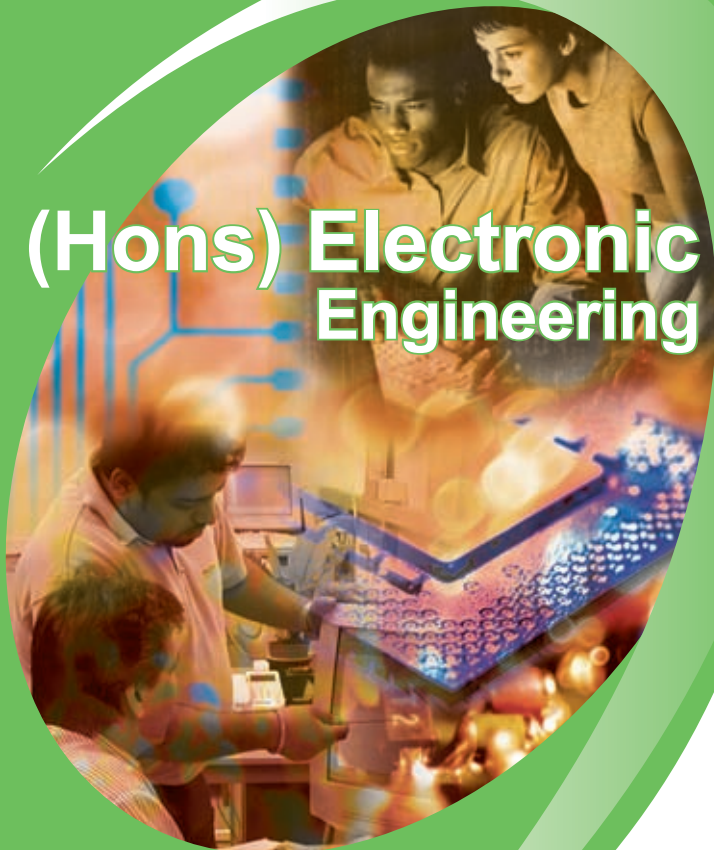


Birmingham City University
Technology Innovation Centre

BEng (Hons) Electronic Engineering



BIRMINGHAM
City University

Formerly UCE Birmingham



technology innovation centre

BEng (Hons) Electronic Engineering

Introduction

The rapid technological change that influences nearly every aspect of our lives is built on the all-pervasive application of electronics, communications and computer technologies. There is huge potential for graduates who combine the ability to analyse, design, implement and test such electronic systems, with an understanding of the convergence of these technologies in modern integrated systems, in fields as diverse as audio production, robotics and mobile communications.

The BEng (Hons) Electronic Engineering Degree combines a study of the enabling technologies of electronics and communications with applications relating to design and development of real systems. Graduates will be versatile, adaptable, technically literate, creative and acquire practical design skills relevant to the specification, design, simulation and test of electronic and microelectronic systems.

Course Aims

To provide graduates with the following skills and knowledge:

- The principal features and operations of electronic and microelectronic components and systems
- Fundamental concepts, principles and theories that underpin analogue electronics, digital electronics, communication (both radio and network) and embedded systems
- Relevant analytical and mathematical modelling techniques used to solve problems in electronic circuit design
- General tools and techniques for the specification, design and verification of software for embedded systems
- Practical skills necessary for the specification, design implementation and testing of electronic and microelectronic systems
- Digital signal processing techniques applied to electronics and communication systems
- Commercial, social and business factors that influence the choice of solution to engineering problems
- The organisational, teamwork and practical management approaches required by professional engineers

Career Prospects

There are many exciting graduate employment opportunities available including:

- Integrated circuit design and test engineers
- Robotics and intelligent systems designers and integrators
- Automatic identification and data capture systems designers and integrators
- Software developers for embedded processing applications
- Industrial process automation engineers
- Audio and sound recording equipment designers and systems integrators
- Automotive electronic systems engineers
- Virtually any industry that uses electronic systems in its products or processes

Technology Innovation Centre

Courses at Birmingham City University's Technology Innovation Centre are designed with industry to produce highly employable graduates across a wide spectrum of Advanced Engineering, Design, Interactive Media and Information and Communications technologies.

You will benefit from both the outstanding resources and facilities at our Millennium Point campus and our unique engagement with industry, which ensures that our courses equip you with up-to-date skills, relevant to the needs of employers. Located in Birmingham City Centre, **tic** students also enjoy all the facilities of a thriving international city, including culture and entertainment for all tastes and excellent local, regional and national transport links.

Industrial Placement

Students are encouraged to further enhance their career prospects by including an industrial placement in their course. This takes place after the second year of study and extends the course duration to four years.

As well as providing the workplace experience sought by many employers, a placement provides an invaluable opportunity for students to further develop their practical expertise, earn money and try out a potential career path. The **tic** placements team supports students throughout the placement process.

Learning approaches and Assessment

Students experience a wide variety of subjects and many different types of learning environments including lectures, tutorials, practicals and computer laboratories. Learning methods include the use of the latest networked computer systems and commercial standard software platforms. All courses incorporate a significant amount of project work to provide students with the opportunity to develop and apply their knowledge and are assessed through a combination of assignments, case studies, in-class tests, presentations and examinations.

Accreditation

The BEng (Hons) Electronic Engineering is accredited by the Institution of Engineering & Technology as satisfying academic requirements towards CEng. Holders of BEng (Hons) awards are required to complete further learning in order to meet the full requirements for CEng.

Entry Requirements

Applicants will be expected to have successfully completed at least one of the following or an equivalent qualification:

- Five GCSEs/GCEs with at least two GCE 'A2' levels, or an AVCE double award, with Mathematics to at least AS Level. English Language and a Science subject to at least GCSE Grade C.
- An Edexcel National Certificate/Diploma in Engineering with a significant Merit profile.
- A Degree Foundation Certificate, Access to HE Qualification, or equivalent, in Engineering.

A typical tariff point offer is 220 to 240 with AS qualifications used towards the tariff where appropriate.

Mature applicants who are able to demonstrate proficiency in Mathematics and written English will be considered for entry at Foundation Level.

Course Length

Full Time: 3 years
Sandwich: 4 years
Part Time: 3 years for entry with appropriate HNC or equivalent, 5 years if no exemptions apply. See Part Time grid for details.

For further Information

Course Enquiries
Birmingham City University
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www: www.tic.ac.uk

Module Grid – Full Time

Year 3

Individual Project D3	Analogue Electronics D2	Digital Signal Processing D3	Micro-Electronic System Design and Test D3	Embedded Systems D3
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Year 2

Market-led Business for Engineers D2	Analogue Electronics D2	Digital Electronics D2	Communication Systems D2	Embedded Systems D2
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Year 1

Mathematical Analysis D1	Electrical Principles D1	Electronics D1	Computer Network Basics D1	Computer Systems and Programming D1
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Project & Business Theme



Analogue Electronics Theme



Digital Electronics Theme



Communications Theme



Embedded Systems Theme

Module Grid – Part Time

Year 5

Project

Digital Signal
Processing D3

Micro Electronic
System Design & Test
D3

Summer

Market Led Business for Engineers D2

Year 4

Analogue Electronics
D3

Embedded Systems
D3

Digital Electronics D2

Year 3

Analogue Electronics
D2

Embedded Systems
D2

Communications
Systems D2

-----Normal HNC Entry-----

Year 2

Market Led Business
for Eng D2

Computer Systems
& Programming D1

Electronics D1

Year 1

Maths Analysis D1

Electrical Principles
D1

Computer Network
Basics D1

Brief Module Description

Year 1

Mathematical Analysis D1

Algebra, calculus, complex numbers, vectors, statistics, computer packages. Matrices, partial differentiation, differential equations, Laplace transforms, computer packages.

Electrical Principles D1

Basic DC and AC theory, network analysis, characteristics of non-sinusoidal waveforms, introduction to ECAD. Analysis of AC circuits using j notation. Fourier analysis. Transmission line theory. Electromagnetic theory. Motors and generators. Transformers.

Electronics D1

Combinational logic circuits, discrete electronic devices, transistor switching circuits, operational amplifiers. Discrete semiconductor devices. Operational amplifier circuits: integrator, differentiator, rectifier. Active filters, combinational and sequential logic, oscillators.

Computer Network Basics D1

LAN/WAN terminology, OSI, media, devices, standards, TCP/IP and addressing. Router configuration, routing protocols, access control lists, TCP/IP and Router operating systems.

Computer Systems and Programming D1

Software development, system concepts, programming, software documentation. Structured programming techniques, software document writing, quality.

Year 2

Market – led Business for Engineers D2

Market-led business analysis and planning: Marketing; Finance; Strategy and Change; General Management Principles; Business Applications of ICT; Professional Development; Communications.

Analogue Electronics D2

Operation of discrete devices (e.g. BJT, FET, SCR etc.). Diode and transistor modelling, introduction to feedback analysis and stability. Small signal modelling of transistors and amplifiers. Linear power amplifiers. Further operational amplifier applications.

Digital Electronics D2

Formal design methods for sequential systems, design and applications of Finite State Machines, ECAD tools, ADC and DAC circuits. Use of VHDL, applications of combinational and sequential circuits, microprocessor architecture and design and implementation using gate arrays.

Communication Systems D2

The communications channel, baseband transmission, digital modulation, transmission impairments. Radio wave propagation. Aerial design. Radio frequency signal generation and detection. Transmitter and receiver circuits. Satellite communications. Digital radio systems.

Embedded Systems D2

Concepts of software engineering applied to real-time systems, systems analysis and design. Introduction to hardware and software requirements used in monitoring/control applications, basic computer architecture, digital and analogue interfacing, transducers, open loop and on/off control applications and interrupts

Year 3

Individual Project D3

To provide opportunity to develop in-depth knowledge and skills in an area relevant to the course including the ability to manage activities and resources, and to generate, implement and report on solutions to meet project objectives.

Analogue Electronics D3

Implementation of active and switched-capacitor filters. Design of linear power supplies and operation of switched mode power supplies, power amplifier design. Further feedback analysis, high frequency modelling of transistors, programmable analogue IC devices and applications, noise.

Digital Signal Processing D3

Analogue and digital signal processing, analysis of digital signals, FFT, Z-Transforms, design of FIR and IIR filters, advanced digital signal processing.

Micro-Electronic System Design and Test D3

Computer architecture and organisation, finite state machine design methodology, use of VHDL for system design and simulation, logic synthesis, design implementation using PLD and FPGA devices. Digital system testing, Design for test in complex systems, ECAD.

Embedded Systems D3

Application and use of Real Time Operating Systems, closed loop control systems, further sensor/actuator interfacing, and development of autonomous guided vehicle.

Disclaimers

Birmingham City University's Disability Service aims to enable students with disabilities or learning support needs to make the most of their time at university. We regard disclosure of a disability as a positive thing and think it is important that students feel they can tell us about any disability they may have so we can try to support their individual needs.

If students have not made us aware of their disability or they feel they may have a disability please contact the Disability Service on 0121 331 5128, or email disability@bcu.ac.uk

This information is intended as a general guide to the University's (Faculty's) courses and facilities and forms no part of any contract between students and the University. Although reasonable steps are taken to provide the courses as described, the University cannot guarantee the provision of any course or facility. Any course may be altered or withdrawn owing to circumstances beyond the University's control. It is strongly recommended that prospective students contact the (relevant) faculty to obtain the most up-to-date course information. For full terms and conditions please log on to www.bcu.ac.uk/misc/legal.html

Birmingham City University promotes equality of opportunity in respect of every aspect of its provision. University policy and practice will seek to provide an environment that is free from discrimination against students, staff and others. The University and its staff will ensure that all prospective students are treated solely on the basis of their merits, abilities and potential.

The University will seek to prevent discrimination on the grounds of race, colour, ethnic origin, nationality, religious belief, gender, sexual orientation, disability, age, marital status, family circumstances, citizenship, social and economic status, or any other irrelevant individual differences.

For full details of the University's Equal Opportunities Policy please log on to www.bcu.ac.uk

All courses described as being delivered by Birmingham City University include those provided or delivered by the University and by companies within the Birmingham City University group.

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A member of the Birmingham City University Group

Qualification awarded by Birmingham City University