Programme Specification

BSc Honours Forensic Computing

1. Awarding institution	Middlesex University
2. Teaching institution	Middlesex University
3. Programme accredited by	
4. Final qualification	BSc Honours
5. Programme title	Forensic Computing
6. JACS code	F400/G500
7. Relevant QAA subject benchmark group	Computing
8. Academic Year	2010/2011

9. Reference points

The following reference points were used in designing the programme:

- QAA Computing subject benchmark statement
- QAA Framework for Higher Education Qualifications in England, Wales and Northern Ireland
- QAA/QAAS guidelines for programme specifications
- QAA Code of Practice for the assurance of academic quality and standards in HE
- University's Regulations
- Module Narratives
- British Computer Society (BCS) Guidelines for Exemption and Accreditation
- Middlesex University and School of Computing Science Teaching Learning and Assessment policies and strategies
- University policy on equal opportunities.

10. Aims of the programme

The programme aims to provide graduates with cognitive skills, practical skills and knowledge to be able to pursue careers in computer crime investigations and computer security. All graduates will leave with:

- Generic computing knowledge and skills e.g. computer processes, data storage and representation, basic digital hardware, operating systems, client/server programming, web-based systems.
- Knowledge and understanding of the use of computer technology in criminal activities, and as a tool in forensic investigations.
- Knowledge of the English legal system, legal processes, relevant laws and the regulatory environment related to the handling of digital evidence and forensic investigations.
- Knowledge and skills related to the practice of forensic investigation e.g. handling evidence, analysis and presentation of evidence and working practices related to forensic investigations.

During their final year all graduates are required to demonstrate their cognitive skills, practical skills, self-management skills and knowledge through a one year project accompanied by a dissertation.

11. Programme outcomes - the programme offers opportunities for students to achieve and demonstrate the following learning outcomes

A. Computer-related cognitive abilities On completion of the programme the successful student will be able to: 1. Develop knowledge and understanding of appropriate mathematics, psychology and computer technology (e.g. hardware, software, data modelling, systems design operating systems, encryption, networks) fundamental to forensic computing. 2. Research and present, in writing, rational and reasoned arguments that address a range of information handling situations and examine the impact of new technologies. 3. Explain the functional and operational characteristics of software and hardware components of networks in current use, and Internet infrastructure. 4. Deploy appropriate theory, and a variety of techniques and tools for the detection, investigation, preservation, collection and analysis of digital evidence in forensic investigations. 5. Identify professional issues: Legal (English legal system, applicable law, regulatory frameworks, police code of conduct), ethical, cultural and inappropriate use of computer technology for criminal activities relevant to forensic investigations. 6. Develop knowledge and understanding of how to analyse security requirements for computer systems and prevent computer crime (e.g. implementing security measures). 7. Design, Analyse and implement the development of software using a range of tools and techniques.	**Teaching/learning methods** Acquisition of all learning outcomes occur at all levels and are through a combination of: • Closely supervised laboratories and various exercises. • Encouragement to raise questions and be open minded to suggestions from other team members when seeking solutions to practical solutions. • Supervised Seminars • Open-ended Practicals • Formative and Summative assessment and feedback on assignments. • Lab Experimentation • Lectures • Modelling • Coursework • Online Discussion Boards • Guided and Individual Research • Reading **Assessment** Assessment of all learning outcomes occur at all levels and are through a combination of: • Informal group work during Supervised Tutorials, Seminars or Labs. • Essays • Presentations • On-line quizzes • Coursework • Documentation • Experimentation • Individual and group work • Essays • Lab exercises • Lab tests • Unseen examinations.
B. Computing-related practical abilities On completion of the programme the successful student will be able to: 1. Competent use of digital forensic software to analyse digital evidence and produce reports that justify any conclusions. 2. Competent use of Data Acquisition Software to create and verify images	**Teaching/learning methods** Acquisition of all learning outcomes occur at all levels and are through a combination of: • Closely supervised laboratories and various exercises. • Encouragement to raise questions and be open minded to suggestions from other team members when seeking solutions to practical solutions. • Supervised Seminars

made of digital evidence 3. Apply sound programming principles to the construction and maintenance of software artefacts, from specifications, using appropriate programming paradigm and languages. 4. Deploy appropriate tools to uncover digital evidence in information systems for an investigation. 5. Research and present rational and reasoned arguments that address a range of issues relating to forensic computing.	• Lectures • Informal group work during Supervised Tutorials, Seminars or Labs. • Modelling • Programming • Presentations • On-line quizzes • On-line Discussion Boards • Guided and Individual Research • Formative and Summative assessment and feedback on assignments. • Feedback on Coursework, both formative and summative. • Completing and documenting Lab exercises and experiments • Lab exercises • Feedback from Lab tests • Reading **Assessment** Assessment of all learning outcomes occur at all levels and are through a combination of: • Coursework • Unseen examinations • Practical laboratory tests • Online quizzes • Modelling IS • Programming • Assessing Case Studies • Group Assignments • Writing-up practical laboratory experiments. • Essays • Lab and Seminar Exercises • Lab and Seminar Tests • Use of appropriate software • Open-ended practicals • Project work • Programming • Reading

C. Additional Transferable Skills	Teaching/learning methods
On completion of the programme the successful student will be able to: 1. Demonstrate effective information retrieval skills from appropriate primary research sources, e.g. e-catalogues, and be able to cite and reference such sources. 2. Apply Numerical skills: involving data communications theory and scientific principles relevant to the secure transmission and storage of data. 3. Effectively manage tasks independently and construct a report with appropriate and relevant citations. 4. Prepare for continued professional development and life-long learning in an organisation. 5. Demonstrate communication skills necessary to make effective presentations of a technical nature to a range of audiences, supported by digital evidence. 6. Be aware of the limitations with the practice of Forensic Computing.	Acquisition of learning outcome C2 occurs at levels 1 and 2. Acquisition of learning outcomes C1, C3, C4 and C5 occurs at level 3. Acquisition of learning outcome C6 occurs at levels 2 to 3. Acquisition of all learning outcomes will be through a combination of: • Closely supervised laboratories and various exercises. • Encouragement to raise questions and be open minded to suggestions from other team members when seeking solutions to practical solutions. • Supervised Seminars • Lectures • Informal group work during Supervised Tutorials, Seminars or Labs. • Modelling • Programming • Presentations • On-line quizzes • On-line Discussion Boards • Guided and Individual Research • Formative and Summative assessment and feedback on assignments. • Feedback on Coursework; both formative and summative. • Dissertation; both summative and formative feedback • Completing and documenting Lab exercises and experiments • Lab exercises • Feedback from Lab tests • Suggested Reading **Assessment** Assessment of learning outcome C2 occurs at levels 1 and 2. Assessment of learning outcomes C1, C3, C4 and C5 occurs at level 3. Assessment of learning outcome C6 occurs at levels 2 to 3. Assessment of all learning outcomes will be through a combination of: • Coursework and Project work • Unseen examinations • Practical laboratory tests • Supervised laboratory Exercises • Online quizzes

	• Modelling and Programming • Group Assignments • Writing-up experiments and lab exercises • Essays • Presentations • Lab and Seminar Exercises • Lab and Seminar Tests • Dissertation

12. Programme structure and requirements, levels, modules, credits and qualifications

12. 1 Overall structure of the programme

The programme is studied in four modes:

- Three years full-time; 100% university based
- Four years full-time thick sandwich; after completing years 1 and 2 at university, year 3 is full-time industrial placement then return in fourth year to university. Therefore, 25% industry and 75% university based.
- Four to six years part-time; 100% university based
- Four years full-time with Foundation degree; 100% university based.

The programme is undertaken at levels 1, 2 and 3, where a level is equivalent to one year of full-time study. The delivery of each level is completed over 2 terms; Autumn and Winter. Each level is composed of the delivery of four modules each worth 30 credits, totalling 120 credits for each level and thus giving a grand total of 360 credits for the entire programme.

All modules are compulsory i.e. there are no options.

12.2 Levels and module

Level 1

COMPULSORY[1]	DESIGNATED[2]	OPTIONAL[3]	PROGRESSION REQUIREMENTS

[1] Compulsory modules are those that must be taken, that is, the qualification cannot be awarded unless these modules have been successfully completed. Each of these modules makes a unique contribution to the learning objectives of the programme.

[2] Designated modules are those from which a specified minimum number must be taken, that is, the qualification cannot be awarded unless this specified minimum number of designated modules has been successfully completed. Each of the possible combinations of designated modules will make a similarly unique contribution to the achievement of the learning objectives of the programme.

[3] There are no optional modules for BSc Computing Science (or pathways).

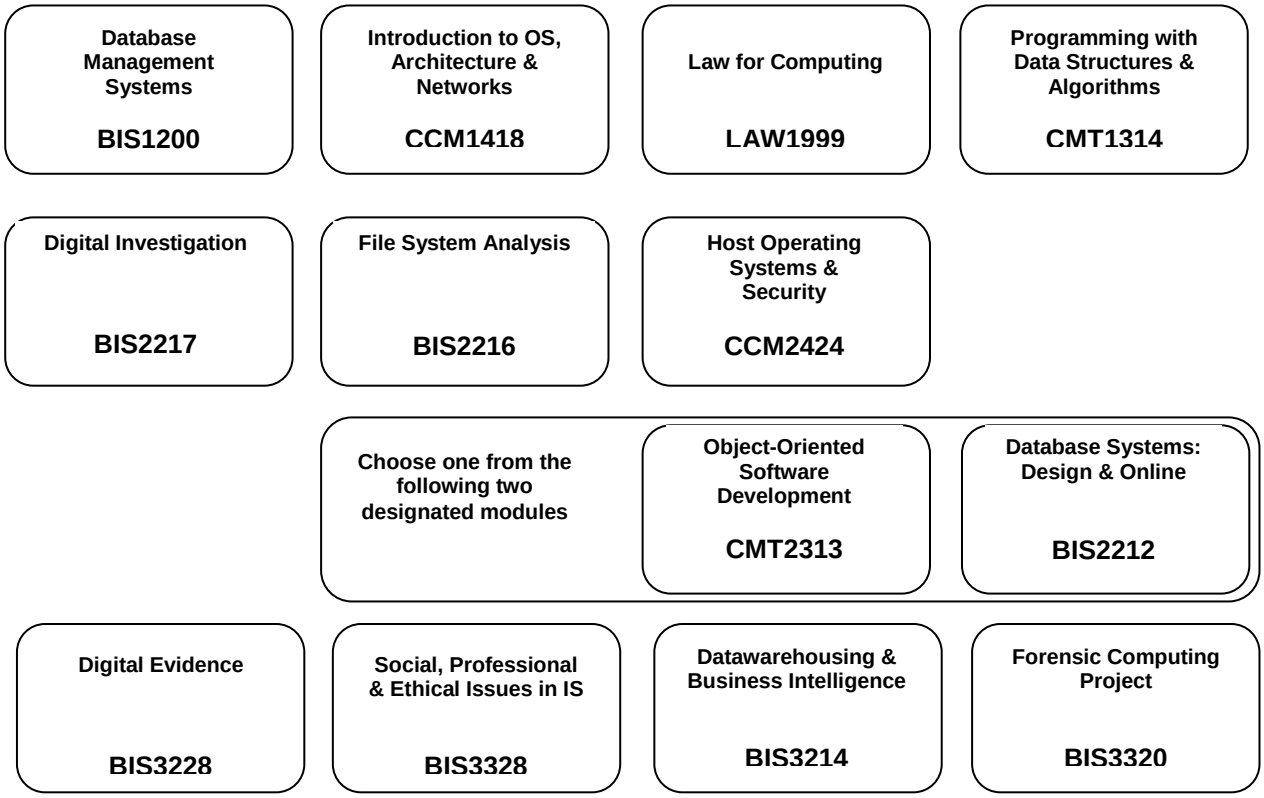
BIS1200 DBMS CCM1418 Introduction to Operating Systems, Architectures & Networks LAW 1999 Law for Computing CMT1314 Programming with Data Structures and Algorithms			To progress to level 2 students are expected to achieve 120 level one credit points

Level 2			
COMPULSORY	DESIGNATED	OPTIONAL	PROGRESSION REQUIREMENTS
CCM2424 Host Operating Systems & Security BIS2216 File System Analysis BIS2217 Digital Investigation	Choose 1 from the following CMT2313 Object-Oriented Software Development BIS2212 Database Systems: Design & Online		To progress to level 3 students are expected to achieve at least 90 level two credit points

Level 3			
COMPULSORY	DESIGNATED	OPTIONAL	PROGRESSION REQUIREMENTS
BIS3214 Datawarehousing and Business Intelligence BIS3228 Digital Evidence BIS3328 Social, Professional & Ethical Issues in IS BIS3320 Forensic Computing Project			Students are expected to achieve 120 credit points at level three to complete their programme and achieve 360 credit points overall. This will qualify students with the award of BSc Forensic Computing.

12.3 Non-compensatable modules. *Modules may additionally be designated non-compensatable.*	
Module level	***Module code***
All modules are subject to University Regulations. CMT1314 is non-compensatable	

12.3 Programme Diagram for BSc (Hons) Forensic Computing



13. A curriculum map relating learning outcomes to modules

Curriculum map for BSc Forensic Computing

The Curriculum map below shows the main measurable learning outcomes of the programme and modules in which they are assessed. The second table provides a key to the referenced programme outcomes (A1, A2, A3 etc.) described in the curriculum map.

Module Title	Module Code by Level	Programme outcomes																	
		A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6
DBMS	BIS1200	✓						✓			✓								
Introduction to Operating Systems, Architectures & Networks	CCM1418	✓		✓											✓				
Law for Computing	LAW1999					✓										✓			
Programming with Data Structures and Algorithms	CMT1314	✓						✓			✓								
Database Systems: Design & Online	*BIS2212*							✓			✓			✓					
Object-Oriented Software Development	*CMT2313*							✓			✓			✓					
Host Operating Systems & Security	CCM2424			✓			✓		✓						✓				
Digital Investigation	BIS2217	✓	✓		✓				✓	✓			✓	✓			✓	✓	✓
File System Analysis	BIS2216	✓	✓		✓		✓		✓	✓		✓	✓	✓		✓		✓	✓
Datawarehousing and Business Intelligence	BIS3214				✓			✓			✓	✓							
Digital Evidence	BIS3228	✓	✓		✓	✓			✓	✓			✓					✓	✓
Social, Professional & Ethical Issues in IS	BIS3328				✓	✓							✓	✓		✓	✓	✓	
Forensic Computing Project	BIS3320		✓										✓	✓	✓	✓		✓	✓

13.1 Programme learning outcomes	
A. Computing-related cognitive abilities	
A1	Develop knowledge and understanding of appropriate mathematics, psychology and computer technology (e.g. hardware, software, data modelling, systems design operating systems, encryption, networks) fundamental to forensic computing.
A2	Research and present, in writing, rational and reasoned arguments that address a range of information handling situations and examine the impact of new technologies.
A3	Explain the functional and operational characteristics of software and hardware components of networks in current use, and Internet infrastructure.
A4	Deploy appropriate theory, and a variety of techniques and tools for the detection, investigation, preservation, collection and analysis of digital evidence in forensic investigations.
A5	Identify professional issues: Legal (English legal system, applicable law, regulatory frameworks, police code of conduct), ethical, cultural and inappropriate use of computer technology for criminal activities relevant to forensic investigations.
A6	Develop knowledge and understanding of how to analyse security requirements for computer systems and prevent computer crime (e.g. implementing security measures).
A7	Design, Analyse and Implement the development of software using a range of tools and techniques.
B. Computing-related practical abilities	
B1	Competent use of digital forensic software to analyse digital evidence and produce reports that justify any conclusions.
B2	Competent use of Data Acquisition Software to create and verify images made of digital evidence
B3	Apply sound programming principles to the construction and maintenance of software artefacts, from specifications, using appropriate programming paradigm and languages.
B4	Deploy appropriate tools to uncover digital evidence in information systems for an investigation.
B5	Research and present rational and reasoned arguments that address a range of issues relating to forensic computing.
Additional transferable skills	
C1	Demonstrate effective information retrieval skills from appropriate primary research sources, e.g. e-catalogues, and be able to cite and reference such sources.
C2	Apply Numerical skills: involving data communications theory and scientific principles relevant to the secure transmission and storage of data.
C3	Effectively manage tasks independently and construct a report with appropriate and relevant citations.
C4	Prepare for continued professional development and life-long learning in an organisation.
C5	Demonstrate communication skills necessary to make effective presentations of a technical nature to a range of audiences, supported by digital evidence.
C6	Be aware of the limitations with the practice of Forensic Computing.

14. Criteria for admission to the programme
Entry requirements are in accordance with the University regulations. We accept students from a range of backgrounds. Most students educated in the UK will have studied A levels, AVCEs or an accredited Access Course. To enter a degree programme you would be expected to have achieved 160-240 UCAS tariff points including a minimum of 120-160 from two 6-unit awards or 60 points, or have successfully completed the Middlesex University School of Computing Science Foundation Year in Computing with Business. All candidates should possess at least grade C in GCSE maths and English language, or equivalent. Mature applicants with relevant work experience are also welcome to apply. You may be credited for part of the course provided you have appropriate prior learning such as a Higher National Diploma or similar. To obtain any qualification you must complete at least one academic year - 6 modules of the programme.

International students who have not been taught in the English medium must show evidence of proven ability in English such as TOEFL grade 550 or IELTS grade 6.0. The University provides pre-sessional English language courses throughout the year for candidates who do not meet the English requirements. For further information, visit the learning resources web site at: www.mdx.ac.uk/language

University policies supporting students with disabilities apply, as described in the University Regulations, 'Information for students with disabilities'.

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 if s/he takes full advantage of the learning opportunities that are provided.