

Birmingham City University
Technology Innovation Centre

BSc (Hons) Computer Networks & Security



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Introduction

Many of the issues concerning security relate to systems and devices in which failures in protection can endanger human life. The safety and viability of industrial and commercial systems and the safety of the environment continually undermine public confidence and fuel criminal activity. Combating fraud and malice, together with the requirements for handling errors and mischance are core objectives in the development of secure network and communication systems. National schemes such as passports and identification cards designed to combat terrorism and international co-operative schemes for finance and transaction handling requiring personal identification clearly demonstrate the future demand for this specialist discipline.

This course produces graduates with the capability to design, implement and evaluate identification, data capture and communications networks and associated security protocols. Attention to security will bring the student an intriguing, richly interesting and legally rewarding world of coding, protocols, attack and defence scenarios, technology and innovation, to a level that provides attractive career prospects.

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:

- An understanding of the systems approach, encompassing the themes of business management, security technologies, product and asset tracking and traceability, programming for networks, security systems theory and communications networks
- Analytical and modelling techniques to specify secure computer networks and systems
- Skills to identify and analyse the computer networking and security requirements of an organisation to support achievement of its business goals
- Skills to specify and develop elements of a secure internet system, integrating hardware, software and business elements
- Sound understanding of commercial, social, ethical, legal and business factors which influence technical solutions to solve problems
- A qualification designed to satisfy accreditation requirements of the relevant professional bodies

Career Prospects

The security landscape is changing so dramatically that industry requires flexible, multi-skilled individuals, passionate about secure networking practice, who are able to adapt to this change. Typical routes of employment that could lead from this course include:

- Providing technical, software or applications support or training
- Specifying, designing or managing secure communications networks or the applications they support
- Implementation and/or evaluation of secure networks

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 them 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) Computer Networks and Security 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 a relevant subject 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 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

Individual Project D3	Personal Identification and Authentication Systems D3	Client Server Integration D3	Advanced Networking Technologies D3	Network Design and Management D3
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Year 2

Market-led Enterprise D2	Data Capture Technologies D2	Data Application Programming D2	Security Systems Theory D2	Switched LANS and WANS D2
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Year 1

Business Context and Application of Technology D1	Electronic Technology D1	Visual Programming D1	Data Analysis D1	Computer Network Basics D1
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Business Management Theme



Security Technologies Theme



Programming for Networks Theme



Security Systems Theory Theme



Communication Networks Theme

Module Grid – Part Time

Year 5

Project	Network Design & Management D3	Advanced Network Technologies D3
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Summer

Market Led Enterprise D2

Year 4

Personal Identification & Authentication Systems D3	Client Server Integration D3	Switched LANS & WANS D2
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Year 3

Data Capture Technologies D2	Data Application Programming D2	Security Systems Theory D2
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-----Normal HNC Entry-----

Year 2

Market Led Enterprise D2	Visual Programming D1	Electronic Technology D1
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Year 1

BCAT D1	Data Analysis D1	Computer Network Basics D1
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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.

Electronic Technology D1

Basic dc and ac theory, electrical measurements, communications systems fundamentals, signals and their characteristics. PC hardware. Digital and analogue principles, ADC, DAC, and introduction to communication principles. Computer architecture and PC Hardware.

Visual Programming D1

System concepts, programming fundamentals and software design. Exploration of GUI creation. System and class design, debugging and testing, writing of software documentation. Investigation into .NET framework both full and compact.

Data Analysis D1

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

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.

Data Capture Technologies D2

Data analysis, database design and implementation, query languages. Nature and capability of data carrier technologies, data structures and associated appliances, product and asset track and traceability systems, including associated facilities for supporting security.

Data Application Programming D2

The module will show students how to implement strategies to access information from a range of data repositories. Students will develop and programme software applications designed to manipulate that data and represent it appropriately to the user.

Security Systems Theory D2

Security solutions, data/information, networks, communications, operating systems and physical security, legal and ethical issues in systems security and penetration testing. Error control theory, cryptography, steganography, quantum cryptography, cryptographic file systems, tamper resistance, security monitoring, intrusion detection systems, emissions analysis; risk assessment and security management; security and security audit standards and their significance in security management.

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.

Personal Identification and Authentication Systems D3

Classification and attributes of personal identification techniques, integrated data carrier and biometric systems, application and security attack considerations on integrated systems, ethical, legal and standardisation issues, including attention to privacy.

Client Server Integration D3

Client and server system architectures, middleware, enterprise wide structures, distributed systems, web systems; SOAP, CORBA, J2EE, XML and .NET.

Advanced Networking Technologies D3

Advanced routing, wireless, security and advanced design consideration for scaleable networks, software and hardware based firewall.

Network Design and Management D3

Network operating systems, network management, network management protocols, network monitoring and management platforms, introduction to 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