



Course Handbook
MComp (Hons) Computer Networks 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.

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Contents

- 1 Welcome to the Course**
- 2 Structure of the Course**
- 3 Approaches to teaching and learning**
- 4 Student Support**
- 5 Assessment**
- 6 Classification of Awards**
- 7 Student Feedback**
- 8 Appendices**
 - 8.1 Programme Specification(s)**
 - 8.2 Succeeding at Assessment**
 - 8.3 Coping With Difficulties**

1. Welcome to the course

MComp (Hons) Computer Networks and Security explores the fascinating area of data communications that makes your mobile phone, social media and the Internet possible, but also the incredibly important task of keeping such communication safe and secure from agents who wish to take advantage of it. We will help you develop a range of practical skills and understanding of the theory that will prepare you for an interesting and rewarding career.

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 please do not 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, do not 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



Since the development of robust large-scale local area and wide area networks and in particular, the advent of the World Wide Web in the early 1990s the use of network technology and the internet has dramatically increased. It follows that the range of applications and potential careers for graduates in the discipline has also rapidly increased. One of the key areas of growth in terms of employment is in the security industry. Major incidents, such as the ransomware attack against the NHS, highlight the need for skilled security staff who can identify and deal with an ever-changing risk environment.

The MComp (Hons) Computer Networks and Security is vocational in nature as evidenced by the fact that it embeds a vocational recognised qualification (Cisco CCNA) alongside the academic rigour of an honours degree. You will be able to arrange the examination for Cisco CCNA at any Cisco test centre. We have deliberately kept the CCNA examination separate from the examination of your modules to ensure your degree assessment is appropriate for an honours degree.

Wireless Networks are now a key part of most business and home networks. This has significant implications for supporting the huge range of wireless hardware, including mobile phones, tablets, laptops and IoT devices. The course considers the hardware, topology, user interfacing and security issues that have arisen out of this development.

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. In addition, you will practice communicating with non-technical managers in order to raise security issues in an effective way, allowing them to make appropriate decisions about security budgets etc. Developers must be able to learn quickly to cope with the rapidly developing technology. The skills developed on your Computer Networks and Security course will be applicable to many computing careers.

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 computer networking or security when I graduate?

The networks industry has experienced significant growth, and there is little doubt that the general trend is upwards. However, the networks industry is highly competitive and careers in network technology are highly sought after. To be successful you will have to develop a very high level of technical and personal skills. You should consider undertaking a placement to give you additional experience when you are looking for a career. You should make sure that you build up a portfolio of security skills, network designs, and Cisco elements accomplished to demonstrate your capabilities.

Typical activities of network computing specialist include

1. Networks pre-sales, topology design / configuration
2. Cyber security manager
3. Network sales project management
4. Penetration tester
5. Network sales technical implementation support
6. Network troubleshooting
7. Network engineer
8. Network Manager (topology implementation; maintenance; administration; tuning; security)
9. Network product design / development
10. Application development for network environments (wired / wireless)
11. E-commerce implementation

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 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 network technology, cyber security and related computing subjects to enable you to obtain excellent career opportunities within the industry. In particular, the course emphasises the

application of computer systems and network hardware, the development of skills in configuration, maintenance and security of communications technology devices and the development of skills in software development using appropriate tools. You will apply these skills to the design implementation and management of networks within specific contexts (e.g. commercial or non-commercial large-scale organisations, SME's network technology development organisations, or network vendors). The course is intended to produce rounded, creative networking and security experts with the ability to enhance their own skills and expertise.

The course will produce graduates capable of delivering and managing complex network topologies using evolving technology within a wide variety of environments. This will include taking responsibility for project management, quality control and quality assurance. The graduates will work in multi-disciplinary project teams and appreciate the constraints of commercial reality.

Computer networks technologists will be involved in the full project implementation lifecycle. They investigate and analyse challenging problems and specify, design, implement and test solutions using the appropriate technology. They are good communicators who can gather requirements, write operational requirements specifications and technical reports, and discuss ideas and proposed solutions with users and subject experts. They adopt a professional approach and attitude towards work and are aware of the legal and ethical implications of their actions.

Although the course is based in the context of computer networking and security, the skills you have acquired will also allow you to work in a variety of computing disciplines.

The Programme Specification (see appendix 1) lists the Aims of the course and the Learning Outcomes that you will have achieved when you graduate.

The course will:

- Develop the skills and understanding of theory necessary for the graduates to be employed in a Computing environment
- Encourage and enable students to become independent learners.
- 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 students to develop transferable skills and enhance subject-specific expertise by undertaking a work placement

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 defined in the programme specification. 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. Identify, evaluate and justify appropriate hardware, systems software and communications protocols required for secure network design and implementation
4. Competently identify, assess and use tools and techniques for the management of networks
5. Competently identify, assess and use tools and techniques to evaluate the security of networks
6. Solve technical and human problems relating to the development and use of IT-based systems
7. Evaluate and recommend the most appropriate network technology for a specific application
8. Design and implement secure, modern networks
9. Successfully complete a substantial networking and/or security project
10. Investigate complex situations thoroughly and impartially
11. Locate, evaluate and integrate information from multiple sources
12. Evaluate ideas, methods and systems
13. Analyse and solve problems
14. Communicate effectively with clients, users and developers
15. Learn and work independently and as part of a team
16. Operate within an ethical and legal framework appropriate to computing professionals.
17. Plan, perform, manage and report on a relevant project
18. Identify and set personal goals relevant to long-term educational and career planning

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

What is BCS Accreditation?

This course currently holds initial accreditation* with the BCS, the Chartered Institute for IT on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for Incorporated Engineer and partially meeting the academic requirement for a Chartered Engineer. This is the highest level of accreditation for MComp (Hons) programmes and makes it easier for you to obtain Chartered Status after you start working. For individuals, Chartered status is a formal indicator of your skills and willingness to accept the responsibility of a professional engineer. See <http://www.bcs.org/upload/pdf/conduct.pdf> for the standards that you are expected to uphold.

**initial accreditation will be reviewed by the BCS following graduation of the first cohort (July 2021), providing all requirements of the BCS are met the accreditation will be confirmed and backdated for all students who started the programme from September 2018 onwards.*

1.2 Course Team

Key members of your course team are Elizabeth Baker (EBaker@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 cannot 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



Course Administration Service 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



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.

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 do not 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 Blackboard.

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 4 year Integrated Honours Masters course, you will take 24 modules, six in each of 4 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 4-7, roughly corresponding to years 1-4 of your Masters. 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 Masters.

To obtain an Integrated Masters Degree, you must pass 24 modules at level 4 or above, with at least 12 at level 6 or 7, with at least 6 at level 7. 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.

Expertise in computer networking and security requires skills in a range of disciplines. To design and implement a network requires expertise including, understanding of network and systems hardware, network systems software and communication processes, programming and project management.

The course structure has three strands: technical, network and security-specific, and project management. The technical strand develops general computing skills that are relevant to network development. The network and security-specific strand looks at network hardware, systems software, protocols, security and network management. 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 a range of modules designed to introduce you to fundamental computing concepts such as computer networking, security, programming and systems analysis. [Note: the module tutor may change from one year to the next.]

Code	Module Title
CO1507	Introduction to Networking
CO1508	Computer Systems and Security
CO1401	Programming [1/2 module] Semester 2
CO1404	Introduction to Programming [1/2 module] Semester 1
CO1605	Systems Analysis & Database Design
CO1706	Interactive Applications
CO1111	Computing Challenge

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 Introduction to Networking and the Computer Systems and Security modules may look like the most important modules for the Computer Networking and Security degree, it is important to have a broad background in computing.

The Computing Challenge introduces teamwork and presentation skills, which help you to work on projects and to present to clients and management.

Systems Analysis and Database Design and Interactive Applications, discuss the gathering of user requirements, database technology, web applications and user interfaces, which will help you to understand and support modern distributed systems.

Computer programming is central to computing in general, so even if you are not involved in the development of complex software, your knowledge of computer programming will help you to develop programming scripts for automating networking tasks. In addition, understanding how computer code may accidentally introduce security vulnerabilities to networked systems is important for networking and security professionals

The Second Stage

In the second stage, you will take a specialised networking module that follows the Cisco Academy syllabus, computer security and a module in network management. Students who have an aptitude for programming can take an advanced programming module. For other students a module in agile systems design is available, a subject area of increasing importance in designing networking projects. The Agile Professional includes a team project to develop network products. A module in hardware and operating system technology completes the programme.

Code	Title	Credits	Status
CO2516	Network Management	20	Compulsory
CO2511	Intro to Network Routing	20	Compulsory
CO2508	Computer Security	20	Compulsory
CO2403	The Agile Professional	20	Compulsory
CO2519	Internet of Things	20	Compulsory
CO2402	Advanced Programming	20	Optional
CO2701	Database Systems	20	Optional
CO2714	Internet Application Development	20	Optional

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

Code	Title	Credits	Status
CO2802	Industrial Placement Year	120	Optional

The Third Stage

The third year includes three networking modules, Wireless and Mobile computing which covers the full range of current technology, Advanced Routing that completes the Cisco Academy course, and a module in cloud computing. Security is covered in the Penetration Testing module. The project management strand culminates in the development of a network design or product in a 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.

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

Code	Title	Credits	Status
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CO3517	Penetration Testing	20	Compulsory
CO3513	Advanced Routing	20	Compulsory
CO3514	Wireless and Mobile Networks	20	Compulsory
CO3721	Cloud Computing	20	Optional
CO3603	Computers Society and the Law	20	Optional
CO3812	Science Communication	20	Optional
CO3808	Honours Project	40	Compulsory

At the end of the third stage students with an APM below 50% in their level 5 modules will normally progress onto BSc (Hons) Computer Networking and Security.

The Fourth Stage

Computer Security, Advanced Topics in Security and Information Security Management are the key computer security related modules during the Integrated Masters stage. Higher intellectual thinking skills are developed during the Critical Analysis module. The MComp project is an opportunity to complete project work that relates directly to computer security.

Code	Title	Credits	Status
CO4509	Computer Security	20	Compulsory
CO4510	Advanced Topics in Security	20	Compulsory
CO4512	Information Security Management	20	Compulsory
CO4820	Critical Analysis	20	Compulsory
CO4831	MComp Project	40	Compulsory

The programme specification lists the modules that can be taken as part of your course. Some optional modules may not be available every year and timetabling clashes may prevent you taking certain combinations of modules.

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 will not 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

20 credits is a standard module size and equals 200 notional learning hours.


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 practicals. 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 sometimes unavoidable, 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 go undetected until it is too late for us to help. Any student who makes false entries may 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 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 Blackboard. However, they are not a substitute for making your own notes. You do not 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. Do not 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 do not understand something, do not 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 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 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 are up to. You can be sure you are not the only one finding the exercise difficult. If the task were straightforward, we would 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 CO1801, Practitioner Skills.

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)



You can access paper-based and electronic resources through the library (see <http://www.uclan.ac.uk/students/study/library/index.php> for more information and a link to the library opening hours). Extensive [resources](#) to support your studies are provided by LIS – library and IT staff. Take advantage of the free training sessions designed to enable you to gain all the skills you need for your research and study.

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.

Please report any complaints or problems with equipment to LIS (LISCustomerSupport@uclan.ac.uk) as well as to the relevant module tutor. LIS prefer to deal with problems first-hand and rather than indirectly through academic staff. Moreover, by dealing with LIS directly, your problem should be dealt with more quickly.

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 – you do not need to read it 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 Blackboard and you should make sure that you make use of this outside as well as in class.

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 – do not 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 Elizabeth Baker (EBaker@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 cannot 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 CEPS. 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 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 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, 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% (50% for level 7 modules)
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 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)

Details of the Protocol for the operation of SSLCs is included in section 8.2 of the University Student Handbook. 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. 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

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	
5. Title of Final Award	MComp (Hons) Computer Networks and Security
6. Modes of Attendance offered	Full-time Part-time Sandwich (Additional Year)
7a) UCAS Code	
7b) JACS Code	I120
8. Relevant Subject Benchmarking Group(s)	Computing
9. Other external influences	BCS, the Chartered Institute for IT
10. Date of production/revision of this form	April 2017
11. Aims of the Programme	
This course covers networking from the basics of wired network infrastructure to the most up-to-date wireless technologies. In addition, it includes a particular focus on both computer and network security.	
Common Computing Aims	
<ul style="list-style-type: none"> To develop the skills and understanding of theory necessary for the graduates to be employed in a computing environment as networking or security professionals. 	

<ul style="list-style-type: none"> • To encourage and enable students to become independent learners.
<ul style="list-style-type: none"> • To develop critical evaluation, communication, enterprise and self-management skills.
<ul style="list-style-type: none"> • To produce graduates with the skills and confidence to solve problems independently and as part of a team
<ul style="list-style-type: none"> • To provide an opportunity for students to develop transferable skills and enhance subject-specific expertise by undertaking a work placement
Specific Aims
<ul style="list-style-type: none"> • To enable students to apply their hardware and software skills to combating threats to computer security.
<ul style="list-style-type: none"> • To develop the technical expertise needed to evaluate and recommend the most appropriate network technology for a specific application
<ul style="list-style-type: none"> • To explore the design and implementation of secure, modern networks
<ul style="list-style-type: none"> • To enable the students to successfully complete both substantial networking projects and substantial security projects.
<ul style="list-style-type: none"> • To develop a critical attitude to legal and ethical issues relating to computer networking
<ul style="list-style-type: none"> • To encourage independent and innovative work at a post-graduate level.
<ul style="list-style-type: none"> • To foster research skills.

12. Learning Outcomes, Teaching, Learning and Assessment Methods
A. Knowledge and Understanding
<p>The successful student will be able to</p> <p>A1. Explain, evaluate and apply techniques and methods to solve a range of computing problems</p> <p>A2. Evaluate and apply project management tools and techniques</p> <p>A3. Identify, evaluate and justify appropriate hardware, systems software, communications protocols and security required for network design and implementation</p> <p>A4. Competently identify, assess and use tools and techniques for the management of networks</p> <p>A5. Interpret relevant literature relating to computer networking and security</p> <p>A6. Critically evaluate tools, techniques and policies for the management of IT systems' security</p>
Teaching and Learning Methods
<p>Acquisition of knowledge is mainly supported through lectures and directed learning. The role of directed learning increases as the course progresses. At level 7, this is greatly supplemented by an emphasis upon self-directed learning and academic literature. 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.</p>
Assessment methods
<p>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.</p>
B. Subject-specific skills
<p>The successful student will be able to</p> <p>B1. Solve technical and human problems relating to the development and use of IT-based systems</p> <p>B2. Evaluate and recommend the most appropriate and secure network technology for a specific application</p> <p>B3. Design and implement secure, modern networks</p> <p>B4. Successfully complete substantial networking and security projects</p> <p>B5. Undertake a risk assessment and analysis of the security of an IT system</p> <p>B6. Select and use tools for securing and investigating an IT system</p>
Teaching and Learning Methods
<p>Computing is a highly practical subject. Skills are developed in a co-ordinated and progressive manner during the four 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</p>

exercise creativity and develop their own solutions. Lectures, sometimes involving on-line demonstration, are supported by tutorials, seminars, practical exercises and directed work. The level 7 modules focus on new and innovative ideas and techniques in security and students will be expected to explore and apply these in project 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
- C5. Critically analyse and apply relevant research literature
- C6. Analyse complex concepts and communicate the outcome effectively and appropriately

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. The level 7 modules allow the students independently to apply the research skills developed and practised during earlier years to solve complex problems.

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, developers and academics
- 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 Systems Analysis and Database Design modules at level 4, alongside the introduction and discussion of relevant legal and ethical topics in Computer Systems and Security. 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 in the Computing Challenge module. It is reinforced in team exercises in 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 an extended report. 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, 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.

Assessment methods

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

In the Computing Challenge, the students participate in stand-up meetings mid-week to report on the team operation and progress and make a presentation of their achievements at the end of the week to demonstrate their products. During these, they discuss individual contributions and appropriate actions. In The Agile Professional, students hold regular meetings to monitor progress, informally assess individual performance and sign-off work that has met their quality standards. Progress reports are assessed formally. Students are responsible as a team for an assessed literature review and individually for a critical evaluation of the project.

13. Programme Structures*				14. Awards and Credits*
Level	Module Code	Module Title	Credit rating	
Level 7	CO4509 CO4510 CO4512 CO4820 CO4831	Digital Security Advanced Topics in Security Information Security Management Critical Analysis MComp Project	20 20 20 20 40	MComp (Hons) in Computer Networks and Security Requires 480 credits at Level 4 or above including 360 credits at Level 5 or above including 220 credits at Level 6 or above with a minimum with a minimum of 120 credits at Level 7
Level 6	CO3513 CO3514 CO3517 CO3808 CO3603 CO3721 CO3812	Advanced Routing Wireless and Mobile Networks Penetration Testing Double Project One from: Computers, Society and Law Cloud Computing Science Communication A level 5 option which hasn't been taken	20 20 20 40 20 20 20 20	BSc (Hons) Computer Networks and Security Requires 360 credits excluding CO2802 but including a minimum of 240 at Level 5 or above and 100 at Level 6 BSc Computer Networks and Security Requires 320 credits excluding CO2802 but including a minimum of 200 at Level 5 or above and 60 at Level 6 While students will be considered on a case by case basis, students with an APM below 50% in their level 5 modules will normally progress onto BSc (Hons) Computer Networking and Security.
Level 5	CO2802	Only for a Sandwich award Industrial Placement Year	120	Students who successfully complete CO2802, Industrial Placement Year, in addition to meeting the requirements of the award, will have the award "in sandwich mode"
Level 5	CO2403 CO2508 CO2511 CO2516 CO2519 CO2402 CO2701 CO2714	The Agile Professional Computer Security Introduction to Routing Network Management Interacting with the Internet of Things One from Advanced Programming Database Systems Internet Application Development	20 20 20 20 20 20 20	Diploma of Higher Education in Computer Networks and Security Requires 240 credits including a minimum of 100 at Level 5 or above
Level 4	CO1404 CO1401 CO1507 CO1111 CO1605	Introduction to Programming. Programming Introduction to Networking The Computing Challenge Systems Analysis and Database Design	10 10 20 20 20	Certificate of Higher Education in Computing Requires 120 credits at Level 4 or above

	CO1706 CO1508	Interactive Applications Computer Systems and Security	20 20	
Level 3*	COC001 COC002 COC003 COC004 COC005 COC006	Introduction to Software Development Investigating IT Problem-solving for Computing Study Skills 1 – Learning How to Learn Study Skills 2 – Developing Academic Skills Introduction to Mathematical Methods	20 20 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

*** 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 and continued in the Practitioner Skills module. 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.

In the MComp year, students work closely with their project supervisors and the course leader to set appropriate career-oriented goals.

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.*

**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.

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

Foundation Entry:

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

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 – MComp (Hons) Computer Networks and Security

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	B6	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5		
LEVEL 7	CO4509	Digital Security	COMP	✓		✓	✓	✓	✓		✓	✓		✓	✓	✓		✓	✓	✓	✓							
	CO4510	Advanced Topics in Security	COMP	✓			✓	✓	✓			✓			✓	✓	✓		✓	✓		✓	✓	✓				
	CO4512	Information Security Management	COMP	✓			✓	✓			✓	✓	✓		✓	✓	✓		✓	✓	✓	✓						
	CO4820	Critical Analysis	COMP					✓			✓						✓	✓	✓	✓	✓	✓	✓	✓		✓		
	CO4831	MComp Project	COMP	✓	✓	✓	✓	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
LEVEL 6	CO3513	Advanced Routing	COMP	✓		✓	✓			✓							✓	✓	✓				✓					
	CO3514	Wireless and Mobile Networks	COMP	✓		✓	✓			✓		✓					✓	✓	✓				✓					
	CO3517	Penetration Testing	COMP	✓							✓							✓	✓	✓			✓		✓			
	CO3808	Double Project	COMP	✓	✓	✓	✓				✓		✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓		
	CO3603	Computers, Society and Law	O	✓														✓	✓									
	CO3721	Cloud Computing	O	✓															✓									
	CO3812	Science Communication	O															✓	✓									
LEVEL 5	CO2403	The Agile Professional	COMP	✓	✓			✓			✓		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓		
	CO2508	Computer Security	COMP	✓		✓		✓	✓	✓	✓	✓					✓	✓		✓					✓			
	CO2511	Introduction to Routing	COMP	✓		✓	✓		✓	✓	✓									✓								
	CO2516	Network Management	COMP	✓		✓	✓		✓	✓	✓						✓			✓								
	CO2519	Interacting with the Internet of Things	COMP	✓		✓		✓	✓			✓	✓				✓	✓	✓	✓			✓					
	CO2402	Advanced Programming	O	✓							✓						✓	✓	✓	✓			✓					
	CO2701	Database Systems	O	✓							✓									✓								
	CO2714	Internet Application Development	O	✓	✓		✓	✓	✓	✓							✓			✓								
	CO2802	Industrial Placement Year	O	✓							✓									✓			✓	✓	✓	✓		

LEVEL 4	CO1401	Programming	COMP	✓						✓								✓							
	CO1404	Introduction to Programming	COMP	✓						✓								✓							
	CO1507	Introduction to Networking	COMP	✓		✓	✓	✓	✓	✓			✓					✓							
	CO1111	The Computing Challenge	COMP	✓			✓	✓	✓	✓	✓		✓					✓			✓	✓	✓	✓	
	CO1605	Systems Analysis and Database Design	COMP	✓						✓						✓		✓							
	CO1706	Interactive Applications	COMP	✓						✓								✓							
	CO1508	Computer Systems and Security	COMP	✓		✓	✓		✓				✓					✓					✓		

19. LEARNING OUTCOMES FOR EXIT AWARDS:

Learning outcomes for the award of: BSc (Hons) Computer Networks 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. Identify, evaluate and justify appropriate hardware, systems software and communications protocols and security required for network design and implementation
- A4. Competently identify, assess and use tools and techniques for the management of networks
- A5. Interpret relevant literature relating to computer networking and security
- A6. Critically evaluate tools, techniques and policies for the management of IT systems' security
- B1. Solve technical and human problems relating to the development and use of IT-based systems
- B2. Evaluate and recommend the most appropriate and secure network technology for a specific application
- B3. Design and implement secure, modern networks
- B4. Successfully complete substantial networking and security projects
- B5. Undertake a risk assessment and analysis of the security of an IT system
- 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 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

Learning outcomes for the award of: BSc Computer Networks and Security

- A1. Explain, evaluate and apply techniques, technology and methods to network design and implementation
- A2. Evaluate and apply project management tools and techniques
- A3. Competently identify, assess and use tools and techniques for the management of networks
- A6. Critically evaluate tools, techniques and policies for the management of IT systems' security
- B1. Solve technical and human problems relating to the development and use of IT-based systems
- B2. Evaluate and recommend the most appropriate and secure network technology for a specific application
- B3. Design and implement secure, modern networks
- B5. Undertake a risk assessment and analysis of the security of an IT system
- C1. Locate, evaluate and integrate information from multiple sources
- C2. Discuss ideas, methods and systems
- C3. Analyse and solve problems
- D1. Communicate effectively with clients, users, technicians 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

Learning outcomes for the award of: Diploma of Higher Education in Computer Networks and Security

- A1. Explain and apply techniques, technology and methods to network design and implementation
- A2. Apply project management tools and techniques
- A3. Use tools and techniques for the management of networks
- A5. Interpret relevant literature relating to computer networking and security
- B1. Solve technical and human problems relating to the development and use of IT-based systems
- B2. Evaluate and recommend the most appropriate and secure network technology for a specific application
- C1. Locate and use information from multiple sources

- C2. Analyse and solve problems relating to computer networks
- D1. Communicate with clients, users, technicians and developers
- D2. Learn and work independently and as part of a team

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.