

CS435-15 Advanced Computer Security

23/24

Department

Computer Science

Level

Undergraduate Level 4

Module leader

Feng Hao

Credit value

15

Module duration

10 weeks

Assessment

Multiple

Study location

University of Warwick main campus, Coventry

Description

Introductory description

The module aims to provide students with a thorough grounding in computer security from a system wide perspective, including language-based security, operating system security and network security, and to provide an enhanced and detailed understanding of selected advanced topics of current importance, such as quantum cryptography, proof-carrying code, etc.

Module aims

The module aims to provide students with a thorough grounding in computer security from a system wide perspective, including language-based security, operating system security and network security, and to provide an enhanced and detailed understanding of selected advanced topics of current importance, such as quantum cryptography, proof-carrying code, etc.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Threats and Security policy models.
Security automata, edit automata
Network security: Firewall design.
Distributed system security.
Fair exchange.
Bitcoin.
Source location privacy.

Learning outcomes

By the end of the module, students should be able to:

- Understand the various security concepts such as confidentiality, privacy etc.
- Understand various security models.
- Understand the notion of security policy enforcement and classes of policies that runtime enforceable.
- Understand the workings of firewalls.
- Understand security in distributed systems.
- Understand notions of security in E-commerce.
- Understand the technologies and techniques that support bitcoin.
- Understand source location privacy in wireless sensor networks.

Indicative reading list

Please see Talis Aspire link for most up to date list.

[View reading list on Talis Aspire](#)

Subject specific skills

CIA, threat modelling, authentication, security models, access control, symmetric cryptography, asymmetric cryptography, software security, web security, OS security, hardware security

Transferable skills

Able to critically analyze security systems identifying flaws, and able to build secure systems theoretically and practically

Study

Study time

Type	Required
Lectures	30 sessions of 1 hour (20%)
Total	150 hours

Type	Required
Practical classes	4 sessions of 1 hour (3%)
Private study	116 hours (77%)
Total	150 hours

Private study description

Background reading, secure programming practice, revision

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group D2

	Weighting	Study time
Written Report	30%	
Written Report. Roughly 2000 words, 6 page hard limit. This assignment is worth more than 3 CATS and is not, therefore, eligible for self-certification.		
In-person Examination	70%	
CS435 examination		

- Answerbook Pink (12 page)

Assessment group R2

	Weighting	Study time
In-person Examination - Resit	100%	
CS435 resit exam		

- Answerbook Pink (12 page)

Feedback on assessment

Individual written feedback on each assignment

[Past exam papers for CS435](#)

Availability

Courses

This module is Optional for:

- Year 5 of UCSA-G504 MEng Computer Science (with intercalated year)
- UCSA-G503 Undergraduate Computer Science MEng
 - Year 4 of G503 Computer Science MEng
 - Year 4 of G503 Computer Science MEng

This module is Option list A for:

- Year 4 of UCSA-G408 Undergraduate Computer Systems Engineering
- Year 5 of UCSA-G409 Undergraduate Computer Systems Engineering (with Intercalated Year)

This module is Option list B for:

- Year 4 of UCSA-G4G3 Undergraduate Discrete Mathematics
- Year 5 of UCSA-G4G4 Undergraduate Discrete Mathematics (with Intercalated Year)