Birmingham City University
Faculty of Technology, Engineering and the Environment

Undergraduate Programme

Programme Specification

BEng (Hons) Electronic Engineering

Date of Course Approval/Review	Version Number	Version Date
10 May 2011	1.01	June 2011

Definitive Documents and Version Control

This document has a version number and reference date in the footer.

The process leading to the introduction of new courses, major changes to courses, and minor changes to courses and modules follows the appropriate formal procedure as described in the Faculty's Academic Procedures and Quality Manual.

On the front sheet of this document, the date of course approval/review refers to the most recent full approval/review event. If later, the version date will be that of the most recent subsequent event at which formal consideration was given to course changes.

Further details about the course and document development may be obtained from minutes of the approval or minor changes board. A history of the document since the last full approval/review event is summarised in the table below and further information relating to past versions can be obtained from the Faculty Office.

Version	Event	Date of event	Authorised by
1.00	Review & Re-Approval	May 2011	Dean of Faculty
1.01	Review & Re-Approval – meeting panel conditions		Panel Chair

Programme Specification
BEng (Hons) Electronic Engineering

NOTE: This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes advantage of the learning opportunities that are provided. More detail on the specific learning outcomes, indicative content and the teaching, learning and assessment methods of each module can be found in the Module Specifications and the Student Handbook..

The accuracy of the information contained in this document is reviewed by the University and may be checked within independent review processes undertaken by the Quality Assurance Agency.

Awarding Institution / Body:	Birmingham City University
Teaching Institution:	Technology Engineering and the Environment
Interim Awards and Final Award:	Cert HE / Dip HE / BEng / BEng (Hons)
Programme Title:	BEng(Hons) Electronic Engineering
Main fields of Study:	Analogue and digital electronics, embedded systems and digital signal processing.
Modes of Study:	Electronic Engineering is delivered as a full time or part time programme of study. Supporting materials are available via a virtual learning environment and individual module websites.
Language of Study:	English
UCAS Code:	H610
JACS Code:	H610

Professional Status of the programme

The programme is accredited by the Institution of Engineering and Technology (IET) as satisfying academic requirements for the partial fulfilment of Chartered Engineer (CEng) status.

Relevant subject benchmark statements and other external reference points used to inform programme outcomes:

QAA Benchmarking Group: Engineering

Engineering Council UKSpec general and specific outcomes for programmes leading to CEng, as specified by the IET. QAA Benchmarking Group: Engineering

Programme philosophy and aims

The faculty has offered courses in Electronic Engineering for many years and offers a vibrant learning environment for a study programme that places emphasis on innovation and practical applications relevant to career needs.

The BEng Electronic Engineering course is designed primarily for school/college leavers but has also been popular with industry sponsored students in the part-time day-release mode – HNC holders enter at level 5 (equivalent to full-time year 2) and can complete the day-release programme in three years. Regular updates to course content ensure currency with developments in industry.

Students have the opportunity to engage with a variety of projects and collaborative ventures, including:

- the Micromouse competition for Autonomous Guided Vehicles, an annual international event for the design and build of small intelligent robots capable of navigating through a maze. Students are welcome to enter. The event has been hosted by the faculty since 2004. The Micromouse club meets monthly.

- A Special Interest Group (SIG) in Intelligent Games Technology – that uses a variety of programmable electronics and digital signal processing skills which are applicable in this exciting and rapidly developing area.

- A range of automotive and environmental engineering industrial consultancies and research programmes; that involve electronic measurement, control and process systems.

The faculty has close links with major employers in the region to enhance the students learning experience through case studies, projects and industrial placements. Government sponsored knowledge transfer schemes have funded faculty research posts, leading to opportunities for industry-based undergraduate projects and placements.

Career prospects are expected to keep pace with continuing rapid advances in electronics leading to increased demand for competent, versatile graduates who can design and implement innovative applications for industry. The course aims to enable students to meet this demand.

The aims of the programme are to provide :

- a stimulating and rewarding learning experience which develops knowledge and applications skills in analogue and digital electronics, embedded systems, communications systems, digital signal processing and management relevant to careers involving electronics;

- an understanding of commercial, legal, ethical and environmental factors associated with electronic engineering;

- encouragement to develop transferable and key skills applicable to

employment and continuing professional development;

- a foundation for further study and research;
- a qualification that satisfies accreditation requirements of relevant professional bodies.

Intended learning outcomes and the means by which they are achieved and demonstrated:

Learning Outcomes

1. Knowledge and Understanding

On completion of the programme the student should be able to**:**

KU1. apply mathematical methods for analysis, modelling and simulation of applied electronic engineering systems;

KU2. understand fundamental concepts, principles, theories and technologies that underpin electronic engineering;

KU3. use techniques for analysis, modelling, design, implementation and testing of analogue electronics, digital electronics, embedded and digital signal processing systems;

KU4. apply organisational, teamwork and management approaches required by professional engineers;

KU5. use commercial, ethical, regulatory and environmental factors that influence engineering solutions.

2. Intellectual Skills

On completion of the programme the student should be able to**:**

IS1. analyse and evaluate information from a variety of sources and in various formats used in electronic engineering;

IS2. specify requirements and devise and implement designs and solutions for electronic engineering systems demonstrating creativity and innovation;

IS3. apply professional judgment to engineering decisions taking account of relevant commercial, legal and regulatory factors;

IS4. argue rationally and draw independent conclusions based on a rigorous, analytical and critical assessment of argument, opinion and data;

IS5. evaluate electronic engineering techniques and products and make reasoned choices and recommendations.

3. Practical Skills

On completion of the programme the student should be able to**:**

PS1. use laboratory and workshop equipment safely and record data competently;

PS2. apply tools and techniques for the design, implementation, testing and maintenance of electronic engineering systems;

PS3. use computer based systems and software for designing and modelling electronic systems;

PS4. apply methodologies for research using primary, secondary, print and electronic sources and compile findings;

PS5. manage an electronic engineering project.

4. Transferable/Key Skills

On completion of the programme the student should be able to**:**

TS1. monitor, record, present, analyse and interpret data;

TS2. communicate effectively using written, oral and ICT-based media;

TS3. manage time, prioritise activities;

TS4. access and make appropriate use of numerical and statistical information;

TS5. make effective use of information and communication technologies, including word and data processing packages, the internet, email and electronic information systems;

TS6. Reflect on own learning, being constructively self-critical and demonstrate self-reliance to progress and plan for personal and carrer development.

TS7. work with, and relate effectively to others in the organization and management electronic and other group projects.

Learning teaching, and assessment methods used

Knowledge and understanding are acquired through a variety of methods, including formal lectures, tutorials and other directed independent learning activities and reinforced by laboratory tasks and seminars. Learning resources are made available on staff and module intranet pages to permit flexibility in engagement with the materials.

Analytical skills are developed through coursework tasks that encourage creativity and problem solving using a range of systems and technologies relevant to the electronic industry. Practical applications are a key feature of the course and are emphasised in course design and delivery. Small-group tutorial and practical work comprise up to two thirds of timetabled sessions.

Learners are assessed both formatively and summatively by a number of methods. Formative assessment occurs in various ways throughout the programme and involves feedback from peers, tutors and individual reflection.

A range of assessment methods are employed, the criteria for each module being published within each specified module guide and assignment briefs.
Knowledge is assessed, formatively and summatively, by a number of methods, including seminars, coursework exercises, examinations (seen and unseen, open- and closed- book), presentations, and practical assignments.

Intellectual skills , particularly analytical and problem solving skills, are developed using a range of case-studies and problem / task based learning scenarios. Assessment of such activities includes practical simulation and design exercises and individual and group projects, in addition to the methods mentioned above.

The acquisition of appropriate **practical skills** is central to the learning strategy of the programme. All technical themes provide weekly timetabled practical laboratory or PC based sessions, supported by lecturing or other technically qualified staff. The content of these sessions evolves as the student progresses through the course from guided tasks to develop basic practical skills in the use of measurement and test equipment and software tools, through exercises to reinforce the understanding of fundamental principles and techniques, to open-ended mini-projects to give experience of practical modelling, simulation and design of complex systems. Assessment methods include laboratory and design reports, presentations and in-class demonstrations of working hardware and software or simulated designs.

Learners develop **research skills** in module activities and assessments and by undertaking a major individual project and completing a related dissertation.

Transferable/key skills are core to the learning and assessment strategy of the programme. They are pervasive, and are incorporated into modules and assessments as appropriate, e.g. team-working skills are fostered and assessed via group, task-based practical projects.

Learners are encouraged to plan their own work schedules and are required to meet deadlines. Reflection and self awareness are fostered by keeping logbooks of laboratory and design activity and attending tutor interviews in support of personal performance

Programme structure

The structure of the course is shown in the diagram below.

The BEng programme is normally studied over three years full-time or five years part-time. Students may transfer between full and part-time modes of attendance.

The course is divided into taught modules of 15 and 30 credits and a final year project.

Students are made an award based on the credits achieved when they complete or exit the programme. Students complete 120 credits at level 4 (full-time year 1) for Certificate of Higher Education in Electronic Engineering, 120 credits at level 5 (full-time year 2) for Diploma of Higher Education in Electronic Engineering, 60 credits at level 6 (full-time year 3) for Bachelor of Electronic Electronic and 120 credits at level 6 (full-time year 3) for Bachelor of Science with Honours in Electronic Engineering.

Each credit represents 10 notional hours of student learning and assessment.

Level 6				
Individual Project **45 Credits**	**Sensors and Instrumentation** **15 Credits**	**Embedded Systems and Control** **30 Credits**	**Microelectronics** **15 Credits**	**Digital Signal Processing** **15 Credits**
Level 5				
Management in Engineering Innovation **15 Credits**	**Analogue Circuits & Systems** **30 Credits**	**Embedded Systems** **30 Credits**	**Digital Systems** **30 Credits**	**Signal and Systems** **15 Credits**
Level 4				
Measurement and Analysis **15 Credits**	**Electrical Principles** **15 Credits**	**ElectronicSystems** **30 Credits**	**Computer Programming** **30 Credits**	**Mathematical Analysis** **30 Credits**

Support for Learning including Personal Development Planning (PDP)

Students are encouraged to identify and, with guidance, to reflect on their own learning needs and are offered the following support as appropriate to meet those needs:

- an induction programme dealing with orientation and the dissemination of essential information, including an introduction to PDP;
- A dedicated Learning Centre with open access learning materials, resources and full-time staff specialising in a variety of support areas.
- A Student Handbook, containing information relating to the University, Faculty, course and modules.
- Access to administrative staff and to academic staff, including the Tutors, Module Coordinators, Course Director and Associate Head of School, at reasonable times;
- Support staff to advise on pastoral and academic issues, and to offer support and assistance with the keeping of Students' Progress Files;
- Access to Faculty resources, including a range of IT equipment and the services of, and guidance from, IT support staff;
- Access to the University's Student Services, including those offered by the careers service, financial advisers, medical centre, disability service, crèche, counselling service and chaplaincy;
- resources for Professional Development Planning (PDP) to enable reflection on learning, performance and achievement and to plan personal, educational and career development. The university offers a range of on-line courses (www.moodle.bcu.ac.uk) to support PDP topics including: Reflection, Career & Employability, Action Planning, Self Awareness and Self Employment.

Criteria for admission

Candidates must satisfy the general admission requirements of the programme.

The current admission requirements can be found under the 'Entry Requirements' tab of the web page for this course.

Methods for evaluation and enhancement of quality and standards including listening and responding to views of students

The following faculty committees are involved in evaluation and enhancement of quality, standards and student experience: Board of Studies, Faculty Board, Learning and Teaching Committee, Academic Standards and Quality Enhancement Committee.

Review and evaluation processes in which students are involved include annual course and module reviews, course review and re-approval events, professional body accreditation visits and external examiner visits. Mechanisms for student input include meetings with course tutors, feedback questionnaires, faculty and university student satisfaction surveys and representation on the faculty committees referred to above.

External examiners are members of examination boards and their remit includes meeting students and monitoring and reporting on academic standards.