

Birmingham City University
Technology Innovation Centre

BSc (Hons) Computing & Electronics



Formerly UCE Birmingham



BSc (Hons) Computing and Electronics

Introduction

Many undergraduate courses cover computer science and electronics as discrete disciplines, with little or no relation to actual practice or technical operations within business. This course has been specially designed to address this weakness and takes account of the direct needs of industry which requires specialists covering a broader knowledge range.

This course produces professional technologists with a broad mix of theoretical knowledge and practical skills in software engineering, digital electronics, embedded systems, communication networks and business management.

As a leading Cisco Academy Training Centre, tic has designed this course to incorporate the latest vendor specific curriculum providing students with the opportunity to work towards professional qualifications, such as the Cisco Certified Network Associate (CCNA), as part of their undergraduate studies.

This exceptional partnership provides an opportunity for students to study alongside professionals in the computing, IT and networking industry and provides opportunity for additional qualifications and experience upon graduation.

Course Aims

To provide graduates with the following skills and knowledge:

- The principal electronic, microelectronic and communication technologies that underpin system design, practice and application
- Advanced software engineering design and application of computer systems with emphasis on technological considerations
- Computer programming relevant to the development of real-time systems
- Analytical techniques and models appropriate to computing and electronic applications
- Use of relevant principles and techniques for application and evaluation of software tools for the implementation of both hardware and software systems
- The organisational, teamwork and practical management approaches employed throughout a typical system design process cycle

Career Prospects

Typical roles that graduates of the course can undertake include:

- Providing technical, software or applications support or training
- Specifying, designing or implementing software systems or applications
- Specifying, designing or implementing hardware systems or applications
- Integrating the above functions in industrial and commercial organisations

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.

Students 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 students 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 environment 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 BSc (Hons) Computing and Electronics course is accredited by the Institution of Incorporated Engineers as satisfying academic requirements for IEng.

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. Maths, English Language and a Science subject to at least GCSE Grade C.
- An Edexcel National Certificate/Diploma in Engineering with a significant Merit profile. Maths, English Language and a Science subject to at least GCSE Grade C.
- A Degree Foundation Certificate, Access to HE Qualification, or equivalent, in a relevant subject.

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 more details.

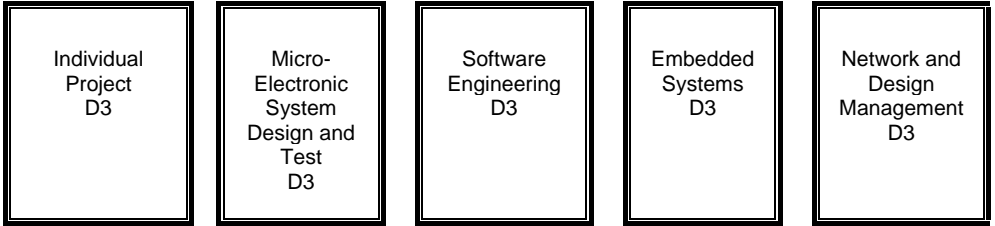
For further Information

Course Enquiries
Birmingham City University
Technology Innovation Centre
Millennium Point
Curzon Street
Birmingham
B4 7XG

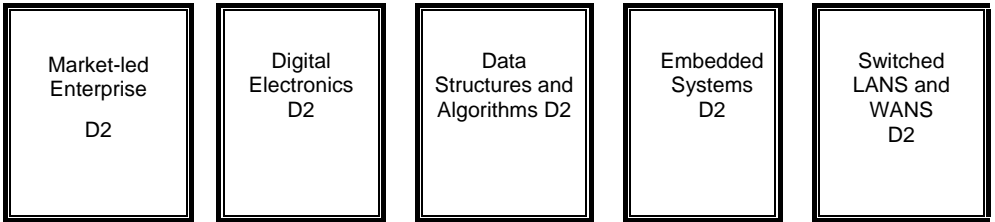
Tel: 0121 331 6400
Fax: 0121 331 5401
Email: enquiries@tic.ac.uk
www: www.tic.ac.uk

Module Grid – Full Time

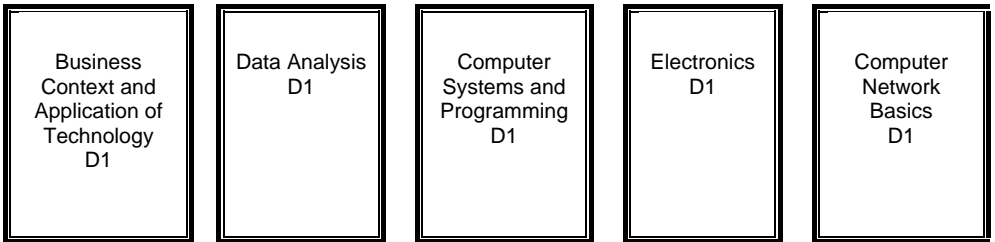
Year 3



Year 2



Year 1



Business Management Theme

Digital Electronics Theme

Software Engineering Theme

Embedded Systems Theme

Communication Networks Theme

Module Grid – Part Time

Year 5

Individual Project
D3

Network Design &
Management
D3

Microelectronic
Systems Design & Test
D3

Summer

Market Led Enterprise D2

Year 4

Software Engineering
D3

Embedded Systems
D3

Switched LANS &
WANS
D2

Year 3

Data Structure &
Algorithms
D2

Embedded Systems
D2

Digital Electronics
D2

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

Year 2

Market Led Enterprise
D2

Electronics
D1

Computer Systems &
Programming
D1

Year 1

Business Context and
Application of
Technology
D1

Data Analysis
D1

Computer Network
Basics
D1

Brief Module Description

Year 1

Business Context and Application of Technology D1

A contextualised introduction to industry and business concepts within a technology intensive business environment and development of core business skills including research, group work, planning, report writing and presentations.

Data Analysis D1

Algebra, equations, graphical methods, statistics and probability, matrices, business mathematics, networks, linear programming, trend analysis, set theory.

Computer Systems and Programming D1

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

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.

Year 2

Market –led Enterprise D2

Business enterprise and careers, marketing planning, business environment and resource analysis, objective setting and basic strategy. Work planning.

Financial planning: market-based budgets, risk analysis, financial forecasts and statements. Project planning.

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.

Data Structures and Algorithms D2

Arrays, records, bit operators, sequential and random file I/O, dynamic memory allocation, fixed and variable length records, iteration, sorting, linked lists. Recursion, randomising, trees and balancing, heaps, hash tables, multilevel and function pointers, graph applications and algorithms, geometric algorithms.

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.

Switched LANS and WANS D2

VLSM, RIPv2, OSPF, EIGRP, VLANs, STP, VTP and switch configuration. ISDN/BRI, Frame Relay/PRI, Implementing LANs and WANs, DHCP, NAT/PAT, PPP, DDR, network management, optical and security.

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.

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.

Software Engineering D3

Software specification and verification, implementation, debugging and testing, advanced techniques and principles, software life cycle, fuzzy logic, genetic algorithms, expert systems, neural networks and safety critical software.

Embedded Systems D3

Development of fully engineered embedded control systems, real-time operating systems, embedded system programming, embedded systems programming processor architectures, embedded microprocessor systems and software development for control and communication applications

Network and Design Management D3

Network operating systems, network management, network management protocols, network monitoring and management platforms. Queuing theory, network design, simulation and modelling.

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.

technology innovation centre
millennium point curzon street
birmingham B4 7XG

phone +44 (0)121 331 6400
fax +44 (0)121 331 5401

e-mail course.enquiries@tic.ac.uk
www.tic.ac.uk

A member of the Birmingham City University Group

Qualification awarded by Birmingham City University