2 |
| EENG6670 | EL667 | Embedded Computer Systems | 6 | 15 | 1 & 2 |
| EENG6710 | EL671 | Product Development | 6 | 15 | 1 & 2 |
| EENG6760 | EL676 | Digital Signal Processing and Control | 6 | 15 | 1 & 2 |
| EENG6770 | EL677 | Digital Communication Systems | 6 | 15 | 1 & 2 |

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| **18 Work-Based Learning** |
| Disability Statement: Where disabled students are due to undertake a work placement as part of this programme of study, a representative of the University will meet with the work placement provider in advance to ensure the provision of anticipatory and reasonable adjustments in line with legal requirements. |

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| **19 Support for Students and their Learning** |
| * School and University induction programme * Programme/module handbooks * Library services <http://www.kent.ac.uk/library/> * Student Support <http://www.kent.ac.uk/studentsupport/> * Student Wellbeing [www.kent.ac.uk/studentwellbeing/](http://www.kent.ac.uk/studentwellbeing/) * Centre for English and World Languages <http://www.kent.ac.uk/cewl/index.html> * Student Learning Advisory Service <http://www.kent.ac.uk/uelt/about/slas.html> * PASS system <https://www.kent.ac.uk/teaching/qa/codes/taught/annexg.html> * Academic Adviser system <https://www.kent.ac.uk/teaching/advisers/index.html> * Kent Union [www.kentunion.co.uk/](http://www.kentunion.co.uk/) * Careers and Employability Services [www.kent.ac.uk/ces/](http://www.kent.ac.uk/ces/) * Counselling Service <https://www.kent.ac.uk/studentwellbeing/counselling/> * Information Services (computing and library services) [www.kent.ac.uk/is/](http://www.kent.ac.uk/is/) * Undergraduate student representation at School, Faculty and Institutional levels * International Recruitment Office <https://www.kent.ac.uk/internationalstudent/>; International Partnerships Office <https://www.kent.ac.uk/global/partnerships/> * Medical Centre <https://www.kent.ac.uk/studentwellbeing/medicalcentre.html>   School-specific support available:   * Moodle VLE pages with full module information, assignments, lecture notes, coursework submission etc. * SEDA web pages with comprehensive information regarding all aspects of studies at Kent. Also various newsgroups * Health and Safety booklet provided at the start of each academic year * Computing and multimedia facilities, lecture and seminar rooms and experimental laboratories all within the Jennison building and on the campus. Many of these rooms contain audio-visual equipment and computer projectors. * Welfare guidance: The School has a Student Support Officer providing guidance and support on welfare issues. |

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| **20 Entry Profile**  The minimum age to study a degree programme at the university is normally at least 17 years old by 20 September in the year the programme begins. There is no upper age limit. |
| 20.1 **Entry Route**  For current information, please refer to the University prospectus |
| This programme is an intensive one year top-up programme for applicants who have completed one of the following:   * HNC/HND in an appropriate subject (such as Electrical/Electronic Engineering). * Foundation degree in an appropriate subject (such as Electrical/Electronic Engineering). * Successfully completed two years of an appropriate honours degree programme.   The applicants need to be individually considered by the Admissions Officer as the suitability of the programme will depend on the syllabus of HNC/HND/FD/Honours Degree and the grades obtained in individual modules. |
| 20.2 **What does this programme have to offer?** |
| * An excellent grounding in the underlying principles of electronic systems design. * The opportunity to study subjects related to electronic and computer systems, such as electronic circuit and system design, embedded systems design and control engineering. * The development of a broad range of skills that are highly sought after by employers and which open up a wide range of careers to graduates within the electronics, computing and aerospace industries. |
| 20.3 **Personal Profile** |
| * An interest in electronics, computers and communications. * A desire to become an engineer working in the electronics, computing or aerospace industry. * A willingness to work with computers and use computer aided design (CAD) tools. * A commitment to develop the skills that are required to build electronic and control systems. |

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| 21 **Methods for Evaluating and Enhancing the Quality and Standards of Teaching and Learning** |
| 21.1 **Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards** |
| * Student module evaluations * Annual programme and module monitoring reports <http://www.kent.ac.uk/teaching/qa/codes/taught/annexe.html> * External Examiners system <http://www.kent.ac.uk/teaching/qa/codes/taught/annexk.html> * Periodic programme review <http://www.kent.ac.uk/teaching/qa/codes/taught/annexf.html> * Annual staff appraisal * Peer observation * Quality Assurance Framework <http://www.kent.ac.uk/teaching/qa/codes/index.html> * QAA Higher Education Review <http://www.qaa.ac.uk/InstitutionReports/types-of-review/higher-education-review/Pages/default.aspx> |
| 21.2 **Committees with responsibility for monitoring and evaluating quality and standards** |
| * Staff-Student Liaison Committee * School Education Committee * Faculty Education Committee * Faculty Board * Education Board * Board of Examiners |
| 21.3 **Mechanisms for gaining student feedback on the quality of teaching and their learning experience** |
| * Student module evaluations * Staff-Student Liaison Committee * Student rep system (School, Faculty and Institutional level) * Annual NSS |
| 21.4 **Staff Development priorities include:** |
| * PGCHE requirements * HEA (associate) fellowship membership * Annual appraisals * Institutional Level Staff Development Programme * Academic Practice Provision (PGCHE, other development opportunities) * Professional body membership and requirements * Programme team meetings * Research seminars * Conferences * Study leave * Equality, Diversity and Inclusivity (EDI) awareness |

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| 22 **Indicators of Quality and Standards** |
| * Results of periodic programme review (2014) * QAA Higher Education Review 2015 * Annual External Examiner reports * Annual programme and module monitoring reports |
| 22.1 **The following reference points were used in creating these specifications:** |
| * QAA UK Quality Code for Higher Education <http://www.qaa.ac.uk/assuring-standards-and-quality> * QAA Benchmarking statement for Engineering (2015). * School and Faculty plan * University Plan <https://www.kent.ac.uk/about/plan/> and Learning and Teaching Strategies <https://www.kent.ac.uk/uelt/strategies/lta.html> * Staff research activities * Kent Inclusive Practices (<https://www.kent.ac.uk/studentsupport/accessibility/inclusive-practice.html>) |

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| 23 **Inclusive Programme Design** |
| The School recognises and has embedded the expectations of current equality legislation, by ensuring that the programme is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services. |

*Template last updated November 2017*

### **Curriculum Map for B.Eng. (Hons) Electronic and Computer Systems**

*Explanation*. This map provides a design aid to help academic staff identify where the programme outcomes are being developed and assessed within the course. The map shows only the main measurable learning outcomes. There are many more outcomes in the module specifications. D5-D7 pervade all modules.

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| Modules | | Programme Outcomes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | Codes | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | 10 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | D1 | D2 | D3 | D4 | D5-D7 | |
| STAGE 3 | Project | EL600 |  |  |  | x | x | x | x | x | x | x |  | x | x | x | x | x | x | x |  | x | x | x | x | x | x | x | x | x | x | x | x | x | |
| Digital Communications Systems | EL677 | x | x | x |  | x |  |  |  |  |  | x |  | x | x | x |  |  |  | x |  | x | x | x |  |  |  | x | x | x |  | x | x | |
| Communications Systems | EL665 |  | x | x |  |  |  |  | x |  |  | x |  | x |  | x |  |  |  | x |  |  |  | x |  |  |  |  |  |  |  |  | x | |
| Product Development | EL671 |  |  |  |  | x | x | x | x | x | x | x | x | x |  |  | x | x | x | x |  | x |  |  | x | x |  |  |  |  |  | x | x | |
| Embedded Computer Systems | EL667 |  |  | x |  |  |  |  | x |  |  |  | x | x |  | x |  | x |  |  | x | x | x | x |  | x |  |  | x |  |  |  | x | |
| DSP& Control | EL676 | x | x | x |  |  |  |  |  |  |  | x |  | x | x | x |  |  |  | x | x |  | x | x |  |  |  |  | x |  |  |  | x | |