COMPUTER NETWORKING - 2024/5

Module code: COM2022

Module Overview

Computer networks are an essential part of almost all corporate computing facilities and even most domestic ones. Interoperability is the key – all components must conform to the same hardware and packet specifications in order that they can be interconnected successfully. This module introduces essential concepts about all the computer networking layering levels with some emphasis on the routing algorithms and implementation of network sensing.

Module provider

Computer Science and Electronic Eng

Module Leader

SHOJAFAR Mohammad (CS & EE)

Number of Credits: 15

ECTS Credits: 7.5

Framework: FHEQ Level 5

Module cap (Maximum number of students): 268

Overall student workload

Independent Learning Hours: 88

Lecture Hours: 24

Laboratory Hours: 22

Guided Learning: 11

Captured Content: 18

Module Availability

Semester 2

Prerequisites / Co-requisites

None

Module content

The module content is divided into the following areas:

- Introduction to Computer Networks; Local and Wide Area Networks

- Layers and Protocols; ISO and TCP/IP models

- Application Layer; Web services – the HTTP protocol

- Transport Layer; Addressing

- Network Layer; Routing

- Link / Physical Layer; Data communications – Ethernet, WiFi, ADSL, Physical Addressing

- The IP datagram protocol, the Address Resolution Protocol, PPP and DHCP

- The TCP protocol – flow control and retransmission methods

- Electronic mail and file transfer - SMTP, POP, IMAP and FTP.

- Network monitoring and ethical issues of monitoring network traffic

- An introduction to network security - methods, vulnerabilities and uses of encryption.

Assessment pattern

Assessment type	Unit of assessment	Weighting
School-timetabled exam/test	Invigilated class test (90min)	30
Examination	Invigilated Exam (2hrs)	70

Alternative Assessment

An individual coursework will be provided when alternative assessment is required.

Assessment Strategy

The assessment strategy is designed to provide students with the opportunity to demonstrate

·   Their understanding of the communication networks over the internet and the limitations involved by implementing the sensing and testing criteria.

·   Their ability to design an efficient means of computer networking considering all the pros and cons.

Thus, the summative assessment for this module consists of:

- · An individual class test.

- · An invigilated exam.

<u>Formative assessment and feedback</u>:

Formative feedback is provided during the lab sessions.

Module aims

- This module provides a grounding in how computers are interconnected using a variety of networking components.
- Then, it also shows how software protocols provide access to the network from higher-level applications.
- The student should also understand in how to sense the network and how the check the parameters involved in network communications.

Learning outcomes

		Attributes Developed
001	Appreciate how network protocols are layered and how they operate together to perform common communication functions;	KCT
002	Demonstrate a thorough understanding of the main protocols (TCP, IP, etc.);	CP
003	Understand the main operational characteristics of Ethernet and wireless networks;	K
004	Be familiar with the use of the RFC protocol specifications;	K
005	Be familiar with the use of network analyser software;	KP
006	Formulate arguments about network behaviour from an inspection of network packets.	KCT

Attributes Developed

C - Cognitive/analytical

K - Subject knowledge

T - Transferable skills

P - Professional/Practical skills

Methods of Teaching / Learning

Teaching on this module will consist of lectures supported by practical labs.

Students will be expected to self-study in order to prepare, complete and reflect on lab exercises.

Indicated Lecture Hours (which may also include seminars, tutorials, workshops and other contact time) are approximate and may include in-class tests where one or more of these are an assessment on the module. In-class tests are scheduled/organised separately to taught content and will be published on to student personal timetables, where they apply to taken modules, as soon as they are finalised by central administration. This will usually be after the initial publication of the teaching timetable for the relevant semester.

Reading list

Upon accessing the reading list, please search for the module using the module code: **COM2022**

Other information

Digital Capabilities

Networks are a key component of modern-day computer systems, and this module provides a solid technical grounding covering key features such as protocols, routing and security. An understanding of networks is foundational knowledge for any computer scientists and this module provides both the theory and practice of working with networks in a secure manner. .

Employability

This module provides security, network theory and software skills that are vital in today's industry. Students are equipped with both the theory and practical skills that allow them to work with and develop for networked systems securely. These skills are highly valuable to employers.

Global and Cultural Skills

Computer Science is a global language and the tools and languages used on this module can be used internationally. This module allows students to develop skills that will allow them to reason about and develop applications with global reach and collaborate with their peers around the world.

Resourcefulness and Resilience

This module teaches both the theory and practical skills to allow students to work with Networks in a secure manner. It provides the tools to reason about complex hardware and develop solutions that take advantage of them.

Programmes this module appears in

Programme	Semester	Classification	Qualifying conditions
Computer and Internet Engineering BEng (Hons)	2	Compulsory	A weighted aggregate mark of 40% is required to pass the module
Computer and Internet Engineering MEng	2	Compulsory	A weighted aggregate mark of 40% is required to pass the module
Computer Science BSc (Hons)	2	Compulsory	A weighted aggregate mark of 40% is required to pass the module
Computer Science MEng	2	Compulsory	A weighted aggregate mark of 40% is required to pass the module
Computing and Information Technology BSc (Hons)	2	Compulsory	A weighted aggregate mark of 40% is required to pass the module
Electrical and Electronic Engineering BEng (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Electrical and Electronic Engineering MEng	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Electronic Engineering BEng (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module

Programme	Semester	Classification	Qualifying conditions
[Electronic Engineering MEng](#)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
[Electronic Engineering with Computer Systems BEng (Hons)](#)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
[Electronic Engineering with Computer Systems MEng](#)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
[Electronic Engineering with Nanotechnology BEng (Hons)](#)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
[Electronic Engineering with Nanotechnology MEng](#)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
[Electronic Engineering with Space Systems BEng (Hons)](#)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
[Electronic Engineering with Space Systems MEng](#)	2	Optional	A weighted aggregate mark of 40% is required to pass the module

Please note that the information detailed within this record is accurate at the time of publishing and may be subject to change. This record contains information for the most up to date version of the programme / module for the 2024/5 academic year.