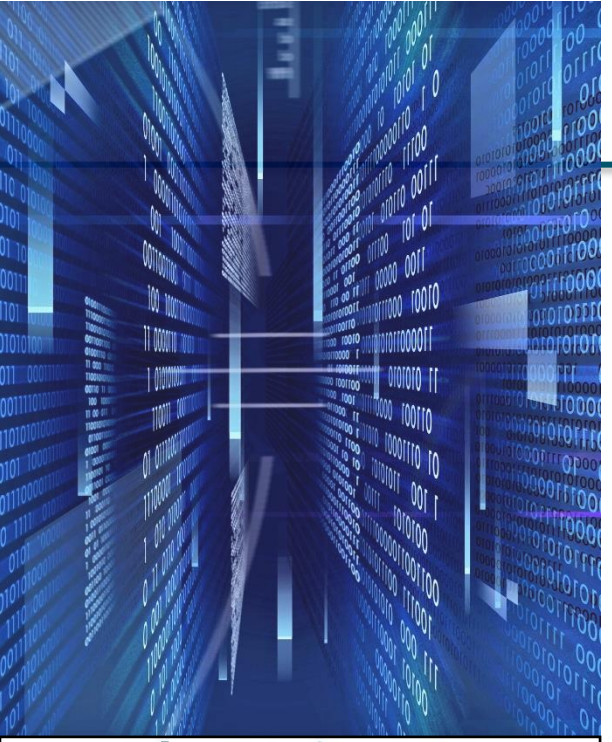

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COMP6224 2022-23
Foundations of Cyber Security

Module Introduction

Week 1, 4th October 2022 9:00am

Dr Leonardo Aniello

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COMP6224 2022-23 Teaching Team

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Module Overview

University of Southampton

COMP6224 Foundations of Cyber Security

This module aims to give an overview of cyber security.

The module will equip students with a clear view of the current cyber security landscape considering not only technical measures and defences, but also the other subject areas that apply, including legal, management, crime, risk, social and human factors.

Learning Outcomes

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Knowledge and Understanding

Having successfully completed this module, you should be able to demonstrate knowledge and understanding of:

- A1. The importance of taking a multi-disciplinary approach to cyber security
- A2. The cyber threat landscape, both in terms of recent emergent issues and those issues which recur over time
- A3. The roles and influences of governments, commercial and other organisations, citizens and criminals in cyber security affairs
- A4. General principles and strategies that can be applied to systems to make them more robust to attack
- A5. Key factors in cyber security from different disciplinary views including computer science, management, law, criminology, and social sciences
- A6. Issues surrounding privacy, anonymity and pervasive passive monitoring
- A7. Managing security incidents, including digital forensic principles

Subject Specific Intellectual and Research Skills

Having successfully completed this module you should be able to:

- B1. Analyse case studies, to reinforce the different disciplinary perspectives of cyber security

Student feedback from past years

- Some relevant comments
  - CS students
    - “I feel like the module is too basic and doesn't go into details, so it's not a technical one”
    - “…the coursework was not that challenging for comp-sci students”
  - Non-CS students
    - “As a non-computer science student I found this module very challenging”
    - “The course work assignments were very clear but highly technical”

Assessment	CS Students (25)	Non-CS Students (37)
Coursework (25%)	69.92%	70.14%
Exam (75%)	57.4%	59.78%
Overall	60.53%	62.37%

Schedule

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October				November					December				January			
w1	w2	w3	w4	w5	w6	w7	w8	w9	w10	w11	w12	w13	w14	w15	w16	w17
Lectures											Christmas Vacation			Rev		
			Lab			Surg		Lab								
	Tut	Tut	Tut	Tut	Tut									Tut		
			Assignment												Exam	

- Lectures
  - Tue 9am in 54/5027
  - Tue 5pm in 2/1083
  - Thu 5pm in 2/1083
    - Tutorial on 20th Oct
    - No lecture on 15th Dec
- Tutorials
  - Mon 3pm in 2/1083 (from week 2 to 6)
  - Thu 20th Oct 5pm in 2/1083
- Labs and Cw Surgery in 59/3rd floor lab (2h)
  - Wed 2pm
  - 26th Oct - 16th Nov - 30th Nov
- Revision week
  - George on Mon 9th Jan 3pm in 2/1083
  - Ahmad on Tue 10th Jan 9am in 54/5027
  - BooJoong on Tue 10th Jan 5pm in 2/1083
  - No lecture on Thu 12th Jan

Assessment

- Coursework on Cyber-attack Analysis and Password Cracking [25%]
  - Attacker/Cyber-attack Analysis topics covered in week 1, 2 and 3
  - Password Cracking topic covered in week 4
  - Preparation Lab for Password Cracking in week 4
  - Start in week 4 (Thu 27th Oct)
  - Surgery session in week 7 (Wed 16th Nov)
  - Deadline in week 9 (Mon 28th Nov)
  - Feedback by Monday 9th Jan
- Exam [75%]

Topics

1. Basic security concepts
2. Cyber Actors
3. Cyber Attack Lifecycle (3)
4. Cyber Attacks (3)
5. User auth. and passwords (2)
6. Cryptography
7. Secure communication
8. Legal aspects in cyber security
9. Privacy
10. Cyberwarfare & Hacktivism
11. Anonymity
12. Access Control (3)
13. Security of Critical Infrastructures
14. Social Engineering
15. Pervasive passive monitoring
16. Digital Forensics (2)
17. Blockchain and cryptocurrencies (2)
18. Risk Management
19. Corporate security (2)

Leonardo Ahmad BooJoong

Overall picture

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Cyber Security

- Blockchain
- Risk Mngmt
- Digital Forensics
- Other Cyber Defences
- Privacy & Anonymity
- Cyber Essentials
- Access Control
- Secure comm.
- Authentication (include passwords)
- Cryptography

- Applications
- Data at rest
- Data in transit
- Machines
- Network

Cyber Space

- Blockchain
- Social Engineering
- Web defacements
- Influence campaigns
- DDoS
- Data breaches
- Ransomware
- Money theft
- Pervasive Passive Monitoring
- Cyber Attack Life Cycle

Cyber Attacks

Cyber Actors

- Blockchain
- Critical Infrastructures
- Hacktivism
- Cyberwarfare
- Law

Multi-disciplinary Aspects

Teaching/Learning Materials

- Main page: https://secure.ecs.soton.ac.uk/module/2223/COMP6224/33199/
  - Module information
  - Messages
  - Assignment submission
- Wiki: https://secure.ecs.soton.ac.uk/noteswiki/w/COMP6224-2223
  - Detailed schedule of lectures, tutorials and labs
  - Slides and links to recordings of sessions
  - Detailed assignment instructions – **not available yet**
- Timetable: https://timetable.soton.ac.uk/Module/?department=F8C9B169E74CEF1C7943D9CEF36E5AEB&identifier=33199
- Additional resources will be referenced in the slides
- MS Team group

Warm-up Questions

In this module we will be looking at cyber vulnerabilities in the cyberspace, how they allow cyber attacks to succeed, and what the role of cyber security is.

- What is the cyberspace?
- What is a cyber vulnerability?
- What is a cyber attack?
- What is cyber security?

Recap

- Advice
  - For non-CS students: attend tutorials!
  - For CS students: don’t underestimate this module

- Cyber security is about protecting the cyberspace from cyber attacks