

Programme Specification

Department of Computing and The Digital Environment

BEng Digital Forensics and System Security

June 2009

**Programme Specification for
Digital Forensics and System Security**

| 1 Available Award(s) and Modes of Study | | | |
|---|--|------------------|-------------------|
| Title of Award | Mode | UCAS Code | FHEQ Level |
| BEng Honours Digital Forensics and System Security | FT SW PT | G550 | Honours |
| BEng Digital Forensics and Systems Security | 3/4/6 years | | Intermediate |
| Qualification descriptors can be found at http://www.qaa.ac.uk/crntwork/nqf/ewni2001/annex1.htm | | | |
| 2 Awarding Institution/Body | Coventry University | | |
| 3 Teaching Institution | Coventry University | | |
| 4 Internal Approval/Review Dates | Date of latest review: 27 June 2007 Date for next review: Stages 2/3 subject to review during academic year 2009/10 | | |
| 5 Programme Accredited by | None at present | | |
| 6 Accreditation Date and Duration | Not applicable | | |
| 7 QAA Subject Benchmark Statement(s) and/or other external factors | The QAA Engineering and Computing Subject Benchmark statements are partially relevant to this programme. | | |
| 8 Date of Programme Specification | June 2009 (All the CDE undergraduate courses were revised in June 2009) | | |
| 9 Programme Manager/Course Tutor | Hisbel Arochena | | |

10 Educational Aims of the Programme

To produce graduates with the knowledge and understanding needed to make a significant early contribution to the digital forensics and system security industry and to society as professional practitioners.

To develop the intellectual abilities necessary to participate in contemporary forensics and security projects.

To develop the practical skills expected of a professional working in the area of digital forensics and system security.

To encourage the formation of general transferable skills and the personal attitudes and determination necessary to enable the student to make a valuable contribution throughout a successful career in industries involving digital forensics and system security or related activities. This to include opportunities to engage in Personal Development Planning (PDP).

To provide a general education consistent with Honours level of the QAA's Framework for Higher Education Qualifications.

To provide government, industry and commerce with the graduates they need.

To further the University mission by providing an excellent education enriched by work-related learning.

11 Intended Learning Outcomes

This programme partially satisfies the Engineering benchmark statements and Coventry University's Code of Practice for Academic and Professional Skills Development.

Section 20 maps the learning outcomes described below to the programme's mandatory and option modules (these are identified in section 19).

Section 21 shows the capabilities that students will be taught, given the opportunity to practise and will be assessed in.

11.1 Knowledge and Understanding

On successful completion of the programme a student should be able to demonstrate knowledge and understanding of

KU1 Digital forensics

KU2 Computer system and network security

KU3 The broader technical principles underlying digital computer and communication systems

KU4 Mathematical principles and numeracy necessary to underpin the discipline

KU5 Legal, management and ethical topics relevant to the discipline

The principal teaching, learning and assessment methods normally used to enable outcomes to be achieved and demonstrated are identified below.

| | Teaching and Learning | Assessment |
|-----------|--|---|
| KU1 - KU5 | Lectures Seminar discussions Tutorials Independent learning | Examinations Coursework assignments In-class tests Student presentations |

11.2 Cognitive (thinking) Skills

On successful completion of the programme a student should be able to

CS1 Evaluate and apply methodologies to extract digital evidence from contemporary products and systems

CS2 Analyse the security threats in operating digital technologies and propose suitable counter measures

CS3 Develop hardware and software components for use in digital forensics or security research

CS4 Search and evaluate information sources

CS5 Adopt an holistic approach to digital forensics and security in a law enforcement or commercial context

The principal teaching, learning and assessment methods normally used to enable outcomes to be achieved and demonstrated are identified below.

| | Teaching and Learning | Assessment |
|-----------|--|---|
| CS1 - CS5 | Project work Problem based learning Laboratories Design exercises | Reports Demonstrations In-laboratory tests Student presentations |

11.3 Practical Skills

On successful completion of the programme a student should be able to

PS1 Use sophisticated test equipment in investigative work

PS2 Deploy security measures to ensure secure operation of computer/communication systems

PS3 Prepare and assimilate evidential documentation in accordance with legal requirements

PS4 Apply computer software tools for extraction of evidence and assessment of security

PS5 Connect and configure digital products and systems

The principal teaching, learning and assessment methods normally used to enable outcomes to be achieved and demonstrated are identified below.

| | Teaching and Learning | Assessment |
|-----------|--|---|
| PS1 - PS5 | Project work Problem based learning Laboratories Design exercises | Reports Demonstrations In-laboratory tests Student presentations |

11.4 Transferable Skills

On successful completion of the programme a student should be able to

TS1 Communicate effectively in various modes

TS2 Work as a member of a team

TS3 Apply information and communication technology tools

TS4 Manage self, resources and time

TS5 Learn independently and develop yourself

Transferable/key skills are generally incorporated within modules (see section 21) and related to relevant assessments as appropriate. Self-directed learning forms an element of all modules and the necessity to work within tight deadlines is an essential requirement across the curriculum. The ability to communicate orally and in writing will be developed across the range of modules.

The wide range of assessment techniques will ensure that students are given every opportunity to demonstrate their skills in these areas.

All students are given opportunities to engage in Personal Development Planning using PebblePad.

Modules offered through the Add+vantage scheme will provide opportunities for skills development and support for Personal Development Planning.

12 Programme Structure and Requirements, Levels, Modules, Credits and Awards

Modules within the programme, their status (whether mandatory or optional), the levels at which they are studied, their credit value and pre/co requisites are identified in section 19

The programme may be studied in the following modes of attendance:

- Full-time over three years of study. This will typically involve at least 15 hours each week of timetabled activity with additional independent learning.
- Sandwich with a professional training placement being taken for one year between the second and third years of study.
- Part-time. The programme may be followed in a part-time mode by attending a selection of the modules scheduled for full-time students. A special timetable to facilitate part-time attendance is not provided.

The course includes modules from the Add+vantage Coventry University (ACU) scheme intended to develop employability, enterprise and leadership skills.

| Curriculum | All students must study: |
|------------|--|
| Stage 1 | 109SE Digital Forensics Fundamentals 110CT Object Oriented Programming 120CT Computer Architecture and Networks 124MS Logic and Sets 160CDE Software Engineering Fundamentals 100CDE Professional Skills 1 + two 10-credit ACU modules Modules at level 1 are intended to lay a firm foundation for further study of digital forensics and system security and prepare students from diverse backgrounds for specialist subjects. |
| Stage 2 | 216SE Security Planning, Incident Response & Disaster Recovery 210CT Advanced Programming 207SE Operating Systems and Security 200CT Group Project - Computing 250CT System Architecture and Networks 290CT Computer Laws and Regulatory Framework of Digital Forensics + one 10-credit ACU module Modules at level 2 cover more specialised subjects appropriate to |

| | |
|--------------------------------|---|
| | the course themes along with legal issues and group project work. |
| Optional Professional Training | All students are strongly encouraged to spend a year on professional training between the second and third academic years. Assistance in organising this is provided by the Faculty's Professional Training Office. Academic credit may be earned through the professional training period by passing the assessment requirements of associated module 250EC. |
| Stage 3 | 303CDE Individual Project, 307SE Multimedia Technology, 318SE Data Recovery and Advanced Digital Forensic Analysis, 350CT Systems Security, 360CT Advanced Network Management + one 10-credit ACU module Modules at level 3 prepare students for professional practice. The project module gives an opportunity to develop technical and management of capabilities that can be presented to potential employers. |

Progression requirements are based on standard University Academic Regulations.

| | |
|--|--|
| To progress a student must normally achieve the indicated minimum number of credits at the previous stage and meet essential pre-requisites. | |
| Stage 1 to stage 2 | 100 credits from level 1 modules including 109SE, 100CDE, 110CT, 120CT |
| Stage 2 to stage 3 | 100 credits from level 2 modules including 207SE or 210CT, 216SE, 250CT (and 124MS from level 1) |

Awards

To achieve the award of an Honours or Unclassified degree in Digital Forensics and System Security from study on the programme a student must achieve the minimum credits specified in the University Academic Regulations. The modules passed must include the following course specific content.

| | |
|----------------------------|-------------------------|
| For Honours Degree | For Unclassified Degree |
| 303CDE and 350CT and 318SE | 350CT or 318SE |

Honours classification is based on the calculation method described in the University Academic Regulations. The modules counted in the classification must include 303CDE.

Alternative Awards

Students failing to meet the award requirements of the Digital Forensics and System Security programme will be considered for alternative awards for which they satisfy the credit score count and other requirements. Specifically: Diploma of Higher Education, and Certificate of Higher Education. The requirements for these awards are as specified in the University Academic Regulations.

13 Support for Students and their Learning

New entrants to the programme must attend a 1-week induction programme. This familiarises them with the structure and operation of their programme and the wider facilities of the University. It also covers essential Health and Safety issues.

Student learning on individual modules is supported primarily by Module Leaders and associated module teams. Modules employ a variety of formative assessment styles and feedback mechanisms to support student achievement. This is supplemented for some modules by the Mathematics Support Centre (Sigma) which provides assistance for students seeking further help. Assessments on modules are carried out in compliance with the University Assessment Strategy which has been developed to ensure assessment is fair and equitable for students.

To support work on individual projects during level 3 studies students are assigned a personal project supervisor who will meet with them regularly to provide guidance.

The pastoral support of students is provided primarily through their programme Manager/Course Tutor who also advises on academic progression of students through the programme. Course tutors will refer students to the many other central support services of the University when necessary. This includes support on issues ranging from visa applications for international students through to counselling for students experiencing severe personal problems.

Staff from the Student Support Office are available to support students on all administrative matters. This includes services like providing confirmation of enrolment letters and updating address information and study programmes.

The University strongly believes in providing the latest technologies to assist students with their learning. This includes the CUOnline learning environment and PebblePad for Personal Development Portfolio planning and recording.

Student learning on the programme is supported by the collections of the Lanchester Library, the University's extensive Information Technology resources and the technical laboratories of the Faculty of Engineering and Computing. Students on this programme will make particular use of the following laboratories:

Forensic Computing Laboratory

Multimedia Laboratory

Microprocessor Laboratory

Faculty Open Access Computer Facilities

The University places a high priority on providing Equal Opportunities for all students and has received national recognition for its work in assisting disabled students. Individual staff have been briefed/trained on their responsibilities in these areas and provide the basic assistance required in the academic work of a study module. A Faculty Learning Support Co-ordinator and a central University-wide disabilities office provide more specialised support. Reasonable adjustments can be made to the teaching, learning, assessment and support of the course to maximise accessibility to students with disabilities.

The University has an excellent record on widening access and welcomes students from all backgrounds on to its courses. Applications from mature students and from neighbourhoods with low participation in higher education are encouraged. All modules on the programme may be attended on an associate student or part-time student basis by attending classes timetabled for full-time students.

The Faculty of Engineering and Computing supports students in identifying and acquiring a suitable professional training placement. It also arranges for students to be visited by a professional training tutor to support them during their time in industry.

14 Criteria for Admission

UCAS entry profiles may be found at <http://www.ucas.ac.uk/profiles/index.html>

Candidates for admission to the programme will normally be expected to:

- a) Satisfy the general admission requirements of the University as specified in the Academic Regulations.
- b) Demonstrate a competence to study using the English Language. For international entrants the English language requirement is IELTS grade 6 or equivalent.
- c) Meet the academic entry requirements to the programme by achieving one of the following:
 - 200 UCAS tariff points including two 6-unit subjects which must include Maths or Science or IT or a similar subject.
 - 200 UCAS tariff points with 120 units from a 12-unit Engineering or Information Technology or similar AVCE award.
 - 200 UCAS tariff points from a BTEC National Certificate or Diploma in an appropriate subject.

This section summarises the main admissions criteria for entry to stage 1 of the programme. For international qualifications or direct entry to later stages please contact the admissions office.

15 Method for Evaluating and Enhancing the Quality and Standards of Teaching and Learning

The Programme is managed by the Computing and the Digital Environment Board of Studies of the Faculty of Engineering and Computing.

The Programme Assessment Board (PAB) for Computing and the Digital Environment is responsible for considering the progress of all students and making awards in accordance with both the University and course-specific regulations.

The assurance of the quality of modules is the responsibility of the Boards of Studies which contribute modules to the programme.

External Examiners report annually on the programme and their views are considered as part of the annual quality monitoring process (AQM). Details of the AQM process can be found on the University web site.

Students are represented on the Course Consultative Committee, Board of Studies and Faculty Board, all of which normally meet two or three times per year.

Student views are also sought through module and course evaluation questionnaires.

16 Regulation of Assessment

University policy requires the internal moderation of assessments.

External Examiners are appointed for all named University awards. The role of the External Examiner at module level is to ensure that academic standards are in line with national norms for the subject. External Examiners undertake the moderation of examination papers, and view representative samples of work for the modules for which they have responsibility. At programme level, External Examiners help to ensure fairness in the consideration of student progression and awards. They have the right to comment on all aspects of the assessment system and participate as full members of the assessment boards.

The pass mark for all modules is 40%. This overall module mark may comprise more than one component (e.g. coursework and exam). The individual module descriptors give the precise pass criteria and the

weighting of the component marks that contribute to the overall module mark.

On Undergraduate programmes, the Honours classification boundaries for First Class, Upper Second Class, Lower Second Class and Third Class are 70%, 60%, 50% and 40% respectively.

17 Indicators of Quality and Standards

A team of auditors from the Quality Assurance Agency for Higher Education visited Coventry University from 3 to 7 November 2008 to carry out an institutional audit. The purpose of the audit was to provide public information on the quality of the University's programmes of study and on the academic standards of its awards.

As a result of its investigations, the audit team's view of the University is that: 'confidence can reasonably be placed in the soundness of the institution's present and likely future management of the academic standards of the awards that it offers'; 'confidence can reasonably be placed in the soundness of the institution's present and likely future management of the quality of the learning opportunities available to students'.

The Faculty of Engineering and Computing is a lively place where we set great store by our links with industry, our real-world approach and our commitment to helping all students achieve their maximum potential. Our size allows us to maintain strong areas of specialist expertise and to combine them in innovative, cross-disciplinary courses focused on the needs of industry.

We offer a wide access into higher education, with courses for BSc, BEng and Masters level as well as foundation programmes. Students can specialise in areas that interest and suit them most whilst the Add+Vantage modules allow students flexibility in the study of subjects in a wider context.

Many of our students take a year out in industry and commerce and the faculty provides support for students in industry. In a typical year, over 100 students apply their academic knowledge to real situations whilst on placement. A number of others spend a year developing their language skills, taking advantage of our network of exchange agreements with European universities.

Latest statistics show that within a few months of leaving their courses, almost 90 per cent of our graduates are employed or have gone on to more higher education.

18 Additional Information

Key sources of information about the course and student support can be found:

- In the Student handbook
- On-line on the Programme Web
- On-line on the Faculty Web
- On-line in the Module Information Directory (available via the university web)
- In Study Support information that is available through CUOnline

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided.

More detailed information on the learning outcomes, content, and teaching, learning and assessment methods of each module can be found in the Module Information Directory (MID), student module guide(s) and the course handbook.

The accuracy of the information contained in this document is reviewed by the University and may be verified by the Quality Assurance Agency for Higher Education.

| 19 Mandatory and Option Modules | | | | |
|---------------------------------|---|--------------|----------------------------|--------|
| Module code | Module title | Credit value | Pre/Co requisite | Status |
| Level 1 | | | | |
| 100CDE | Professional Skills 1 | 10 | | M |
| 109SE | Digital Forensics Fundamentals | 20 | | M |
| 110CT | Object Oriented Programming | 20 | | M |
| 120CT | Computer Architecture and Networks | 20 | | M |
| 124MS | Logic and Sets | 20 | | M |
| 160CDE | Software Engineering Fundamentals | 20 | | M |
| | Add+vantage Coventry University | 10 | | M |
| Level 2 | | | | |
| 200CT | Group Project - Computing | 20 | | M |
| 207SE | Operating Systems and Security | 20 | 110CT | M |
| 210CT | Advanced Programming | 20 | 110CT | M |
| 216SE | Security Planning, Incident Response & Disaster Recovery | 20 | 109SE | M |
| 250CT | System Architecture and Networks | 20 | 120CT | M |
| 290CT | Computer Laws and Regulatory Framework of Digital Forensics | 10 | | M |
| | Add+vantage Coventry University | 10 | | M |
| 250EC | Professional Training Module | 40 | | O |
| Level 3 | | | | |
| 303CDE | Individual Project | 20 | | M |
| 307SE | Multimedia Technology | 20 | 120CT | M |
| 318SE | Data Recovery and Advanced Digital Forensic Analysis | 20 | 109SE, 216SE | M |
| 350CT | Systems Security | 20 | (207SE or 210CT) and 124MS | M |
| 360CT | Advanced Network management | 20 | 250CT | M |
| | Add+vantage Coventry University | 10 | | M |

Key

M Mandatory (i.e. must be studied), O Option

| 20 Curriculum Map | | | | | | | | | | | | | | | | | | | | |
|----------------------------|-----------------------------|-----|-----|-----|-----|-----------------------------|-----|-----|-----|-----|------------------|-----|-----|-----|-----|---------------------|-----|-----|-----|-----|
| Intended Learning Outcomes | | | | | | | | | | | | | | | | | | | | |
| Module codes | Knowledge and Understanding | | | | | Cognitive (Thinking) Skills | | | | | Practical Skills | | | | | Transferable Skills | | | | |
| | KU1 | KU2 | KU3 | KU4 | KU5 | CS1 | CS2 | CS3 | CS4 | CS5 | PS1 | PS2 | PS3 | PS4 | PS5 | TS1 | TS2 | TS3 | TS4 | TS5 |
| Level 1 | | | | | | | | | | | | | | | | | | | | |
| 100CDE | | | | | • | | | | • | • | | | | | | • | • | • | • | • |
| 109SE | • | | | | | • | | | | | • | | • | • | • | • | | • | | |
| 110CT | | | • | | | | | • | | | | | | • | • | • | | • | | |
| 120CT | | • | | | | | • | • | | | | • | | | • | • | | • | | |
| 124MS | | | • | • | | | | | | | | | | | | • | | • | | |
| 160CDE | | | • | | | | | • | | | | | | • | • | • | | • | | |
| 1 ACU modules | | | | | | | | | | | | | | | | • | | | • | • |
| Level 2 | | | | | | | | | | | | | | | | | | | | |
| 200CT | | | • | | • | | | • | • | • | | | | | • | • | • | • | • | • |
| 207SE | | | • | | | | | • | | | | | | | • | • | | • | | |
| 210CT | | | • | | | | | • | | | | | | • | • | • | | • | | |
| 216SE | • | | | | | • | | | | | • | | • | • | • | • | | • | | |
| 250CT | | • | | | | | • | • | | | | • | | | • | • | | • | | |
| 290CT | | | | | | | | | | • | | | • | | | • | | | | |
| 1 ACU module | | | | | | | | | • | | | | | | | • | | • | • | • |
| 250EC | • | • | | | | | | | • | | | | | | | • | • | • | • | • |
| Level 3 | | | | | | | | | | | | | | | | | | | | |
| 303CDE | • | | • | | • | | | • | • | • | • | | | • | • | • | | • | • | • |
| 307SE | | | • | | | | | • | | | | | | | • | • | | • | | |
| 318SE | • | | | | | • | | | | | • | | • | • | • | • | | • | | |
| 350CT | | • | | | | | • | | | | | • | | | | • | | • | | |
| 360CT | | • | • | | | | • | | | | | • | | | • | • | | • | | |
| 1 ACU module | | | | | | | | | • | | | | | | | • | | • | • | • |

21 Capabilities (Skills) Map

| Module codes | Learning to Learn | Working with others | Problem Solving and Innovation | Numeracy | IT and Online Learning | Communication | Career Management | Information Management | Personal Development Planning |
|----------------|-------------------|---------------------|--------------------------------|----------|------------------------|---------------|-------------------|------------------------|-------------------------------|
| Level 1 | | | | | | | | | |
| 100CDE | TPA | P | P | | TPA | TPA | TPA | TPA | P |
| 109SE | P | | P | | TPA | PA | | TPA | |
| 110CT | P | | PA | | TPA | PA | | P | |
| 120CT | P | | P | | P | PA | | P | |
| 124MS | P | | PA | TPA | P | PA | | P | |
| 160CDE | P | | P | | P | PA | | P | |
| 1 ACU modules | P | | | | TP | PA | TPA | P | P |
| Level 2 | | | | | | | | | |
| 200CT | TPA | TPA | TPA | P | TPA | TPA | TPA | TPA | P |
| 207SE | P | | PA | | TPA | PA | | P | |
| 210CT | P | | PA | | TPA | PA | | P | |
| 216SE | P | | PA | | TPA | PA | | P | |
| 250CT | P | | P | | TPA | PA | | P | |
| 290CT | P | | P | | TPA | PA | | P | |
| 1 ACU module | P | | | | TP | PA | TPA | P | P |
| 250EC | P | PA | | | P | TPA | P | P | |
| Level 3 | | | | | | | | | |
| 303CDE | P | | TPA | | P | TPA | TPA | TPA | TPA |
| 307SE | P | | PA | | TPA | PA | | P | |
| 318SE | P | | PA | | TPA | PA | | P | |
| 350CT | P | | PA | | TPA | PA | | P | |
| 360CT | P | | PA | | TPA | PA | | P | |
| 1 ACU module | P | | | | TP | PA | TPA | P | P |

Key: T=Taught, P=Practiced, A=Assessed

Capabilities developed through the Add+vantage Scheme

In all full-time UK based undergraduate courses (with the exception of those that lead to a licence to practise), students will undertake at least one 10 credit Add+vantage module in each of the three years of their course. These Add+vantage modules will develop the following generic capabilities:

- Problem Solving Skills
- Action Planning and Organising
- Written and Oral Communication
- Questioning and Listening

Employability competencies and career management skills will be introduced in each Add+vantage module. The following personal qualities related to employability will be addressed in each of the Add+vantage modules:

- Achievement orientation
- Initiative (Creativity)
- Self Confidence
- Decisiveness
- Reflectiveness
- Adaptability/Flexibility
- Influencing
- Career Management Skills

Capability Outlines (from the Code of Practice for Academic and Skills Development)

Learning to Learn - Students should be ready to accept responsibility for their own independent learning. They should also be able to reflect on their learning and appraise their capabilities and achievements. Students should also be able to identify their individual needs for effective learning.

Working with Others - Students should be able to work effectively as part of a group, and respect the dignity, rights and needs of others.

Problem Solving and Innovation - Students should be able to use problem-solving skills in a variety of practical situations. They should be able to demonstrate creativity, flexibility, perception, decisiveness, confidence and an awareness of values.

Numeracy - Students should be able to interpret, analyse and present numerical data.

IT and Online Learning - Students should be able to use computer-based systems for learning, communicating, collaborating with peers and tutors, and working with data.

Communication - Students should be able to communicate effectively in appropriate forms in a wide variety of situations.

Career Management - Students should appreciate the values, culture, structure and process of work organisations relevant to their area of study. Students should also appropriately match their experience and academic achievements to employer expectations.

Information Management - Students should be able to carry out research relevant to their field of study by retrieving and using information drawn from a variety of resources.

Personal Development Planning - Students should be able to demonstrate self-awareness, set personal goals and record achievement.