

WM182-15 Computer Networks

25/26

Department

WMG

Level

Undergraduate Level 1

Module leader

Hany Atlam

Credit value

15

Module duration

30 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

The Internet and computer networks have become pervasive, playing an increasingly vital role in our interconnected world. The smooth operation of computer networks is crucial for a wide range of computing activities. Currently, networks, whether wired or wireless, are an integral component of the present and future computing landscape. Computer networks form the foundation of modern information technology systems. They enable the seamless communication and transfer of data between devices and systems. As technology continues to advance, our reliance on networks is likely to increase. The future promises even greater integration of networks into various aspects of our lives. Emerging technologies like the Internet of Things (IoT), smart cities, autonomous vehicles, and augmented reality are all heavily reliant on the underlying network infrastructure. This module develops a theoretical understanding of core networks and communications concepts, instantiation of these concepts in the dominant suite of protocols comprising Ethernet, Internet Protocol (IP), Transmission Control Protocol (TCP) and User Datagram Protocol (UDP), the practical realisation of devices to operate these protocols (switches, routers and firewalls in particular) and the cyber consequences of the organisation and configuration of these devices.

Module aims

This module aims to equip students with the essential knowledge and skills required to understand and work with computer networks effectively by providing a solid grounding of core networks and

communication concepts, establishing a strong foundation for students in this field.

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.

Outline content

The content of this module will be taught from a cyber security perspective.

- introduction
- networked applications
- reliable data delivery
- routing and forwarding
- local area networks
- resource allocation
- mobility

Learning outcomes

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

- Understand key principles behind the organisation and operation of typical communication networks and layered protocols using domain terminology.
- Develop basic network designs for small to medium-sized businesses.
- Apply the tools and techniques to configure network devices to achieve the required operating characteristics.
- Develop an illustrative analysis of network behaviour.

Indicative reading list

Kurose, James. , Ross, Keith, Computer Networking _ A Top Down Approach, 7th edition, Pearson Publisher (2016)

Donahue, Gary A., "Network Warrior", O'Reilly (2011)

Andrew S. Tanenbaum;, D. Wetherall, " Computer networks", Fifth edition, Pearson Education Limited (2014)

Subject specific skills

Network Design and Architecture
Configuration of Network Devices

Transferable skills

Problem-solving
Critical Thinking
Analytical Skills

Study

Study time

Type	Required
Supervised practical classes	18 sessions of 2 hours (24%)
Private study	54 hours (36%)
Assessment	60 hours (40%)
Total	150 hours

Private study description

Independent activity between workshops

Costs

No further costs have been identified for this module.

Assessment

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

Assessment group A

	Weighting	Study time	Eligible for self-certification
Coursework	50%	30 hours	Yes (extension)
Students will prepare a written report to assess their knowledge and skills to apply the key principles of computer networks and how tools and techniques can be used to configure network devices.			
Coursework	50%	30 hours	Yes (extension)
Students will prepare a written report to assess their understanding to configure network devices for a specific case study and explain network behaviour from captured network traffic.			

Feedback on assessment

- Written feedback for each assignment
 - Verbal feedback during tutorial sessions
 - Solutions provided to tutorial questions
-

Availability

Courses

This module is Core for:

- UWMA-H651 Undergraduate Cyber Security
 - Year 1 of H651 Cyber Security
 - Year 1 of H651 Cyber Security
 - Year 1 of H651 Cyber Security