

# Birmingham City University Technology Innovation Centre

## Undergraduate Programme

### Programme Specification

#### BSc (Hons) Forensic Computing

<b>Date of Course Approval/Review</b>	<b>Version Number</b>	<b>Version Date</b>
<b>29 April 2008</b>	<b>2.02</b>	<b>20 May 2008</b>



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## Definitive Documents and Version Control

This document has a version number and reference date in the footer. Documents originating from the 1999 scheme follow the sequence 1.01, 1.02, 1.03 etc. Documents originating from the 2004 scheme begin with 2.01 as the first released version and follow the same sequence.

The process leading to introduction of new courses, and major changes to courses follows **tic** procedure QA 1 and culminates in approval by the University's Senate.

The process leading to introduction of minor changes to modules and courses follows **tic** procedure QA 5 and culminates in approval by the Dean.

The reference date will be that of the approval event, minor changes board, or other meeting at which formal consideration was given.

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 is summarised in the table below and further information relating to past versions can be obtained from the **tic** Registry.

### Version history

Version	Version Date	Event	Date of event	Authorised by
2.01	7 April 2008	Approval meeting	29 April 2008	Dean of Faculty
2.02	20 May 2008	Approval meeting - conditions	29 April 2008	Panel Chair

# Programme Specification

## BSc (Hons) Forensic Computing

**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 (1) at <https://web.tic.ac.uk> , (2) in the Module Specifications and (3) in 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.

The information from this specification may be selectively extracted and included in documents that are more appropriate for students, intending students and employers.

<b>1</b>	<b>Awarding Institution / Body:</b>	Birmingham City University
<b>2</b>	<b>Teaching Institution:</b>	Birmingham City University / Technology Innovation Centre
<b>3</b>	<b>Programme accredited by:</b>	
<b>4</b>	<b>Final Award:</b>	BSc (Hons)
<b>5</b>	<b>Programme Title:</b>	Forensic Computing
<b>6</b>	<b>Mode of Study:</b>	FT/PT/SW
<b>7</b>	<b>Language of Study:</b>	English
<b>8</b>	<b>UCAS Code:</b>	FG44

<b>9</b>	<b>Relevant subject benchmark statements and other external and internal reference points used to inform programme outcomes:</b>	
		Engineering

## **10 Aims of the programme**

### **The programme aims to provide learners with:**

broadly-based and stimulating curriculum which combines study of IT systems, security systems, computer law and evidence, communication network, software programming and business management relevant to the discipline of computer forensics investigation;

curriculum which provides a range of subjects to facilitate the development of abilities, pursuit of interests and promotion of wide career choice;

range of transferable and marketable skills and knowledge relevant to employment in a variety of roles both within and outside of Computer Forensics and associated industries;

analytical skills in the use of forensic investigation hardware and software tools for investigation and examination of digital evidence;

enjoyable and rewarding educational experience which places emphasis on active and participative learning;

understanding of the legal and ethical issues and concepts relating to information systems and security;

analytical and modelling techniques to specify secure computer networks and systems;

sound understanding of commercial, social and business factors which influence technical solutions to solve problems;

qualification designed to satisfy accreditation requirements of the relevant professional bodies.

**11 Intended learning outcomes and the means by which they are achieved and demonstrated: the programme provides learners with opportunities to develop and demonstrate knowledge and understanding, skills and other attributes as follows:**

**Knowledge and understanding**

<p><b>Knowledge and understanding of:</b>  digital data preservation, recovery, analysis and evidence documentation procedures for legal and commercial use;</p> <p>principles and underlying technologies of computer and mobile digital device operating systems;</p> <p>programming skills for developing and evaluating computer forensics investigations;</p> <p>techniques and technologies employed by forensic investigators for computer/digital device hardware and software system surveillance;</p> <p>principle legal issues, offences and liabilities that arise in the context of computer use and misuse;</p> <p>business management and organisational theories and techniques applied to successful secure networking enterprise and the legal and regulatory systems within which they operate;</p> <p>organisational, teamwork and practical management approaches employed throughout a typical computer forensic investigation process cycle;</p> <p>relevant ethical, legal and professional issues applicable to rapidly evolving technology based business.</p>	<p><b>Teaching, learning and assessment methods used:</b>  knowledge and understanding are acquired through formal lectures, computer based practical sessions, laboratory experiments, seminars and other directed independent learning activities;</p> <p>throughout the course, learners are encouraged to broaden their knowledge of the subject area;</p> <p>a range of assessment methods are employed. Assessment activities include practical work, individual and group work, presentations, written coursework, laboratory experimentation, examinations (seen and unseen, open and closed book). The assessment criteria for each module being published within module guides and assignment briefs.</p>
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### Skills and other attributes

<p><b>Intellectual / cognitive skills:</b> use proficiently information and materials from a variety of sources;</p> <p>draw independent conclusions based on a rigorous, analytical and critical assessment of argument, opinion and data;</p> <p>document and report technical and legal findings in a clear and concise manner dependent on audience requirements (both qualified and non-technical);</p> <p>recognise and apply appropriate managerial, technical, practical and operational techniques for a diverse range of issues and problems;</p> <p>analyse data retrieved from computer and digital systems ;</p> <p>select appropriate software tools and techniques for the implementation of computer forensic applications;</p> <p>evaluate and appraise emerging ICT and forensic investigation technologies;</p> <p>evaluate, select and develop appropriate solutions to computer forensics problems;</p> <p>critically evaluate strategies employed to recover digital evidence.</p>	<p><b>Teaching, learning and assessment methods used:</b> intellectual skills are developed through formal lectures, technical and musical practical areas, laboratory experiments, seminars and directed independent learning activities;</p> <p>analytical skills are developed through coursework tasks that encourage problem solving using a range of systems and technologies relevant to forensic computing;</p> <p>assessment methods include practical project work, individual and group assignments, written coursework, laboratory experimentation, examinations (seen and unseen, open-and closed-book).</p>
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<p><b>Practical, research and independent learning skills:</b></p> <p>plan and undertake tasks, work to deadlines, and accept accountability for learning decisions;</p> <p>apply appropriate methodologies and sources for research;</p> <p>collect relevant information, assimilate knowledge, marshal a coherent and rational argument, and relate theory and practice of computer forensics and laws of evidence;</p> <p>use appropriate test equipment and software tools to undertake investigations and to process data;</p> <p>identify and apply appropriate technical and regulatory standards;</p> <p>dismantle/assemble disconnect/connect components / hardware/communication networks devices and systems.</p>	<p><b>Teaching, learning and assessment methods used:</b></p> <p>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;</p> <p>assessment for practical work can include laboratory demonstrations and tests as well as practical activities which may be written up as coursework;</p> <p>research and independent learning skills are central to the programme and are developed throughout the course. The Learning Centre provides comprehensive internet and text resources and specialist staff to provide tutorial support for skills development;</p> <p>as well as developing and applying skills through assignment work, particular emphasis on research work is associated with the year 1 and 2 Professional ICT Studies and Market-led Enterprise modules and the final year project;</p> <p>independent learning is encouraged through research tasks for assignments and the final year project, and in the requirement to plan work schedules to meet deadlines for coursework submission;</p> <p>assessment activities include practical work, individual and group work, presentations, written coursework, laboratory experimentation, examinations (seen and unseen, open and closed book).</p>
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<p><b>Transferable / key skills:</b></p> <p>work with, and relate effectively to, others;</p> <p>manage time and prioritise workloads;</p> <p>make effective oral, written and visual presentations;</p> <p>access and make appropriate use of relevant numerical and statistical information;</p> <p>make effective use of information and communications technologies, including word and data processing packages, the internet, email and electronic information retrieval systems;</p> <p>plan career development.</p>	<p><b>Teaching, learning and assessment methods used:</b></p> <p>transferable/key skills are core to the learning strategy of the programme. They are pervasive, and are incorporated into modules and assessments as appropriate, e.g. team-working skills are fostered via group, task-based practical projects. Reflection and self awareness are fostered by keeping logbooks and submitting self assessment documentation in support of personal performance;</p> <p>the use of information technology plays an active role throughout the course;</p> <p>assessment methods include practical projects, presentations, coursework, peer-and self-assessment;</p>
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## **12 Programme structure and requirements, levels, modules, credits and awards**

The BSc (Hons) programme is normally studied over three years full-time or five years part-time, and students may if they wish move between full and part-time modes of attendance. The academic year runs from September to June. The course is divided into study units called modules, each of 24 credits. Students complete 120 credits at levels 4, 5 and 6 (corresponding to years 1, 2 and 3 of the full-time programme). Each 24 credit module represents 240 hours of student learning and assessment.

The Faculty's BSc (Hons) degrees can be studied in sandwich mode. Students who, in addition to satisfying requirements for an honours degree, successfully complete an approved industrial placement between levels 5 and 6 (full time years 2 and 3) obtain the award of a sandwich honours degree.

The structure of the course, the modules, levels and credit ratings, and the awards which can be gained are shown below.

#### Stage 1 Level 4

Module number	Module name	Credit
FM4057	<p><b>Computer Forensic Fundamentals D1</b></p> <p>The module introduces the fundamental principles of computer hardware and digital data storage devices to develop the underpinning knowledge and skills required to conduct a computer forensic investigation. Topic areas include computer and device systems, digital storage devices, system authentication, forensic investigation, log and history files, data hiding techniques, file signature and computer surveillance principles.</p>	24
FM4025	<p><b>Electronic Technology D1</b></p> <p>This module provides a foundation for the study of electronics and computer systems, introducing basic analogue and digital system theory and characteristics. The module introduces the following topics: ac and dc theory, electrical measurement, signals and their characteristics, digital and analogues principles, ADC and DAC converters, computer hardware and architecture, audio visual electronics and communication interfaces.</p>	24
FM4045	<p><b>Computer Network Basics D1</b></p> <p>This module develops awareness of communication standards and their role within the data and communications industry and provides an introduction to various LAN technologies employed in a modern network. Topics include: LAN/WAN terminology, OSI, media, devices, standards, TCP/IP and addressing. Router configuration, routing protocols, access control lists, TCP/IP and router operating systems.</p>	24
FM4056	<p><b>Systems Programming D1</b></p> <p>This module introduces computer programming principles and practices for conducting analysis of artefacts pertinent in a forensic investigation of a computer system. Topics include: data types, decision &amp; selection statements, repetition statements, data structures, file handling, testing &amp; debugging and program design.</p>	24
FM4055	<p><b>Professional ICT Studies D1</b></p> <p>A contextualised introduction to industry and business concepts within an ICT technology intensive business environment and development of core business skills including research, group work, planning, report writing and presentations. Students are introduced to study skills, personal and organisation ethics and social responsibilities as a Computer Forensic IT professional.</p>	24

**Award: Cert HE (120 credits)**

## Stage 2 Level 5

Module number	Module name	Credit
FM5073	<p><b>Switched LANs and WANS D2</b></p> <p>The module will introduce the technologies employed for wide area networking and application of advanced switching technologies for local area networks. The module will cover the following topics: 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 administration and management. Optical networking, transmission and multiplexing.</p>	24
FM5071	<p><b>Security Systems Theory D2</b></p> <p>This module provides the necessary theoretical framework, foundations and practical support for ICT security solutions. The module will cover the following topics: 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; tamper resistance, intrusion detection systems, emissions analysis; risk assessment and security management; security and security audit standards.</p>	24
	<p><b>The English Legal System D2</b></p> <p>This module is designed to provide basic knowledge and skills required to understand how the English legal system is influenced, structured and administered. The module also provides an essential grounding for the study of computer law and aspects of the law of evidence. The module topics include: sources of law, the criminal justice system, legal research, sources of legal information,</p>	24
	<p><b>Computer / Mobile OS for Forensic Examiners D2</b></p> <p>This module builds on prior material to explore, in depth, operating system concepts and how they are applied in a variety of platforms from server to PC, mobile and embedded operating systems.</p>	24
FM5057	<p><b>Market-led Enterprise D2</b></p> <p>This module develops students' understanding of the business environment related to their course of studies, including aspects of business ethics and professional conduct, introducing the marketing process. The module covers the following topics: business enterprise and careers; marketing planning; business environment and resource analysis, objective setting and basic strategy. Financial planning: market-based budgets, risk analysis, financial forecasts &amp; statements. Project planning.</p>	24

## Stage 3 Level 6

Module number	Module name	Credit
FM6008	<p><b>Advanced Networking Technologies D3</b></p> <p>This module will further develop and extend knowledge and skills in the design, evaluation and deployment of new and emerging network technologies, including wireless. Advanced routing techniques and security technologies are also explored. Other topics include security and advanced design consideration for scaleable networks, software and hardware based firewalls.</p>	24
	<p><b>Computer Law and the Law of Evidence D3</b></p> <p>This module is designed to provide students with an understanding of the legal controls over computer use and misuse together with sufficient of the laws of evidence (civil and criminal) for the purposes of compiling and delivering expert testimony (orally or in writing). The module topics include: computer crime, controls on data storage and use, civil liability, liability of professionals, law of evidence.</p>	24
	<p><b>Forensic Investigation for IT Systems D3</b></p> <p>This module develops ability to recover and analyse forensic IT evidence from stand-alone and networked PCs. Topics include data acquisition and drive duplication, data recovery, password handling, advanced file-system analysis, application and file binding, file mangling, Windows registry auditing, process analysis, forensic investigation software tools, advanced system investigation, covert surveillance, data destruction.</p>	24
	<p><b>Digital Device Forensics D3</b></p> <p>This module will focus on developing in-depth awareness and the practical skills required for the investigation, recovery and analysis of digital evidence from digital/mobile devices, and the preparation of evidence for presentation in a Court of Law. The topics covered include: hard-disk geometry, investigation of mobile phones, SIMs and USIMs, PDA and iPod forensics, games consoles, sat navs, digital CCTV systems and peripherals.</p>	24
FM6020	<p><b>Individual Project D3</b></p> <p>The final year project provides opportunity to develop in-depth knowledge and skills in an area relevant to the course and ability to manage actives and resources and to generate, implement and report on solutions to meet project objectives.</p>	24

Award: BSc (Hons) (360 credits)

## Course Structure – BSc (Hons) Forensic Computing – Full Time

### Level 6

Individual Project D3  FM6020	Digital Device Forensics D3	Forensic Investigation for IT Systems D3	Computer Law and the Law of Evidence D3	Advanced Networking Technologies D3  FM6008
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Optional Sandwich Year between Level 5 and 6 (Years 2 and 3)

### Level 5

Market-led Enterprise D2  FM5057	Computer / Mobile OS for Forensic Examiners D2	Security Systems Theory D2  FM5071	The English Legal System D2	Switched LANs and WANS D2  FM5073
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### Level 4

Professional ICT Studies D1  FM4055	Systems Programming D1  FM4056	Electronic Technology D1  FM4025	Computer Forensic Fundamentals D1  FM4057	Computer Network Basics D1  FM4045
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*Business  
Management  
Theme*

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*IT System  
Forensics  
Theme*

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*Security &  
Digital  
Evidence  
Theme*

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*Information  
Technology  
Law Theme*

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*Computer  
Networking  
Theme*

## Course Structure – BSc (Hons) Forensic Computing (Part Time)

### Year 5

Individual Project  
D3

Forensic  
Investigation for IT  
Systems  
D3

Computer Law & the  
Law of Evidence  
D3

### Year 4

Market-Led  
Enterprise  
D2

Digital Device  
Forensics  
D3

Advanced Network  
Technologies  
D3

### Year 3

Security Systems  
Theory  
D2

The English Legal  
System  
D2

Switched LANS &  
WANS  
D2

### Year 2

Professional ICT  
Studies  
D1

Computer / Mobile  
Operating Systems  
for Forensic  
Examiners  
D2

Computer Network  
Basics  
D1

### Year 1

Systems  
Programming  
D1

Electronic  
Technology  
D1

Computer Forensic  
Fundamentals  
D1

### **13 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 those needs:

an induction programme dealing with orientation and the dissemination of essential information;

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, Course Director and Programme Manager, 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.

## 14 Criteria for admission

All applicants must have GCSE (grade C or above) in Mathematics and English Language, or equivalent. In addition, applicants should have one of the following, for which the typical tariff offer is 220 points for Curriculum 2000, or equivalent for other qualifications. Actual tariff offers may vary from 220 points.

Qualification	Requirements
Curriculum 2000, A Levels	Five GCSEs/GCEs including at least two subjects at A2 level. Points tariff can include AS level
Curriculum 2000, AVC.	Two 6-unit or one 12-unit AVCE.
Irish Leaving Certificate	Passes in four subjects at the higher grade.
Scottish Certificate of Education	Passes in four subjects at the higher grade.
International Baccalaureate or European Baccalaureate	Typically 28 points
BTEC/Edexcel National Certificate/National Diploma	For National Diploma, Typically M, M, P
A pass in a recognised Access or Foundation Year course	
An appropriate Advanced General National Vocational Qualification	
A professional qualification of an appropriate standard	
A qualification deemed equivalent to one of the above	

Other learning and experience may be considered for entry to the programme. A student may be allowed entry to the course if he or she does not have the standard entry qualifications but can provide evidence of necessary knowledge and skills to successfully enter and complete the programme.

Applicants with a Higher National Certificate or Higher National Diploma, including Merits, in an appropriate subject, or an equivalent qualification, may be offered entry with advanced standing.

UCAS applicants are invited to visit the **tic** during open days held through the academic year. Open day programmes include a tour of facilities and an introduction to the **tic**'s courses and activities. Meetings are arranged between course tutors and prospective students to ensure opportunity is provided for individual questions and clarification of the course content.

## 15 Methods for evaluation and improvement of quality and standards

<b>Committees:</b>	<b>Mechanisms for review and evaluation:</b>
Board of Studies Examination Board Learning Management Committee Faculty Board Learning Quality Committee	Module reviews Course review and re-approval events Accreditation by professional bodies Annual Monitoring Report Student feedback questionnaires Annual staff appraisal External Examiners' Reports Course team meetings