CS1D5-15 Networks and Distributed Systems

23/24

Department
>   Computer Science

Level
>   Undergraduate Level 1

Module leader
>   Andrew Hague

Credit value
>   15

Module duration
>   4 weeks

Assessment
>   50% coursework, 50% exam

Study location
>   University of Warwick main campus, Coventry

Description

Introductory description

You cannot register for this module unless you are enrolled on the BSc Computer Science and Technology Solutions Degree Apprenticeship. It is not possible to request this module as an unusual option. If you are studying at Warwick as a visiting student from overseas it is not possible to register for this module.

This module will enable students to understand computer networks, from the physical connection through to application protocols, as well as the differences between various models and the reasons for these differences. It will also allow them to describe how network technologies affect bandwidth and latency, and the impact these may have on applications.

Module aims

The principle aim of this module is to introduce students to the concepts of networked and distributed systems and the challenges that these represent.

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.

This module will teach students about:

- The principles of communication protocols
- The internet architecture and layered TCP/IP networking models
- Link, network, and transport layer principles and functions
- Client-server applications and programming
- Peer-to-peer systems, their design, and the value of decentralisation
- Network security
- Distributed transactions
- Distributed algorithms
- Web services

Learning outcomes

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

- Demonstrate knowledge and understanding of internet architecture and the layered TCP/IP model.
- Understand client-server and peer-to-peer application models.
- Develop networked applications in a client-server model.
- Understand issues in distributed systems (including interaction, failure, and security).
- Understand the importance of and requirement for synchronisation in distributed systems.
- Understand and provide solutions to distributed algorithms for mutual exclusion, leader elections, and consensus.
- Consume Web services to create networked applications.
- Understand how some basic attacks (e.g. DDOS) are performed and steps that may be taken to mitigate them, alongside appreciating the general need for network security.
- Demonstrate the value of networked applications in the workplace.

Indicative reading list

Tanenbaum, A. and Wetherall, DJ, "Computer Networks" (2010)
Colouris, Dollimore & Kindberg, "Distributed Systems - Concepts and Design" (2011)

Subject specific skills

- Manage the development and assurance of software artefacts applying secure development practises to ensure system resilience
- Can plan, design and manage computer networks with an overall focus on the services and capabilities that network infrastructure solutions enable in an organisational context
- Identify network security risks and their resolution.
- Common vulnerabilities in computer networks including unsecure coding and unprotected networks
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Transferable skills

- Have demonstrated that they have mastered basic business disciplines, ethics and courtesies, demonstrating timeliness and focus when faced with distractions and the ability to complete tasks to a deadline with high quality.
- Flexible attitude
- Ability to perform under pressure
- A thorough approach to work

Study

Study time

Type	Required
Lectures	20 sessions of 1 hour (13%)
Tutorials	14 sessions of 1 hour (9%)
Practical classes	7 sessions of 2 hours 30 minutes (11%)
Work-based learning	40 sessions of 1 hour (27%)
Other activity	58 hours 30 minutes (39%)
Total	150 hours

Private study description

No private study requirements defined for this module.

Other activity description

Self directed learning, assignments, and 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.

Assessment group C2

	Weighting	Study time
Technical assessment	40%	
Reflective essay on practice in area within workplace	10%	
Networks and Distributed Systems Examination	50%	

Feedback on assessment

Written feedback will be provided for the practical assignment and the assessed essay

[Past exam papers for CS1D5](#)

Availability

There is currently no information about the courses for which this module is core or optional.