Course Handbook

BSc (Hons) Forensic Computing and Security

2019-20

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School of Physical Sciences & Computing

Please read this Handbook in conjunction with the University's Student Handbook.

Contents

1. Welcome to the course

Welcome to the BSc (Hons) Forensic Computing and Security, which develops the technical and personal skills you need for a career in investigative computing and computer security.

We hope you are looking forward to the challenges the coming year will bring, whether you are a direct entrant or proceeding with us from last year. If you are new, you may find joining a new course can be confusing at first, whether it is your first experience of Higher Education or you are joining the second or third year after having studied elsewhere. Other students may be more familiar with the University's facilities, the course regulations and the staff. There is much for you to find out, so don't be afraid to ask any member of staff or your fellow students.

The University offers many opportunities: not just to learn about computing, but also to engage in a wide range of social or sporting activities, to make new friends and to develop your personal skills, and to work in industry. You will have a great deal of independence, but with this comes responsibility. You must balance your use of time to get the most out of University while making sure that you obtain a qualification that reflects your abilities.

Pay particular attention to the way we expect you to work. This can be summarised simply: come to all classes, hand your work in on time, don't copy from other students, make sure that you properly reference material you find in published literature, and if you have a problem, **ask**.

The next few weeks may be a time of great change, but we hope you will settle down quickly and enjoy your time with us in the School.

1.1 Rationale, aims and learning outcomes of the course

On successful completion of the course, you will be awarded BSc (Hons) in Forensic Computing and Security. The class of your award is calculated from the marks you achieve on the modules you take.

If you leave early or fail to satisfy the criteria for an Honours award, you may be entitled to a lesser award, e.g. Certificate of Higher Education for completing the equivalent of a full-time first year or Diploma of Higher Education for completing the equivalent of two years full-time.

Why study Forensic Computing and Security?

IT makes commerce and industry more efficient and effective, but the same technology also encourages and hides many crimes. As organisations become more dependent on sophisticated computers and communication to support their operation and to store valuable data, they become more vulnerable to IT-based attacks and need more protection from those attacks. Moreover, the Internet crosses international boundaries and provides greater access to computer systems, making it easier to commit crimes but more difficult to identify and prosecute offenders. The way a virulent program can attack computers throughout the world within minutes of its release illustrates the malicious use of the Internet.

Forensic investigation is the use of scientific methods for the preservation, collection, analysis, interpretation, and presentation of digital evidence to reconstruct or anticipate crimes or abuse of company policies. Forensic computing uses sophisticated tools and procedures to preserve and investigate IT-based evidence and ensure the validity of its interpretation. Computer security involves protecting computer systems from being subject to an attack through technology driven techniques, and by ensuring the user is using that technology in the correct manner.

In the past, documentary evidence was held on paper and usually was easily read by anyone interested. Most information is now stored on digital media. Digital evidence has played a prominent part in many recent cases, such as the US anti-trust suit against

Microsoft, which used email evidence, and the Hutton Inquiry where evidence stored on a PDA (Personal Digital Assistant) was discussed. Digital evidence is essential to the investigation of abusive images and misuse of Internet chat rooms. Computer forensics deals with finding, extracting and explaining digital evidence. The same skills can be used to recover lost information or passwords.

Given the growth in the use of computers and communication systems, the demand for people with forensic investigation skills is likely to increase. The UK government have invested £1.9 billion in a cyber security strategy and identified a 20 years skill gap.

What is special about BSc (Hons) Forensic Computing and Security?

This course develops the varied skills required of the Forensic Investigator and Computer Security Analysts but also provides a good foundation for a range of careers in computing. Identifying and interpreting digital information becomes more difficult as the complexity of the technology increases. The graduate must

1. be able to develop an understanding of the relevant technology before drawing conclusions from the evidence.
2. use appropriate methodologies and tools to ensure that the evidence is thoroughly investigated and will be accepted in court
3. be able to solve problems and communicate effectively
4. be aware of the relevant legal issues

Broad Technical Expertise

This course develops an understanding of the concepts underlying a wide range of technology:

- Design of software and data structures, which provides the necessary conceptual foundation for the understanding of complex threats and methods of concealment of information.
- Hardware operation: to provide an appreciation of IT system components and their interaction.
- Operating system capabilities, operation and internal structures: to help find latent information.
- Data communications, network management, threats and counter-measures.
- Information systems and databases: to help in the investigation of potentially compromised software.
- Cryptography and steganography (hiding information in innocent files).
- Internet applications and scripting.
- Threats to security and countermeasures.

Knowledge of Appropriate Methodologies

A good analyst must understand and apply techniques needed to examine, analyse and present evidence that will be accepted in court. For example, cross validation using multiple tools and techniques is standard in all forensic sciences.

Graduates require the ability to interpret and apply published guidelines. Where the appropriate procedure is unclear, they must apply their professional judgement, which may ultimately be tested in court.

Competence with Tools

The graduate must understand techniques that apply irrespective of the particular tools. The good investigator must be able to evaluate tools and to carry out such tasks as

- Disk imaging

- Viewing files in a variety of formats
- Searching for data, such as IP addresses and host names, network routes, images and other information, in raw disk blocks
- Monitoring network traffic and system logs, to reconstruct user activity
- Recovering passwords
- Recover "deleted" files and examine unallocated file space
- Use security tools such as firewalls and appreciate their role within a system security
- Analyse security incidents and determine their most suitable solutions

Problem-solving skills

The identification of relevant evidence and the reconstruction of a series of events require a high level of creative problem-solving, initiative and persistence.

Communication Skills

The forensic analysis of computer systems, whether to track down a crime or a breach of company policy, has the same goal: the production of persuasive conclusions based on factual evidence

Computer evidence is intangible and there may be a considerable gap between the raw data and the conclusion, which must be explained to a non-technical audience.

A good investigator will present an investigation and analysis in neutral terms with a clear separation between facts and opinion. Good documentation of procedures and outcomes is essential for success in computer crime cases. Without this, evidence may be subject to question and the competence of the investigator may be challenged if the investigation was done haphazardly.

Graduates will work with a number of different stakeholders and must be able to communicate effectively. Not only considering the legal and ethical issues, but expressing them to others to ensure an ethical approach to the analysis of evidence, for example a network intrusion.

Legal Awareness

The graduate must be able to understand the legal issues relating to

- Admissibility of computer evidence
- Privacy and permissions to search
- Computer Misuse
- Interception of network based communications

The investigator need not be a legal expert, but must know when to seek expert advice.

Attitudes

The forensic investigator or security analyst is in a position of trust and must have an ethical attitude consistent with the role and responsibility of an independent professional.

Forensic or security analysis demands a patient and methodical approach to all aspects of the work.

During the investigation and the presentation of the results, the investigator must maintain impartiality in the search for truth.

Although confident in their ability, graduates must understand their own limitations and know when to consult specialists in particular areas of computing.

Developing any computer system is a creative activity, which solves problems using appropriate technology. It requires many skills and abilities, relating to hardware, software and people. These skills include the analysis, design, and implementation of software, hardware, and data communication technology, the use of a variety of tools and the ability to communicate with a wide range of people, such as users and clients involved with the analysis of a problem, and the designers and programmers who implement the solution. Developers must be able to learn quickly to cope with the rapidly developing technology. The skills developed on your Forensic Computing and Security course will be applicable to many computing careers.

Important skills for any career

At the University of Central Lancashire, we are concerned with the development of technical abilities and skills in all our Computing students, but we also want to develop your abilities for logical thought, independent learning, teamwork, ethical practice and communication. These capabilities will be important whatever your career.

To help you adapt to the inevitable changes and developments in technology during your career, the course considers underlying theory and potential new developments as well as current practice and techniques.

Will I find a career in Forensic Computing or Security when I graduate?

There has been significant growth in the importance of Digital Forensic Investigation and Computer Security. However, these industries are highly competitive and careers are highly sought after and many students will seek careers in related areas. To be successful you will have to develop a very high level of technical and personal skills. You should consider undertaking a placement (see the Computing Handbook for Degree Students) to give you additional experience when you are looking for a career.

The graduates of this course may seek employment as

- Forensic investigators and consultants, including careers in the Police,
- Security consultants,
- IT system management,
- Network administrators,
- Data recovery experts.

Typical activities of a graduate might include:

Following the detection of an incident, the analyst is presented with an IT system and an indication of potential problems. The analysis will go through the following stages:

1. Determination of an appropriate approach based on the technology involved and the potential problems.
2. Preservation of the evidence: taking a complete copy of disks, and preventing people from using the device. Because evidence may be hidden in areas such as the swap file that may be destroyed if the operating system runs, the disks should be copied without running the normal operating system.
3. Examination: an in-depth, systematic search for evidence relating to the suspected problem. This focuses on identifying and locating potential evidence, possibly within unconventional locations such as deallocated disk space and the creation of detailed documentation for analysis.
4. Analysis: creative thinking to determine the significance of the evidence, to reconstruct, based on fragments of data, the sequence of actions that occurred and to draw conclusions based on evidence found. This process often proceeds by the generation of a hypothesis based on the current evidence, followed by further examination to find

evidence to confirm or disprove the hypothesis. The examination and analysis stages may be repeated many times to produce a confirmed theory.

5. Presentation of a summary and provide explanation of the conclusions of the investigation written in a way that can be understood by a layperson.

The expertise of the forensic investigator is similar to that required by information security professionals in managing corporate IT resources, protecting servers and computers, and tracking intruders on their networks. Computer forensic tools and procedures can identify computer security weaknesses that could lead to the loss of sensitive computer data.

The analysis becomes more complicated if a networked system is involved rather than a single computer. In this situation, evidence will be gathered from not only the compromised computer but also from distant firewalls, routers, other computers, and intrusion detection systems.

What other careers are open to me when I graduate?

Although your chosen course will reflect your current interests and strengths, you should not constrain your career goals because of your course: many companies that employ computing graduates will provide specialist training for particular jobs therefore there are a wide range of related job opportunities with skills gained from this course. You may find work as in technical support; you may proceed to research or further study; or you may prefer to work in sales or customer support.

Of course, computing also provides a useful background for many other careers that do not have subject-specific entry requirements.

What is the purpose of the course?

The emphasis is on the development of vocational skills and the underpinning theory of forensic computing, computer security and related computing subjects to enable graduates to obtain excellent career opportunities within the industry. In particular the course emphasises the understanding of computing technology; the development of skills in digital investigation and computer security, and the development of skills in software development using appropriate tools. The course is intended to produce creative graduates with a broad range of basic skills, the ability to enhance their own expertise as the technology and computer-based crime develops.

The course will:

- develop the skills and understanding of theory necessary for you to be employed in a Computing environment
- encourage and enable you to become an independent learner.
- develop critical evaluation, communication, enterprise and self-management skills.
- produce graduates with the skills and confidence to solve problems independently and as part of a team
- provide an opportunity for you to develop transferable skills and enhance subject-specific expertise by undertaking a work placement
- enable students to apply their hardware and software skills to combating threats to computer security.
- foster a systematic approach to the preservation, extraction and analysis of covert information from an IT system.
- develop a critical attitude to legal and ethical issues relating to forensic computing

What will I be able to do by the end of the course?

What we expect you to be able to do is defined by the course learning outcomes, which are detailed in the programme specification (See Appendix 8.1).

In summary, on completion of the course you will be able to:

1. Explain, evaluate and apply techniques and methods to solve a range of computing problems
2. Evaluate and apply project management tools and techniques
3. Evaluate procedures for handling computer-based evidence
4. Explain potential threats to computer systems and networks and evaluate appropriate countermeasures.
5. Apply legal and ethical concepts to the analysis of IT-related problem situations.
6. Compare features of operating systems
7. Solve technical and human problems relating to the development and use of IT-based systems
8. Perform and document a digital forensic analysis using computer and network tools.
9. Communicate the findings of a forensic analysis in written and verbal form.
10. Analyse a computer-based system and propose appropriate security measures.
11. Develop software using appropriate tools

You should also have the intellectual skills expected of a graduate and the inter-personal skills required for a successful career.

Each module has specific learning outcomes, which contribute to the overall course learning outcomes.

1.2 Course Team

Key members of your course team are John Dempsey (jpdempsey@uclan.ac.uk) your Course Leader, Lesley May (lmay@uclan.ac.uk) the First Year Tutor, and Nicky Danino (ndanino@uclan.ac.uk) the Project Tutor.

Each module will be led by a module tutor, who plans the module and sets the assessment. See Section 2 for a list of modules and the current module tutors. Module tutors may change from one year to the next. When you do your project, you will be allocated a project supervisor, who will help you manage your project.

Chris Casey (ccasey@uclan.ac.uk) is the Computing Academic Lead, responsible for the overall quality of all Computing courses and should be contacted if there are problems that can't be resolved by the module tutor or course leader.

1.3 Expertise of staff

You will be taught by staff with a wide variety of industrial and research backgrounds. They have substantial experience of teaching at this level. The School has researchers working in a range of computing-related areas. Research into Human-computer interaction is important, particularly through the Child-Computer Interaction group (CHICI). There is research into data communications and networks, mobile computing, computer security and software engineering, particularly Agile software development. We have collaborated with Sony, BAE and a variety of UK and overseas Universities.

Staff industrial experience includes working in the games industry, the defence industry and the telecommunications industry, as software or database developers. The School is involved in consultancy and develops software for clients.

1.4 Academic Advisor

You will be assigned an Academic Advisor who will provide additional academic support during the year. They will be the first point of call for many of the questions that you might

have during the year. Your Academic Advisor will be able to help you with personal development, including developing skills in self-awareness, reflection and action planning.

In the first year, your Academic Advisor will normally be someone who teaches you so you can speak informally during or after classes, but they will also be available in their office at times they will publish on their office door. You can contact them quickly by email.

In the second and later years, your Academic Advisor will normally be your Course Leader, who has specialist knowledge about your course and the opportunities it offers.

If you have a problem contacting your Academic Advisor or Course Leader, for example, because they are off sick, ask the Administrative Hub for advice.

1.5 Administration details

Campus Admin Services provides academic administration support for students and staff and are located in the following hub which opens from 8.45am until 5.15pm Monday to Thursday and until 4.00pm on Fridays. The hub can provide general assistance and advice regarding specific processes such as extenuating circumstances, extensions and appeals.

Computing and Technology Hub
C&T Building Room 235
Contact Details: candthub@uclan.ac.uk or +44 (0)1772 891994

1.6 Communication

Outside of taught classes, we will normally communicate with you by email and by E-Learn. The University expects you to use your UCLan email address and check regularly for messages from staff. If you send us email messages from other addresses they risk being filtered out as potential spam and discarded unread.

If you want, you can set up rules to redirect emails to your personal email address. If you send us email messages from other addresses, they risk being filtered out as potential spam and discarded unread.

Staff will try to reply to emails within 24 hours during the working week. However, they may take longer during busy periods or if they are away from the University. Time-critical issues should be raised with your course leader or academic lead if you don't get a response in a reasonable time.

1.7 External Examiner

The University has appointed an External Examiner for your course to help to ensure that the standards of your course are comparable to those provided at other higher education institutions in the UK. If you wish to contact your External Examiner, do this through your Course Leader and not directly. External Examiner reports are available through the Computing Student Noticeboard, which you can access through Elearn Blackboard.

Every module has an External Examiner, who reviews examination papers and coursework briefs set by a module tutor and internally verified by another tutor.

The external examiners moderate a sample of student work after it has been marked and internally moderated by the course tutors. The sample includes work awarded marks from the different classes, that is, Fail (<40), Third (40-49%), Lower Second (50-59%), Upper Second (60-69%), First (70+%). The moderators check that the standards are appropriate and that the work has been marked consistently.

Professor Haifa Takruri-Rizk of the University of Salford is the External Examiner who takes overall responsibility for checking the quality of the course, particularly for assessments and the way they are marked on the key modules. Other examiners have responsibility for other modules

2. Structure of the course

2.1 Overall structure

For a full-time 3 year Honours Degree, you will take 18 modules, six in each of 3 years for a full-time student. Part-time students will study no more than 4 modules per year. If you have previous study at an appropriate level, you may be entitled to exemptions. Each module has a level rating, ranging from 4-6, roughly corresponding to years 1-3 of your Degree. If you are enrolled on a foundation entry year, you will study an additional 6 modules to prepare you for the first year of the 3 year Honours Degree.

To obtain an Honours Degree, you must pass 18 modules at level 4 or above, with at least 12 at level 5 or 6, including at least 5 at level 6. The double module project will provide two of the level 6 modules. Some students will start with a Foundation year. This consists of 6 modules that prepare you for the first year of the Honours programme. Two thirds of these are technical modules. The other modules help you to develop the skills you need to succeed in Higher Education and to provide a broader education, which will be very useful in your future career.

You will normally study in Preston, but you may have the opportunity to study the course at our Cyprus campus or to undertake equivalent modules with a University abroad. Discuss these possibilities with your course leader or the first year tutor.

It is a good idea to take a year out in industry – a placement – between your second and final year. This is optional, but will give you valuable work experience that will make you stand out when you are looking for a career. During your second year, we will provide help and advice on seeking a placement, but we cannot guarantee you a suitable placement. As you will be treated as a normal paid employee, you will have to apply for and undergo the normal company admissions process to obtain a placement. Placements can be anywhere in the UK or even abroad.

2.2 Modules available

Each module is a self-contained block of learning with defined aims, learning outcomes and assessment. A standard module is worth 20 credits. It equates to the learning activity expected from one sixth of a full-time undergraduate year. Modules may be developed as half or double modules with credit allocated up to a maximum of 120 credits per module. The course structure has three strands: technical, course-specific, and project management. The technical strand develops general computing skills that are relevant to forensic computing and security but also widens your career opportunities. The course-specific strand looks at forensic investigation, computer security and legal issues. The project management strand develops communication skills, provides experience in applying appropriate techniques to team and individual projects, and illustrates the importance of legal, social, ethical and commercial issues.

Foundation Year

Most students will go directly into the first year. However, if you are taking the foundation year, you will study six modules at level 3. Three of these will develop general academic skills, which will help you to become an effective University student. Three will develop technical and personal skills more directly related to computing.

[Note: the module tutor may change from one year to the next.]

Code	Module Title	Credits
COC001	Introduction to Software Development	20
COC002	Investigating IT	20
COC003	Problem-solving for Computing	20
COC004	Study Skills 1 – Learning How to Learn	20
COC005	Study Skills 2 – Developing Academic Skills	20
COC006	Introduction to Mathematical Methods	20

At the end of the foundation year and at the end of stage one, you can remain on your current course or choose another. We will discuss the options available in the second semester of the foundation year.

The First Stage

In the first stage you will study modules designed to introduce you to fundamental concepts such as computer hardware, programming, software development and new developments in computing. In the first year, you will study the following modules:

[Note: the module tutor may change from one year to the next.]

Code	Module Title	Credits
CO1111	Computing Challenge	20
CO1507	Introduction to Networking	20
CO1401	Programming	10
CO1404	Introduction to Programming	10
CO1605	Systems Analysis and Database Design	20
CO1706	Interactive Applications	20
CO1508	Computer Systems and Security	20

Why are the first year modules important?

The first year is a ‘common first year’ and is shared with the majority of courses in Computing (with the exception of Computer Games Development and Software Engineering who do a module about ‘Games Concepts’). While the Computer Systems and Security module may look like the most important module for the Forensic Computing and Security degree, it is really important to understand that anyone wishing to have a career in the forensic or security industry have as much ‘computing knowledge’ as possible. You won’t do any investigative computing in the first year (e.g. investigating criminal activity), but you will start to develop the skills necessary to be able to perform investigations.

The Computing Challenge introduces teamwork and presentation skills, which help you to work on projects and to present the results of investigations.

Introduction to Networking, Systems Analysis and Database Design, and Interactive Applications, discuss networking, database technology, web applications and user interfaces, which will help you to protect and investigate modern distributed systems.

Computer programming is central to Computing and all digital evidence and security vulnerabilities are created by computer programs. Even if you aren't involved in the development of complex software, your knowledge of computer programming will help you to understand how digital evidence is created, and how security vulnerabilities are taken advantage of. You may use your programming skills to develop scripts which automate tasks, to analyse malware, or to create your own forensic investigation triage tools.

The Second Stage

In the second stage you will take four key forensic modules: Digital Evidence and Incident Response, Digital Forensic Tools and Standards, Computer Security and Mobile Device Evidence and Investigation. You will develop your ability to understand complex computer software and widen your career options by studying Advanced Programming or Database Systems. You will increase your understanding of the underlying technology by studying Communications and Networks and enhance your management skills in The Agile Professional, where you will undertake a forensic-related team project.

Code	Title	Credits
CO2403	The Agile Professional	20
CO2508	Computer Security	20
CO2517	Digital Evidence and Incident Response	20
CO2520	Digital Forensic Tools and Standards	20
CO2518	Mobile Device Evidence and Investigation	20
	One of	
CO2402	Advanced Programming	20
CO2516	Network Management	20
CO2701	Database Systems	20

The Placement Year

You will take this for a Sandwich award, which gives you industrial experience that will help you in your final stage and make it easier to find a job when you graduate. Placements maybe available both overseas and in the UK (there is additional information in the Computing Handbook for Degree Students)

Code	Title	Credits	Status
CO2802	Industrial Placement Year	120	Optional

The industrial placement year is awarded a notional 120 credits, but these credits are not counted towards your final degree classification.

The Third Stage

Digital Forensic Investigation and Penetration Testing are the key final year modules. It is supported by the legal issues covered in Computers, Society and Law. The project management strand culminates in the project, which although individually assessed, may involve interaction with other students, from this or other courses.

It is **your responsibility** to ensure that you have registered an appropriate module from the options' list. This can be used to broaden your understanding of computing technology, to develop your understanding of how IT is used in business, or to develop research skills, either because you are interested in a further degree, or because you realise the importance of research in the rapidly changing IT environment.

To reflect the importance placed on the project in the final stage, it is a double module.

Code	Title	Credits
CO3505	Digital Forensic Investigation	20
CO3603	Computers, Society and Law	20
CO3517	Penetration Testing	20
CO3808	Double Project	40
	One of	
CO3514	Network Design	20
CO3701	Wireless and Mobile Networks	20
CO3812	Science Communication	20
CO2714	Internet Application Development	20
CO2519	Internet of Things	20
CO2702	Human Computer Interaction	20

2.3 Course requirements

As a student hoping to become a computing professional, you should uphold the Code of Conduct of the BCS, the Institute for IT, which is the professional body for IT. We encourage you to join the BCS as a Student Member.

2.4 Module Registration Options

Discussions about your progression on the course normally take place in February each year. It is an opportunity for you to plan your study over the next academic year. The course team will tell you about the various modules / combinations available and you will both agree on the most appropriate (and legal) course of study for you.

After the first year of any of our computing Honours Degree courses, it is possible to transfer to another computing Honours course. For most courses, you won't need to do any extra work, but if you are transferring from or to BSc (Hons) Computer Games Programming or BSc (Hons) Software Engineering you may need to do some extra work to ensure that the change is appropriate.

2.5 Study Time

2.5.1 Weekly timetable

A timetable will be available once you have enrolled on the programme, through the student portal.

2.5.2 Expected hours of study

We expect you to study for 10 hours per each credit taken (i.e. 200 hours for a 20 credit module) – this includes attendance at timetabled classes, assessment and time spent in private study. It means roughly 36 hours per week, most of which is in your own time. In lectures, the lecturer presents and explains concepts. In practicals, you will usually use worksheets to guide you through computer-based work. Tutorials are often based on worksheets and small or whole group discussion.

Most first year modules in Computing involve 3 hours of class contact, a one-hour lecture and two hours of tutorial or practical. You will normally have about 17 hours per week of class contact in year 1. You should work for at least that long outside of class, giving a working week of 36 hours on average.

Most second and third year modules have a lecture and either one or two hours of tutorials or practical classes. You should work for around twice that long outside of class as part of your working week of 36 hours.

In your own time, you will have assignments and directed work from practicals or tutorials as well as reading and adding to your notes from the lectures. However, you are expected to find and read other relevant information for yourself. Computing is a very practical subject and there is always more practical work that you can do to develop your skills.

2.5.3 Attendance Requirements

You are required to attend all timetabled learning activities for each module. Notification of illness must be made to CandTHubAttendance@uclan.ac.uk.

Exceptional requests for leave of absence must be made to Lesley May (lmay@uclan.ac.uk) for first year students or to your Course Leader for other students.

We will monitor your attendance. It is your responsibility to make sure your attendance is recorded. You can check your attendance record through myUCLan. Occasional absences are not a problem, but you should discuss your attendance with the module tutor if your attendance is not recorded for more than one event that you attend.

You must only enter your own details on the attendance system. To enter information for anyone else is dishonest and would result in inaccurate records, which might mean that a student's problems might not be detected until it is too late for us to help. Any student who makes false entries can be disciplined under the student guide to regulations.

International students may have responsibilities under the UK Visas and Immigration (UKVI), Points Based System (PBS) - you MUST attend your course of study regularly; under PBS, UCLan is obliged to tell UKVI if you withdraw from a course, defer or suspend your studies, or if you fail to attend the course regularly.

If you have not gained authorisation for absence, do not respond to communications from the University and are absent for four weeks or more, you may be deemed to have withdrawn from the course. If so, the date of withdrawal will be recorded as the last day of attendance.

3. Approaches to teaching and learning

3.1 Learning and teaching methods

The course offers you a mixture of lectures, tutorials and practical classes to help you learn. These are supported by material on Elearn Blackboard, our online virtual learning environment. You will need to supplement the classes with reading and practical work in your own time. Each of the methods can be very effective if you make proper use of them:

Lectures

These provide a lot of information to a large group in a short time. In most cases, notes will be provided on Elearn Blackboard. However, they are not a substitute for making your own notes. You don't need to copy down everything the lecturer says. The idea is to understand the main points and to write down what you need to remind you of them later. Don't be afraid to exchange notes with a friend or to experiment with only taking brief notes. Do try to relate the topics covered in a lecture to those covered earlier in this module or in others. Lecturers often provide notes, possibly through the Web. It is useful to have these before the lecture, so that you can add your own notes alongside. If you don’t understand something, don’t be afraid to ask. Your question may reflect problems that many of your colleagues are having. The lecturer will have limited time to answer questions in detail, but will be happy to clarify points that many students find difficult. Some questions may have to wait until after the lecture. You can always contact your module tutor by email, but there may also be a discussion board on Elearn Blackboard.

Tutorials and Seminars
These involve smaller groups to allow you to participate more actively. Do so. You can also use this opportunity to get help with your own specific problems.

Practical Classes and Laboratories
These give you the chance to practise practical skills under supervision. It is usually possible to get a copy of the practical sheet from Elearn Blackboard before the class. If you know what is required, you can make better use of the member of staff present. If you are stuck, do ask, but make a serious attempt to solve the problem yourself and show your lecturer your work to give them some idea of where you're up to. You can be fairly sure you're not the only one finding the exercise difficult. If the task were straightforward, we'd not be giving it lab time. You may have to spend time outside of the class to complete the exercise. Remember that the purpose of the exercise is not simply to follow the instructions like a recipe: you need to understand and learn from what you have done.

3.2 Study skills
WISER (http://www.uclan.ac.uk/students/study/wiser/index.php) provides support on how to take notes, to write essays and to do exams, which can make a big difference to your confidence and ultimately to your final Degree classification. You will be surprised at how few students don't bother to take advantage of the full range of support that is offered.

In your first year, we will help you to develop your study skills during induction, and in other first year modules such as CO1111, Computing Challenge.

One key skill is time management. University life is very busy during term time. Some people find the difference between college or school and University very difficult indeed. Juggling your time to attend lectures, seminars and labs, working on assignments and private study, and finding time for part-time work, plus all the other social activities that make university life so much fun; demands excellent time management skills.

Time management is probably one of the most difficult lessons you will have to learn. The workload does not become any less as your course progresses. You should develop skills to manage your workload for yourself. Here are a few tips that may be useful:

- Make a start on each assignment as soon as you receive it. You may have several weeks to complete it, but if you delay starting it, you will discover that deadlines creep up and you have too much to do, or you will concentrate on one piece of work to the exclusion of others. An assignment may look impossibly large, but a little work every day will soon have it done.
- Work in the library or labs when you have no timetabled classes: this way you get your assignments finished and make effective use of your time.
- If an assessment requires group working, co-operation is needed. If you work best late at night and the rest of your group are 'morning people' you will almost certainly have communication problems and possibly time management problems as well. Learning to compromise and being flexible is an essential part of successfully working in groups.

What do the course team expect of me?
We expect you to attend all classes and to do significant additional work outside of classes. Working consistently will help you understand the material and make assignments easier.

You will be expected to adopt a responsible attitude towards the quality of work that you produce and the deadlines you are set. **Keeping to deadlines and completing your assignments on time is an important part of the course. If you fail to keep to deadlines you will be penalised.**

Most day-to-day communication will take place through University e-mail. Read your e-mail regularly, at least once per day – not having seen a notice is no excuse for missing something important. You may wish to set up a rule to forward university e-mails to your home e-mail address automatically to ensure you have all this information.

If you have problems, please discuss them as early as possible with the relevant staff to try to resolve them.

You must inform the Hub

- if you change your address, so that we can contact you when necessary
- if you are absent for more than a couple of days through illness or other reason.

3.3 Learning resources

3.3.1 Learning Information Services (LIS)

During induction, you will learn about the resources provided by LIS (https://www.uclan.ac.uk/students/study/library/). Learning how to find and evaluate information is a skill that will benefit you throughout your career.

Books

Although these contain lots of information, it can be difficult to learn from a book unless you approach it properly. A textbook is not a novel - it doesn't have to be read from cover to cover. You need only read and understand the bits that are relevant to you. Therefore, before investing much time in a book, you should know what you want to get from it. This may mean skipping through the book and looking for key sentences and section headings. Use the Contents list and the Index.

There are a number of methods for 'reading with understanding'. You may not want to apply the methods rigorously, but they do contain some good ideas. A typical method is SQ3R:

Survey	- scan quickly through the book to see what it contains
Question	- jot down the questions you hope the book will answer (i.e. what you want to know)
Read	- read the parts of the book which answer your questions
Recall	- close the book and see if you can answer the questions
Review	- review the relevant sections of the book.

Journals

These contain articles written by researchers or practitioners. They tend to be more up to date than books, but also more complex and difficult to understand. You will make more use of these during the second and third year, but that shouldn't stop you following up topics that interest you in journals. You can find journals in the library, but most students use the Internet to find published articles.

3.3.2 Electronic Resources

LIS provide access to a huge range of electronic resources – e-journals and databases, e-books, images and texts. See http://www.uclan.ac.uk/students/library/online_resources.php for more information. You should make use of the Discovery search engine (http://www.uclan.ac.uk/students/library/discovery_resource.php).

All modules will be supported by information on Elearn and you should make sure that you make use of this outside as well as in class.

Elearn Blackboard

This is our on-line learning environment, which contains

- Teaching material: outline lecture notes, tutorial and practical exercises and links to further reading
- Assessments: coursework, tests and on-line examinations
- Discussion groups: an opportunity for you to exchange views with other students and teaching staff

The Internet

This is a key source of information, which can give you access to books, journal articles and other material. It is important that you learn how to use Search Engines such as Google (www.google.com) to help you find **relevant** information. Remember that, unlike journal articles, which are reviewed by other experts, anyone can publish on the Internet – don't assume that everything you find is correct. Whichever source you use, you must ensure that you **DO NOT PLAGIARISE** someone else's work. In essence, this means making sure that say where you have got your ideas from: we use the Harvard Convention for References.

3.4 Personal development planning

Personal development planning is about assessing your own skills and abilities and planning how to develop them during (and after) your course. Technical development is part of this, but personal skills such as teamwork and communication skills are also important to your success at University and in your career. Employers put a great emphasis on these aspects.

3.5 Preparing for your career

CO2403, The Agile Professional is designed in collaboration with Careers to help you stand out from other graduates

The Careers advisory service (Careers) offers a range of support for you including:-

- career and employability advice and guidance appointments
- support to find work placements, internships, voluntary opportunities, part-time employment and live projects
- workshops, seminars, modules, certificates and events to develop your skills
- a daily drop in service from 09:00-17:00 for CV checks and initial careers information.

For more information, visit the careers team in Foster Building, or access our careers and employability resources via the Student Portal.

4. Student Support

If you have problems relating to a specific module, contact the relevant module tutor

For more general problems, as well as your academic advisor (see below) you can also discuss problems with John Dempsey (jpdempsey@uclan.ac.uk), your Course Leader, and in the first year, Lesley May (lmay@uclan.ac.uk), who is the First Year Tutor.

Chris Casey (ccasey@uclan.ac.uk) is the Computing Academic Lead, and should be contacted if there are problems that can't be resolved by the module tutor or course leader.

The 'i' Student Information Centre offers information and support on a wide range of issues.

4.1 Academic Advisors

Your Academic Advisor is an academic member of staff who will discuss your progress with you and help you to deal with problems. In the first year, your Academic Advisor will teach you so you will have the opportunity to speak to them informally. They will arrange to see you formally several times during the year. You can contact them by email to arrange a private meeting.

4.2 Students with disabilities

If you have a disability that may affect your studies, please either contact the Disability Advisory Service - disability@uclan.ac.uk - or let one of the course team know as soon as possible. With your agreement, information will be passed on to the Disability Advisory Service, who will work with the School to help you study. We will make reasonable adjustments to accommodate your needs and to provide appropriate support for you to complete your study successfully. This can include special arrangements for assessments, such as a personal examination plan. Where necessary, you will be asked for evidence to help identify appropriate adjustments.

Chris Casey (ccasey@uclan.ac.uk) is the acting disability co-ordinator for students with disabilities in the School. Please contact him directly for further advice / support, particularly if you have not been allocated a Disability Advisor. He is not a specialist disability advisor but can help to ensure that appropriate arrangements have been put into practice.

4.3 Students' Union

The Students' Union offers thousands of volunteering opportunities ranging from representative to other leadership roles. We also advertise paid work and employ student staff on a variety of roles. You can find out more information on our website: http://www.uclansu.co.uk/

5. Assessment

5.1 Assessment Strategy

Given the practical and vocational nature of computing courses, there is an emphasis on practical assessment. You will sit examinations, but you will also be assessed on the sort of tasks you might have to perform in industry including communication skills and team work. As a result, your progress will be monitored in a variety of ways.

All modules have some coursework assessment. This may take the form of a report or program to write, a system to analyse or design, or a presentation to give. We usually expect you to document the program, justify design decisions and evaluate the quality of the program. You should read the assessment criteria in the assignment specification carefully. No matter how wonderful your work seems to you, you won't do well unless you make sure you satisfy these criteria. We assess your work considering industry standards and professional norms. If you work to our criteria, you will learn how to become an effective, respected computing professional.

In course assessment doesn't just assess what you can do – by doing the assessment you will learn and consolidate the skills you have. Your tutors will give you formal feedback on assignments to help you to do better on other assessments, but more importantly for your future career, to show how you can improve your performance on similar tasks in the future. By acting on the feedback from the lecturer, you will develop your competence and understanding.

You will also get a lot of informal feedback on your performance in class, particularly during practical classes.

Many modules have an examination at the end. Some of these examinations may be "open-book" examinations where you are allowed to take notes and/or books into the examination. Others are more traditional examinations, although some of these may be based around a case study that is issued before the examination.

The overall mark for each module is calculated as a weighted average of the coursework and examination marks. The details are given in the module descriptor held on Elearn Blackboard.

5.2 Notification of assignments and examination arrangements

How do I know what assignments I will have?

At the beginning of the year you will be issued with an indicative assignment schedule. Also at the start of each module, the module leader will tell you the latest date by which a piece of coursework will be released and the date by which you must submit it. This is to help you to plan your work. Examinations will be displayed on your on-line timetable.

How do I submit my assignments?

Assignments are usually submitted on-line through Elearn Blackboard, which gives you an electronic receipt. Keep a copy of it safe. *To reduce problems from lost assignments, keep a **complete** copy of the work you hand in.*

As far as possible your work will be marked anonymously, so assignment work submissions must not contain your name.

Aim to complete the coursework before the hand-in date to allow a margin of safety in case of technical problems. The University provides you with the software and hardware relevant to your course. If you choose to use your own equipment you are responsible for backing it up. Therefore please note that **failed/lost computers; failed/lost hard-drives, etc will not be accepted as an excuse for late submission**.

Meeting deadlines and dealing with problems in good time are essential parts of your preparation for industry. If you have a problem that may make it difficult to meet a deadline, discuss it with the relevant lecturer **before** the deadline if possible.

If you fail to submit a piece of work without a good reason, you will be given 0% for that work. This will make passing the module very difficult and may mean that you have extra work to complete over the summer. **It makes sense to hand work in before the deadline, even if it is incomplete.**

Will I be penalised for late work?

Except where an extension of the hand-in deadline date has been approved (using extenuating circumstances forms), lateness penalties will be applied in accordance with University policy as follows:

(Working) Days Late	Penalty
1 - 5	maximum mark that can be achieved is 40%
more than 5	0% awarded

5.3 Referencing

In your assignments, use Harvard convention for referencing whenever you make a reference to someone else's work. You can find lots of information about this on the internet (e.g. https://v3.pebblepad.co.uk/v3portfolio/uclan/Asset/View/Gm3mmGk6sM3RgHZnjGfh7mm6pM), but you will be given more information about it during your course. If you are in any doubt, ask a lecturer for guidance.

5.4 Confidential material

If you use personal or commercially confidential information in your assignments (e.g. in your project), you have ethical and legal responsibilities to respect confidentiality and maintain the anonymity of individuals and organisations in your work assignments.

Students who do projects for clients must arrange for a client project agreement to be signed by the participants to ensure that they all understand their responsibilities.

5.5 Cheating, plagiarism, collusion or re-presentation

Please refer to the information included in section 6.6 of the University Student Handbook for full definitions. The University uses an online Assessment Tool called Turnitin. A pseudo-Turnitin assignment will be set up using the School space on Elearn Blackboard to allow students to check as many drafts as the system allows before their final submission to the 'official' Turnitin assignment. Students are required to self-submit their own assignment on Turnitin and will be given access to the Originality Reports arising from each submission. In operating Turnitin, Schools must take steps to ensure that the University's requirement for all summative assessment to be marked anonymously is not undermined and therefore Turnitin reports should either be anonymised or considered separately from marking. Turnitin may also be used to assist with plagiarism detection and collusion, where there is suspicion about individual piece(s) of work.

6. Classification of Awards

The University publishes the principles underpinning the way in which awards and results are decided in Academic Regulations. Decisions about the overall classification of awards are made by Assessment Boards through the application of the academic and relevant course regulations.

7. Student Feedback

You can play an important part in the process of improving the quality of this course through the feedback you give. For example, we made significant changes to the Foundation Entry Year after the first year of operation because of feedback from students indicated that study-skills modules would be better if they were more computing-oriented. A new maths module and two computing-based study skills modules were introduced.

7.1 Student Staff Liaison Committee meetings (SSLCs)

The purpose of a SSLC meeting is to provide the opportunity for course representatives to feedback to staff about the course, the overall student experience and to inform developments which will improve future courses. These meetings are normally scheduled once per semester. Details of the Protocol for the operation of SSLCs is included in section 8.2 of the University Student Handbook. SSLC meetings are scheduled and chaired by the School President and administered by CAS.

Do not simply save up problems to be raised at the meeting. To help resolve them quickly, problems should be raised with relevant staff, your course representative, or support staff as soon as you are aware of them.

8. Appendices

8.1 Programme Specification(s)

UNIVERSITY OF CENTRAL LANCASHIRE

Programme Specification

This Programme 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 he/she takes full advantage of the learning opportunities that are provided.

Sources of information on the programme can be found in Section 17

1. Awarding Institution / Body	University of Central Lancashire
2. Teaching Institution and Location of Delivery	University of Central Lancashire Preston
3. University School/Centre	Physical Sciences and Computing
4. External Accreditation	BCS, the Institute for IT
5. Title of Final Award	BSc (Hons) Forensic Computing and Security
6. Modes of Attendance offered	Full-time Part-time Sandwich (additional year)
7a) UCAS Code	
7b) JACS Code	I100
8. Relevant Subject Benchmarking Group(s)	Computing
9. Other external influences	BCS, the Institute for IT
10. Date of production/revision of this form	**April 2017**
11. Aims of the Programme	
Forensic Computing involves the collection, analysis, interpretation, and presentation of digital evidence to reconstruct or anticipate crimes or abuse of company policies. It is complementary to computer security, which protects computer systems and their users from crime and loss. The forensic computer analyst uses systematic methods and sophisticated tools to preserve and investigate IT-based evidence and ensure the validity of its interpretation.	

The analyst requires technical expertise, an understanding of computer-related crime, an appreciation of relevant law, a methodical approach to investigation, and the ability to explain complex technical ideas to laypeople.
This course develops the specialist skills required to work as a forensic analyst or computer security analyst alongside general computing skills required for other careers in computing.

Common Computing Aims

- To develop the skills and understanding of theory necessary for the graduates to be employed in a Computing environment
- To encourage and enable students to become independent learners.
- To develop critical evaluation, communication, enterprise and self-management skills.
- To produce graduates with the skills and confidence to solve problems independently and as part of a team
- To provide an opportunity for students to develop transferable skills and enhance subject-specific expertise by undertaking a work placement

Specific Aims

- To enable students to apply their hardware and software skills to combating threats to computer security.
- To foster a systematic approach to the preservation, extraction and analysis of covert information from an IT system.
- To develop a critical attitude to legal and ethical issues relating to forensic computing

12. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

The successful student will be able to
A1. Explain, evaluate and apply techniques and methods to solve a range of computing problems
A2. Evaluate and apply project management tools and techniques
A3. Evaluate procedures for handling computer-based evidence
A4. Explain potential threats to computer systems and networks and evaluate appropriate countermeasures.
A5. Apply legal and ethical concepts to the analysis of IT-related problem situations.
A6. Compare features of operating systems

Teaching and Learning Methods

Acquisition of knowledge is mainly supported through lectures and directed learning. The role of directed learning increases as the course progresses. Understanding is reinforced through practical, tutorial and seminar work. This may involve a series of small exercises, extended case studies or discussions. Drop-in help sessions are provided to support particular areas.

Assessment methods

Informal and formative feedback is provided in tutorial, seminar and practical classes through class discussion and individual advice. Formal assessment is through practical and written coursework, and time-constrained examinations, which may include on-line multiple-choice exams, traditional examinations, open-book examinations and partially-seen questions.

B. Subject-specific skills

The successful student will be able to
B1. Solve technical and human problems relating to the development and use of IT-based systems.
B2. Perform and document a digital forensic analysis using investigation tools.
B3. Communicate the findings of a forensic or security analysis in written and verbal form.
B4. Analyse a computer-based system and propose appropriate security measures.
B5. Develop software using appropriate tools

Teaching and Learning Methods

Computing is a highly practical subject. Skills are developed in a co-ordinated and progressive manner during the three years of the programme. At level 4, the focus is on the acquisition of basic skills through laboratory exercises. At higher levels, more specialist equipment is used. Some practical work demonstrates advanced techniques, while extended practical work enables students to exercise creativity and develop their own solutions. Lectures, sometimes involving on-line

demonstration, are supported by tutorials, seminars, practical exercises and directed work.

Assessment methods

A variety of methods are used to assess technical and personal practical skills. These include laboratory exercises, oral presentations, formal reports, and implementation exercises with supporting documentation demonstrating a professional approach and evaluating methods and products.

C. Thinking Skills

The successful student will be able to
C1. Investigate complex situations thoroughly and impartially
C2. Locate, evaluate and integrate information from multiple sources
C3. Evaluate ideas, methods and systems
C4. Analyse and solve problems

Teaching and Learning Methods

Intellectual skills are developed through practical work, tutorial and seminar work and coursework assignments. Discussion among students and with staff during tutorials and supervisory meetings are key methods for the development of thinking skills. Problem-solving is developed in practical classes, seminars and tutorials. Throughout the course, students practise problem-solving individually and in groups. Students research, apply and evaluate information during the Agile Professional module and during the problem-solving project.

Assessment methods

Staff in class and in supervisory meetings provide informal formative feedback. Intellectual skills are partly assessed through formal examinations but assessment of coursework and practical and theoretical project work is the main vehicle for assessment of the higher order skills. A variety of assessment methods are used, including formal reports, essays, and oral poster presentations.

D. Other skills relevant to employability and personal development

The successful student will be able to
D1. Communicate effectively with clients, users, technicians, investigators and developers
D2. Learn and work independently and as part of a team
D3. Operate within an ethical and legal framework appropriate to computing professionals.
D4. Plan, perform, manage and report on a relevant project
D5. Identify and set personal goals relevant to long-term educational and career planning

Teaching and Learning Methods

The development of essential communication and transferable skills begins in the Computing Challenge module at the start of the first year. It is continued in the Computer Systems and Security module at level 4, alongside the introduction and discussion of relevant legal and ethical topics. Communication skills and legal and ethical understanding are further developed in The Agile Professional module at level 5 and in context in other modules through tutorial/seminar work and coursework assignments.
Relevant notations to support technical communication are introduced through tutorial and practical work using appropriate tools.
Teamwork skills are developed through practical experience during induction exercises and are reinforced throughout year 1, and in a technical team exercise during induction at the start of year 2. It culminates in the course-specific team project in semester 2 of the Agile Professional module, which requires the students to work in a team to solve a technical problem.
Whilst professional and ethical issues are addressed as appropriate in all modules, at each level there is a module designed to tackle professional and ethical issues. Concepts introduced in year 1 Computer Systems and Security are developed in year 2 Agile Professional and applied in the third year Project. These modules offer students a framework to use with issues they will meet in computer-related situations. Such issues are referenced by staff (when appropriate) within all aspects of the teaching. One of the main advantages to having specific modules to focus on these topics is that students begin to become mindful about matters in computing that they have not formerly contemplated, and are then able to apply the newly found professional approach in the other modules on the course.
A major individual project, supported by supervisory meetings, reinforces and extends the student's abilities: they research topics relevant to their project, summarise and evaluate their findings in a literature review, plan and monitor their progress, solve problems and write reports.

Formative assessment during induction week starts the development of the student's ability to identify strengths and weaknesses and to set and work toward personal goals. This is continued during the Computing Challenge and subsequent level 4 modules, where students are encouraged to evaluate themselves and to consider career options. The year 2 Agile Professional module has talks by past placement students and companies to help students assess the benefit of undertaking an industrial placement. In both year 1 and year 2, feedback on assignments is discussed holistically by year tutors to help the students interpret the guidance and translate it into personal action.

This course has benefitted from sharing a programme of visiting speakers with students from the School of Forensic and Applied Sciences. Students also have the opportunity to undergo expert witness training.

Assessment methods

These skills are assessed through written coursework in many modules, but particularly the Agile Professional team project and the Honours individual projects, where students write an academic article and a project report, are interviewed, and give a poster presentation.

13. Programme Structures*				14. Awards and Credits*
Level	**Module Code**	**Module Title**	**Credit rating**	
Level 6	CO3505 CO3517 CO3603 CO3808 CO3514 CO3701 CO3812 CO2714 CO2519 CO2702	Digital Forensic Investigation Penetration Testing Computers, Society and Law Double Project **One from:** Wireless and Mobile Networks Advanced Database Systems Science Communication Internet Application Development Interacting with the Internet of Things Human Computer Interaction and User Experience	20 20 20 40 20 20 20 20 20 20	**Bachelor Honours Degree** Requires 360 credits including a minimum of 220 at Level 5 or above (excluding CO2802) and 100 at Level 6 **Bachelor Degree** Requires 320 credits including a minimum of 200 at Level 5 or above (excluding CO2802) and 60 at Level 6
Level 5	CO2802	Industrial Placement Year	120	Sandwich route requires successful completion of CO2802 which has a notional credit rating of 120 credits, in addition to the above requirements.
Level 5	CO2403 CO2508 CO2517 CO2520 CO2518 CO2402 CO2701 CO2516 CO2802	The Agile Professional Computer Security Digital Evidence and Incident Response Digital Forensic Tools and Standards Mobile Device Evidence and Investigation **One from:** Advanced Programming Database Systems Network Management Industrial Placement Year	20 20 20 20 20 20 20 20 120	**HE Diploma** Requires 240 credits including a minimum of 100 at Level 5 or above
Level 4	CO1111 CO1401 CO1404 CO1507 CO1508 CO1605 CO1706	The Computing Challenge Programming Introduction to Programming Introduction to Networking Computer Systems and Security Systems Analysis and Database Design Interactive Applications	20 10 10 20 20 20 20	**HE Certificate in Computing** Requires 120 credits at Level 4 or above
Level 3*	COC001 COC002 COC003 COC004	Introduction to Software Development Investigating IT Problem-solving for Computing Study Skills 1 – Learning How to Learn	20 20 20 20	Students who exit after successful completion of 120 credits at Level 3 will receive a transcript of the modules and grades

	COC005 COC006	Study Skills 2 – Developing Academic Skills Introduction to Mathematical Methods	20 20	

*** Only taken by Foundation Year Entry students**

15. Personal Development Planning

Students are introduced to Personal Development Planning (PDP) during induction at the start of the first year. Following an introductory lecture, students conduct PDP activities with their personal tutors. Students' assessments of their own skills are used to guide team selection for the team challenge provided by The Computing Challenge module. Further work is done in during the following 4 weeks of this module through meetings with the first year tutorial team. Students are encouraged to audit their skills; set goals and produce a Progress Plan. In a progression meeting students consider matching their skills to their target Degree course.

At the start of the second year, students are told about the benefits of undertaking a placement and the work needed to find one. There are presentations by returning placement students. Other PDP activities involve meetings with their course leader. These sessions help students to identify their skills, use the feedback they have received on assessment performance, consider their long-term goals and identify the personal development necessary to succeed on the course and find relevant employment. Students also develop a CV and are involved in other employability activities during the Agile Professional Module.

At the start of the third year, students are reminded of the support provided by the careers service and undertake activities to ensure they have started thinking about their future career or future studies.

Academic advisors are a key point of contact for students and ensure they take advantage of the available opportunities. They help students review the experiences and skills they gain while at university. They guide students to sources of help and advice where required. Problems identified by academic staff are followed up very quickly by academic advisors, who can help the students to identify issues and decide appropriate actions.

16. Admissions criteria *
(including agreed tariffs for entry with advanced standing)
**Correct as at date of approval. For latest information, please consult the University's website.*

For entry at Level 4 (Bachelor Degree), applicants must have

112 UCAS tariff points at A2 or BTEC National Diploma (Distinction Merit Merit)
AND
5 GCSEs at grade C or above including Maths and English or equivalent.

For entry at Level 3 (Foundation Entry), applicants must have

80 UCAS tariff points at A2 or BTEC National Diploma (Merit, Merit, Pass)
AND
5 GCSEs at grade C or above including Maths and English or equivalent.

Students whose first language is not English must achieve an IELTS 6.0 (with no component score less than 5.)

Qualifications equivalent to the above are accepted.

17. Key sources of information about the programme
• **Department Web Site (www.uclan.ac.uk/computing)**
• **Course Fact Sheets**

18. Curriculum Skills Map - BSc (Hons) Forensic Computing

Please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

Level	Module Code	Module Title	Core (C), Compulsory (COMP) or Option (O)	Programme Learning Outcomes																					
				Knowledge and understanding						Subject-specific Skills						Thinking Skills					Other skills relevant to employability and personal development				
				A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5		C1	C2	C3	C4		D1	D2	D3	D4	D5
LEVEL 6	CO3505	Digital Forensic Investigation	COMP	✓		✓	✓	✓	✓		✓	✓				✓		✓	✓				✓		
	CO3603	Computers, Society and Law	COMP			✓		✓		✓						✓		✓	✓				✓		
	CO3517	Penetration Testing	COMP	✓			✓	✓				✓	✓			✓		✓	✓				✓		
	CO3808	Double Project	C	✓	✓	✓		✓		✓	✓	✓				✓	✓	✓	✓		✓	✓	✓	✓	✓
	CO3514	Wireless & Mobile Networks	O	✓			✓			✓	✓		✓					✓	✓						
	CO3701	Advanced Database Systems	O	✓		✓	✓			✓			✓	✓		✓		✓	✓		✓				
	CO3812	Communication Science	O																						
LEVEL 5	CO2403	Agile Professional	COMP	✓	✓			✓		✓		✓					✓	✓	✓		✓	✓	✓	✓	✓
	CO2518	Mobile Device Investigation	COMP	✓		✓		✓	✓	✓	✓	✓				✓	✓		✓				✓		
	CO2508	Computer Security	COMP	✓			✓		✓	✓	✓		✓						✓						
	CO2517	Digital Evidence and Incident Response	COMP	✓		✓	✓		✓		✓					✓			✓						
	CO2520	Digital Forensic Tools and Standards	COMP	✓		✓		✓	✓		✓	✓				✓	✓	✓	✓		✓		✓		
	CO2714	Internet Application Development	O	✓			✓		✓	✓			✓	✓				✓	✓						
	CO2701	Database Systems	O	✓						✓				✓					✓						
	CO2702	Human Computer Interaction and User Experience	O	✓				✓		✓				✓		✓		✓	✓		✓		✓		
	CO2802	Industrial Placement Year	O	✓	✓					✓									✓		✓	✓	✓	✓	✓
	CO2516	Network Management	O	✓	✓		✓	✓	✓	✓			✓			✓			✓						
	CO2402	Advanced Programming	O	✓						✓				✓					✓						

	CO2519	Interacting with the Internet of Things	O	✓			✓		✓	✓			✓	✓		✓		✓	✓						
LEVEL 4	CO1401	Programming	COMP	✓						✓				✓					✓						
	CO1404	Introduction to Programming	COMP	✓						✓				✓					✓						
	CO1507	Introduction to Networking	COMP	✓			✓	✓	✓	✓			✓						✓						
	CO1111	The Computing Challenge	COMP	✓			✓	✓	✓	✓	✓		✓	✓					✓						
	CO1605	Sys Analysis and Database Design	COMP	✓						✓				✓		✓			✓						
	CO1706	Interactive Applications	COMP	✓						✓				✓					✓						
	CO1508	Computer Systems and Security	COMP	✓			✓		✓				✓						✓				✓		

19. LEARNING OUTCOMES FOR EXIT AWARDS:

Typical learning outcomes for the award of: BSc Forensic Computing and Security

A1. Explain, evaluate and apply techniques and methods to solve a range of computing problems
A2. Evaluate and apply project management tools and techniques
A3. Evaluate procedures for handling computer-based evidence
A4. Explain potential threats to computer systems and networks and evaluate appropriate countermeasures.
A5. Apply legal and ethical concepts to the analysis of IT-related problem situations.
A6. Compare features of operating systems
B1. Solve technical and human problems relating to the development and use of IT-based systems.
B2. Perform and document a digital forensic analysis using investigation tools.
B3. Communicate the findings of a forensic or security analysis in written and verbal form.
B4. Analyse a computer-based system and propose appropriate security.
B5. Develop software using appropriate tools
C1. Investigate complex situations thoroughly and impartially
C2. Locate, evaluate and integrate information from multiple sources
C3. Evaluate ideas, methods and systems
C4. Analyse and solve problems
D1. Communicate effectively with clients, users, technicians, investigators and developers
D2. Learn and work independently and as part of a team
D3. Operate within an ethical and legal framework appropriate to computing professionals.
D5. Identify and set personal goals relevant to long-term educational and career planning

Typical learning outcomes for the award of: Diploma of Higher Education in Forensic Computing and Security

A1. Explain, evaluate and apply techniques and methods to solve a range of computing problems
A2. Evaluate procedures for handling computer-based evidence
A3. Explain potential threats to computer systems and networks and evaluate appropriate countermeasures.
A4. Apply legal and ethical concepts to the analysis of IT-related problem situations.
A5. Compare features of operating systems
B1. Communicate the findings of a forensic or security analysis in written and verbal form.
B2. Analyse a computer-based system and propose appropriate security.
B3. Develop software using appropriate tools
C1. Investigate complex situations thoroughly and impartially
C2. Locate, evaluate and integrate information from multiple sources
C3. Analyse and solve problems
D1. Communicate effectively with clients, users, technicians, investigators and developers
D2. Learn and work independently and as part of a team
D3. Operate within an ethical and legal framework appropriate to computing professionals.
D4. Identify and set personal goals relevant to long-term educational and career planning

Typical learning outcomes for the award of: Certificate of Higher Education in Computing

A1. Explain and apply techniques and methods to solve a range of computing problems
A2. Describe key features of operating systems and networked IT systems.
B1. Design and implement simple software with an appropriate user interface
B2. Analyse an IT system and propose appropriate security considering legal and ethical issues.
C1. Analyse and solve problems
C2. Locate and use relevant information
D1. Communicate with clients, users and developers, using simple techniques
D2. Work independently and as part of a team

8.2 Succeeding at Assessment

There are guidelines for succeeding at assessments. Those who are unaware of these or who decide to ignore them will be at a disadvantage.

a) Do what you are asked to

When an assignment or examination question is set, the lecturer will have a good idea of what is necessary to answer it properly. You will normally be asked to do several tasks and be given guidance on the relative worth of each. Read carefully what is required and attempt every part but do not spend too much time on components of little worth.

b) Think of the person who will evaluate your work

Ensure that your work is well-organised and easy to mark. Don't use fancy folders that take five minutes to undo. Be concise and stick to the point. Try to demonstrate that even if you haven't time to complete the assignment tasks you do understand what is required.

c) Pace yourself

Equipment and staff are always harder to find as deadlines approach. You will save yourself time and effort if you start assignments early and don't let them pile up. If you leave work until the last minute, it will be hurried and will contain silly errors. Use an assessment timetable to plan and monitor your work - and complain to a lecturer who is late in giving out assignments!

d) Obey the rules

Read the assessment regulations carefully. Ensure that something is handed in on time. Even if you haven’t managed to spend sufficient time on a piece of work or if you feel that you have misunderstood what is required, your attempt may show the lecturer where you need help.

e) Be sensible

Make sure you have done the preparatory work before you tackle relevant parts of the assignment. There are likely to be practicals on relevant material: do them. If you find them difficult or don’t understand them, discuss them with the relevant tutor.

If an assignment seems very difficult or to require a very long time, discuss it with the lecturer to make sure you understand what is required.

f) Prepare properly for examinations

Everyone worries before exams, it’s natural – a combination of a fear of the unknown and concern over the consequence of failure. However, you can increase your confidence by preparing properly.

1. **Use past papers** – they are available in each module’s page on the University’s Elearn Blackboard learning environment. Sometimes very similar questions will appear on your examination. At least they will give you a good idea of what the lecturer expects. The best use of past examination questions is to provide a focus for your revision. It may be useful to refer to them during the year as topics are covered.

2. **Keep up during the year** – revision does not mean "learning from scratch". Try to review your lecture notes at the end of each week and highlight any areas you don't understand. Find out about these immediately.

3. **Make a revision timetable** – allocate each subject roughly a fair share of time and try to stick to it. Don't make it too ambitious - you will need time to go out and relax. Joint revision with a few friends can be more pleasant, but beware of believing they understand the material any better than you do.

4. **Tackle the examination sensibly** – don't panic: if you are finding it difficult, so are other people. Make sure you have all the relevant equipment. Read the paper carefully, especially the "rubric" that specifies the number of questions you must answer and any restrictions on them. Plan to use the available time appropriately: allow equal time if the questions are allocated equal marks. Make sure you attempt and hand-in the full number of questions required, even if you think your answer to one question is poor. It's much easier to convert 0/20 to 5/20 than it is to convert 15/20 to 20/20.

5. **Choose your questions carefully** and ensure that you answer the question that is set, not the one you wish had been set.

6. **Present your answers thoughtfully** – make them easy to mark. Write clearly, but don't waste time on excessive neatness, for example, cross out rather than using liquid paper. Aim at quality not quantity. Don't try to save paper.

7. If you are running out of time, **use notes to show how you would have answered the question.**

8. **If your mind goes completely blank, move to another question**, or try to think of related topics or try to picture the relevant lecture notes.

9. **Don't waste time on post-mortems after the examination.**

10. **Be aware of hints given by lecturers** - the lecturer may indicate whether a particular subject is important (i.e. likely to appear on the examination) or what you are expected to know about a subject.

11. **Find out the consequences of failure** - normally if the worst comes to the worst and you fail an examination, you will be given a chance to resit another examination in that module at a later date

8.3 Coping With Difficulties

Will I be able to cope with the course?

We have a lot of experience of teaching computing to people from all sorts of backgrounds. Support is designed into the course for those who need it. For example, there are support sessions for Maths and Programming and you are encouraged to take advantage of these if necessary. Lecturers publish times when you can speak to them about your progress or discuss problems that you are having.

We have accepted you on this course because we believe you have the potential to succeed. Of course, to realise that potential, you must remain well motivated and work steadily throughout the year. Remember that you should do about 200 hours of work per module.

What if I have a disability

If you have a disability that may affect your studies, please let one of the course team know as soon as possible. We will make reasonable adjustments to accommodate your needs and to provide appropriate support for you to complete your study successfully. Where necessary, you will be asked for evidence to help identify appropriate adjustments.

What if my part-time work is interfering with my course?

Everyone is aware that many students have to work to support themselves, but you must decide whether the extra money is worth any risk to your studies. Work of 8-10 hours a week is unlikely to cause significant problems, providing that you are well organised. Much longer hours on a regular basis may affect your chance of success. If you have major financial problems, you should seek expert advice, possibly starting with the Students' Union or the "i". In the long term, it may be better to switch to a part-time route, to give you more time to work.

I am a part-time student, what if work interferes with my studies?

Make sure that you don't take too many modules. You can take up to four modules in a year, but four modules is a heavy workload on top of a full-time job. A smaller number of modules per year over a longer period may lead to a better degree. If you provide evidence that work is particularly intense, we may be able to arrange extensions to coursework.

What if I have problems?

If you have a problem with a particular piece of equipment or with installing software, ask a technician or LIS Customer support (01772 895355, or internal extension x5355, email LISCustomerSupport@uclan.ac.uk or in person in the Library) for help.

If you encounter problems with an assignment, seek help from the relevant lecturer. Discussing the problem with your friends may help, but make sure that any work handed in for an assignment is really your own. **Copying someone else's work is cheating and such cases are treated very seriously.** In the unlikely event that you cannot do the coursework even with advice from the lecturer, your notes and the library, hand in whatever you have done and then learn from the lecturer's comments.

There are many sources of help and support for general problems (e.g. your Academic Advisor or The "i" in Foster Building). Talk to someone: the relevant lecturer if it is a problem with a particular module, or your Course Leader or Academic Advisor if it is of a more general nature. Student Services have specially trained counsellors who can give advice on a wide range of personal problems. The sooner we are aware of the problem, the sooner we can help or advise you on the options available to you.

If there are circumstances beyond your control that affect your performance, tell the Module Leader as soon as possible. If a short extension or other action is appropriate, you should get documentary evidence and submit it in a special "Extenuating Circumstances"

envelope obtainable from the School Office. Where appropriate, we will take action during the year to alleviate genuine and significant extenuating circumstances. At the end of the year the Assessment Board will take these circumstances into account where appropriate. Deadlines for submitting extenuating circumstances are listed on the back of the envelope.

What if it all goes wrong?

To pass a year, full-time students must pass or be condoned in 6 modules. If, after resits, you don't manage to do this, you may be able to take the failed modules as a part-time student, or to repeat the year as a full-time student. Obviously, these options have financial implications, so you should discuss them with your family and other relevant people e.g. the Student Union Advisory Service or the University Academic Advisor.

Getting Help and Advice

Your lecturers will be able to help you with problems in their subject. Each lecturer is available for consultation. Their availability may be displayed outside the lecturer's office, or as part of their email signature). Do not be afraid to use this time.

Teaching staff will help you with software relating to their modules in practical classes. Staff in the library can provide additional information about the available software on the main computers. They can help you with problems you may have in using the computers. If you have technical problems with machines in the School, please email liscustomersupport@uclan.ac.uk with the following information

Room Number

Equipment Number e.g. 4738 or other identifier if no equipment number

Brief description of the fault

If the fault has affected your coursework, include a copy of the email in the coursework submission.

Other students will often help you with minor problems and can be a great help if used sensibly. They may be able to explain concepts or help with non-assessed practical work. However, don't assume that a student who sounds knowledgeable really does know better than you and do not copy assessed work. The work you hand in for assignments must be your own unless the assignment asks for group work. If other students are experiencing similar problems, you or your **Student Representative** should gather information and discuss it with the relevant lecturer. If problems persist, the first year tutor or, if the problems are serious, the Head of School may be able to sort them out.

Your academic advisor, course leader, or year tutor (year 1) are a good source of advice. The <i> and the Student Union Advice Centre have a lot of experience of helping students tackle a wide range of problems.