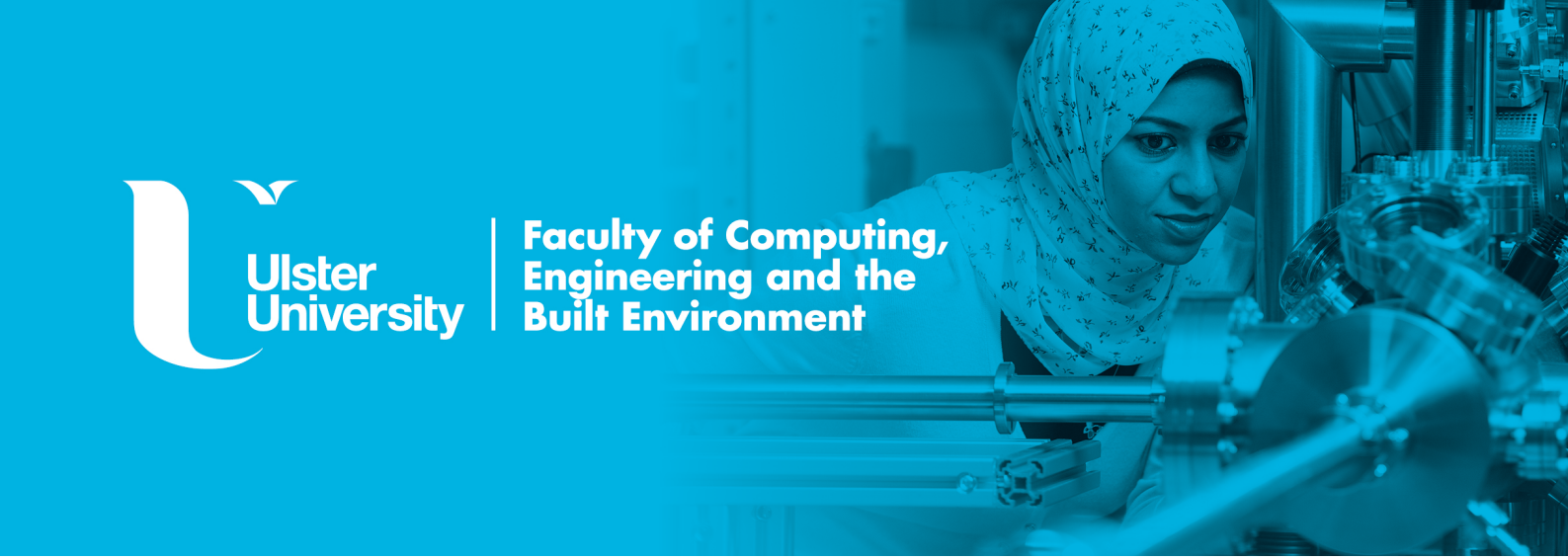

Ulster University | Faculty of Computing, Engineering and the Built Environment

MODULE HANDBOOK 2025/26

Module Title

Module Code: Systems Security (72754)

Programme(s): BSc (Hons) Computer Science;
BSc (Hons) Information Technologies;
BSc (Hons) Business Sts w Computing
BEng (Hons) Artificial Intelligence;
BSc (Hons) Computer Science w Edu;
BSc (Hons) Computer Sc SoftSysDev;
BSc (Hons) Law with Computing;

School of Computing, Engineering and Intelligent Systems
Faculty of Computing, Engineering and the Built Environment

Kevin Curran

Module Coordinator

Room Number	MS130
Email	Kj.curran@ulster.ac.uk
Phone Number	02871 675565
Office Hours	Thursday 10:15-12.15

Notice

Please be aware the information provided within the module handbook is subject to change.

Table of Contents

Welcome

Welcome

The Syllabus lists some of the core texts and finer details of this module from an administrative viewpoint. The Syllabus is here.

The philosophy of this module is to introduce the student to the issues that arise when we consider the security of computer networks, from both a “white-hat” (defensive), and “black-hat” (offensive) perspective.

Kind regards

Kevin Curran

Module Coordinator

September 2025

1. Module Overview and Communication

Module Details			
Module Title	Systems Security		
Module Code	COM320	**Module Level**	6
Credit points	20	**Module Status**	Core
Semester	1	**Location**	Derry-Londonderry
Delivery Mode	Blended/Face-to-face		
Contact Details and Communication Methods			
Module Coordinator	Kevin Curran		
Teaching Staff Contact Details	Kevin Curran Email: kj.curran@ulster.ac.uk Office Hours: Thursday 10:15-12:15		
 **General Information, Queries and Consultations**	**If you require advice on any aspect of the module, please read the guidance provided here, in the Module Handbook.** For General Queries, please utilise the class Discussion Board. For Specific Queries or studies advice, you can avail of the 'Virtual Office Hours.' Please contact me via email if you have questions relating to the module or wish to schedule an appointment. Please note, we aim to respond to emails within 48 hours during the working week.		
 **Module Announcements**	Key announcements will be presented during tutor-led activities. Out of class communication including notifications, reminders, etc will be distributed via the Blackboard Announcement tool. You will receive a duplication of the announcement direct to your student email inbox. **It is essential that you check your emails regularly.** It also advisable that you download the 'Blackboard' App as an alternative to access these announcements, notifications, and reminders as well as content.		

2. Sustainable Development Goals (SDGs) and Graduate Attributes (GAs) in your module

Sustainable Development Goals (SDGs)

The UN SDGs are a comprehensive set of global goals to end poverty, protect our planet, and improve living conditions of the Global Population. You are encouraged to think critically and reflect on SDGs in the context of this module.

The following SDGs are relevant in the context of this module:

 ☒	 ☐	 ☐	 ☒	 ☐	 ☐
 ☐	 ☐	 ☒	 ☐	 ☒	 ☐
 ☐	 ☐	 ☐	 ☐	 ☐	

Graduate Attributes (GAs)

Ulster University's Graduate Attributes are a high-level set of competencies, developing universal understandings, skills, qualities, and values.

As a result of engaging with this module you will have opportunities to develop and practise the following selected attributes:

Thriving Individual	D	A
Enhancing Potential	☒	☐
Confidence and Resilience	☒	☐
Well-being	☐	☐
Growth Mindset	☒	☐

Engaged Learner	D	A
Subject Specialist	☐	☒
Creative Problem Solver	☒	☐
Researcher	☒	☐
Critical Thinker	☒	☐

Collaborative Professional	D	A
Responsible Team Player	☒	☐
Effective Communicator	☒	☐
Enterprising Innovator	☐	☐
Digital Fluent Professional	☐	☐

Active Citizen	D	A
Citizen with Integrity	☐	☐
Inclusive Citizen	☐	☐
Sustainable Citizen	☐	☐
Future Thinker	☒	☐

KEY:
D = Developed
A = Assessed

3. Aim and Learning Outcomes

Module Rationale

It is important that students have a strong foundation in the principles of cybersecurity between in the context of both local and cloud systems and core underlying principles of cybersecurity.

Overall Aim of the Module

This module begins by introducing the fundamental principles of security, such as confidentiality, integrity, and availability, alongside the concepts of threats, vulnerabilities, and risks. It usually provides an overview of how computer networks and systems work, explaining common protocols, firewalls, intrusion detection systems, and secure system configuration. Students are then introduced to cryptography, covering encryption methods, hashing, digital signatures, and secure communications.

The module explores the landscape of cyber threats, including malware, phishing, denial-of-service attacks, and advanced persistent threats, before moving into defensive measures such as endpoint protection, identity and access management, multifactor authentication, and the use of monitoring and logging tools. Many programs also include offensive security components, offering an introduction to ethical hacking, penetration testing, and tools like Metasploit, Wireshark, and Nmap. In addition to technical skills, cybersecurity courses emphasize governance, policies, and compliance frameworks such as ISO 27001, NIST, and GDPR, as well as incident response and disaster recovery planning. Emerging topics like IoT, cloud, mobile security, artificial intelligence in security, and Zero Trust architectures are often included to keep learners up to date with industry trends.

Learning Outcomes

What you should be able to do by the end of this module?

Successful participants will be able to:

1. Demonstrate knowledge and understanding of the key principles and concepts that underpin cybersecurity.
2. Describe core functions and techniques used in the planning, deployment and monitoring of cybersecurity tools.
3. Display an appreciation of the technical and research challenges facing cybersecurity.
4. Evaluate cybersecurity techniques and the securing of networks and use tools to analyse the traffic flowing over networks.

4. Assessment and Feedback

What you need to do to demonstrate achievement of learning?

Summary Assessment Information

This module will be assessed via two items of assessment

Type / Element	Assessment method Submission date, time and submission method	Percentage (%) and word count equivalent	Feedback due date
Element 1 ***Coursework 1***	Essay DATE: October 22nd 2025 TIME: 12:30 – 14:00 Submit via Blackboard	25%	20 working days post submission date (via Blackboard Ultra)
Element 2 ***Coursework 2***	Class Test 90 minutes duration DATE: 10th October 2025 TIME: 12:30 – 14:00 Submit via Blackboard	75%	20 working days post submission date (via Blackboard Ultra)

Assessment Guidance

1) Word count includes the title page, contents page, in-text references and citations but excludes tables, reference list and appendices.
2) Your work should include references to relevant journal articles and other good quality information sources and should be properly laid out using the Harvard system of referencing. More detailed guidance is available in the Subject Guides. We encourage you to make good use of all the support services offered by your Campus Librarian, further details are in the Learning Support Services Section.
3) You should refer to the assessment criteria to provide fuller details of the marking criteria for each classification band.
4) In addition, you should refer to the standard assessment guidelines as presented in your Course Handbook/Support Area, this includes guidance and policies on referencing style, plagiarism, etc.
5) We recommend the use of Studiosity which offers constructive feedback on draft written submissions within 24 hrs.

6) **Coursework must be submitted by the dates specified.** Coursework submitted after the deadline, without prior approval, is not normally accepted. For further guidance on the late submission of coursework, please see the course handbook.
7) Assessments must be submitted as per the assessment brief.

   Please note: Words in excess of +10% of the word count will not be marked.

Coursework

Assessment Tasks

This assessment consists of a class tests that will assess knowledge of material covered in lectures and labs

Coursework 1 – BRIEF

a) The essay is worth 25% of the overall module mark.
b) The essay deliverable will take place in week 5.
c) The class test will take place in the practical laboratories under exam conditions.
d) Detailed guidance and topics will be given prior to the test.

Coursework 1 – FEEDBACK

Feedback (marks) on the assessment will be provided within 4 working weeks of completing the test via Blackboard.

Coursework 2 – BRIEF

a) The class test is worth 75% of the overall module mark.
b) The class test will take place in week 12 during the practical time as outlined in the assessment summary table above.
c) The class test will take place in the practical laboratories under exam conditions.
d) You will have 1.5 hours to complete the test.
e) The test will consist of 20 short questions on material covered in labs and 10 longer questions worth 6 marks each based on lecture materual.
f) You must insert your answers to each test question on Blackboard.

g) You have just ONE attempt to complete the test.

h) Detailed guidance and topics will be given prior to the test.

Coursework 2 – FEEDBACK

Feedback (marks) on the assessment will be provided within 4 working weeks of completing the test via Blackboard.

5. Learning Resources

A list of current learning resources specifically chosen to build your knowledge and understanding for this module

Reading List

Also available online via Key Links: https://ulster.keylinks.org/#/

Books/Journal Article/Publications Required Reading (Must read)

Pfleeger, C., Pleeger, S.L. & Margulies, J. (2016) Security in Computing. Fifth Edition, Prentice Hall, ISBN 978-0-13-408504-3

Books/Journal Article/Publications Recommended Reading (Should read/Could read)

Ferguson, N. & Schneier, B. (2010) Cryptography Engineering: Design Principles and Practical Applications, Wiley, ISBN: 0470474246

Klein, T. (2011) A Guided Tour Through the Wilds of Software Security, No Starch Press. ISBN: 978-1-59327-385-9

Seitz, J. (2014) Black Hat Python: Python Programming for Hackers and Pentesters, No Starch Press, ISBN: 1593275900

Stallings, W., Brown, L. (2015) Computer Security: Principles and Practices: International Edition, 3/E, Pearson: ISBN: 978-0-13-377392

Stallings, W. (2016) Cryptography and Network Security: Principles and Practice, Global Edition, Pearson, ISBN: 1292158581

Useful Journals

- **International Journal of Cybersecurity (Springer)** – Covers theoretical and practical aspects of cybersecurity.
- **IET Information Security** – Publishes research on cybersecurity.
- **IEEE Transactions on Information Forensics and Security**– Focuses on forensics and cybersecurity.
- **ACM SIGCOMM Computer Communication Review (CCR)** – Features short papers and technical discussions in networking.

Useful Library Databases and Websites

Library's Support Services

In collaboration with teaching staff, your Campus Librarian will be delivering timetabled workshops to ensure you are able to make the best use of the Library's services and information resources in successfully completing your coursework. Furthermore, if you need specific help with an assignment or dissertation then you can make an appointment to meet with your Subject Librarian by email, phone or through using the appointments schedule.

Online support is also available by accessing the Library's Guides as these provide help in developing your information and research skills by identifying the best learning resources available, forming effective literature searches, offering academic writing support and adopting the best referencing techniques.

Blackboard Learning Support

If you require help or support with any of the digital learning tools utilised within your module, please contact The Blackboard Helpdesk via:

028 9536 7188, or by e-mail to blackboardhelpdesk@ulster.ac.uk

6. Organisation and Management

Types of learning activities that will make up your weekly timetable

XXX [Module Title], is a 20-credit point module, this requires approximately 200 hours of your commitment, distributed through the following learning and teaching activities over the 15-week semester. For a description of the nature of the learning activities please refer to your course handbook.

Summary of Learning Activities

Learning Activities: Week 1-12	Indicative Weekly Hours	Total Hours (200 hours)
Lecture and Class Activities	2 hours	24
Seminar or Seminar Activities	1 hour	12
Other, Directed Learning Activities	3 hours	36
Independent Study: Week 1-15	**Indicative Guide**	
Assigned Reading and Note-taking	3 hours	45
Assessment Activities and Seminar Preparation	5.5 hours	83

The teaching and learning plan provides a more detailed overview of content on a weekly basis.

Module delivery will typically consist of a two-hour lecture and a one-hour Seminar although format may vary slightly between weeks/sessions.

For the day, time and room number view your **Timetable** via PUBLISH.

Seminars – please refer to the teaching and learning plan below for the seminar topic. **Attendance at seminars is most important and therefore will be monitored.** All students should download the SEAtS Student Attendance App to their smartphones. Regularly checking into class using the app helps you keep track of your attendance and ensures you stay on track with your studies. Please view the university attendance website for more information including user guides, video demonstrations, and FAQs.

Teaching and Learning Plan

The teaching plan/order of weekly topics is subject to change. The list below provides an outline summary of weekly activities and further information is available on BBL in the relevant week's folder. **Students will be expected to engage in all prescribed activities that contribute towards final assessment.**

Week/L&T Methods	Curriculum Content/Topic Title	Independent/Directed Study, includes: Required Reading, Seminar Preparation, and/or Assessment Preparation and due dates
Week 1 Lecture	**Module Welcome** Introductions and Student Voice – Expectations of the module: Overview of Module Handbook: Overview of the Blackboard Area: **Lecture Title: Introduction to cybersecurity** **Content:** Overall high level introduction to cybersecurity and all topics to be covered in depth.	**Reading:** Tor: The Second-Generation Onion Router by Dingledine et al.
Week 2 Lecture	**Lecture Title: Authentication – Access control & cryptography** **Content:** Lecture covering authentication & cryptography	**Reading:** Cloud Security – A short primer by Joel-Ahmed Mondol.
Week 3 Lecture	**Lecture Title: Programs and Programming** **Content:** Lecture covering programming practices	**Reading:** Microsoft vs. Apple: Resilience against Distributed DoS Attack by Altunbasak et al.

Week/L&T Methods	Curriculum Content/Topic Title	Independent/Directed Study, includes: Required Reading, Seminar Preparation, and/or Assessment Preparation and due dates
Week 4 Lecture	**Lecture Title: Network Security** **Content:** Lecture covering all aspects of network security	**Reading:** Can we make operating systems reliable and secure by Tanenbaum et al.
Week 5 Lecture	**Learning Objectives: Operating Systems** **Content:** Lecture covering all aspects of operating systems	**Reading:** A Taxonomy of Buffer Overflow Characteristics by Matt Bishop et al. **Class test 1 – Essay deadline**
Week 6 Lecture	**Lecture Title: No lecture** **Content:**	
Week 7 Lecture	**Lecture Title: Databases** **Content:** Lecture covering aspects of databases and inference	**Reading:** It is Time for Trustworthy Systems by Hesier et al.
Week 8 Lecture	**Lecture Title: Cloud Computing** **Content:** Lecture covering all aspects of cloud computing	**Reading:** A Survey on Security for Mobile Devices by La Polla et al.
Week 9 Lecture	**Lecture Title: Privacy & Security Incident Management** **Content:** Lecture covering keys aspects of privacy	**Reading:** Why I wrote PGP by Phil Zimmermann.
Week 10 Lecture	**Lecture Title: Cryptography** **Content:** Lecture covering keys aspects of cryptography.	**Reading:** Keystroke Dynamics for User Authentication by Zhong et al.

Week/L&T Methods	Curriculum Content/Topic Title	Independent/Directed Study, includes: Required Reading, Seminar Preparation, and/or Assessment Preparation and due dates
Week 11 Lecture	**Lecture Title: Legal Issues & Ethics** **Content:** Lecture covering key aspects of ethics and law.	**Reading:** Legal, Ethical & Social Issues in the case of an Intrusive Remote Monitoring Software by McBrearty et al
Week 12 Lecture	**Lecture Title: Recap on all topics** **Content:** Lecture which provides a reviosn on all core topics. **Module Overview and Review:** Recap on key principles	**Reading:** A Lightweight Authentication Protocol for Secure Communications between Resource-Limited Devices and Wireless Sensor Networks by Ksiazak et al. **Coursework 2 – Class Test April 17th 2025**

7. Student Voice and Support Services

How we support you

As a course team, we incorporate the key partnership principles set out in the joint UU & Ulster University Students' Union Student Voice Guidelines and proactively engage with the democratic election of UUSU academic student reps (Faculty Reps, School/Dept Reps & Course Reps) to ensure that student opinion is heard at Ulster. We respect your views and welcome your honest and constructive feedback on the module.
There are several ways to do this:

You can contact your Module Coordinator about any queries related to your learning experiences on the module as/when you have them.

You can voice your opinions through the formal Staff/Student Consultative Committee process by contacting one of the elected UUSU Course Reps in your class.

You will have the opportunity to give feedback on the module through completing the online Student Module Feedback Survey.

UUSU Advice Bureau Service

If you are experiencing difficulties that are impacting your studies, you can contact the Advice Bureau in the Students' Union (UUSU). You can get advice and guidance on issues such as - complaints, appeals, housing problems, disciplinaries, and info on various support providers available. To have a chat with the team, contact UUSU online.

UU Student Wellbeing Service

Ulster University's Student Wellbeing team is available to help you manage common pressures many students experience while studying in higher education. Common pressures include stress, relationship issues, financial problems, and managing disability-related challenges, including mental health difficulties. There is no stigma to seeking support to maximise your wellbeing and achievement at UU.

Student Wellbeing support is free and confidential and is located on each of our campuses. Please view the Student Wellbeing pages for details on how to contact student wellbeing staff.

Other external helplines are also available.

UU Student Success Team

Ulster University's Student Success team has developed a series of academic and study skills training resources and workshops to help you succeed educationally and develop personally and professionally. You can access these resources via the Student Success website or you can contact the team directly via email.