COURSE SPECIFICATION DOCUMENT

Academic Department	Science, Innovation & Technology
Programme:	Computer Science
FHEQ Level:	4
Course Title:	Introduction to Computer Networks
Course Code:	COMP 4102

Student Engagement Hours:

Total hours	160 (Standard 4-credit BA Course)
Timetabled Hours	45
Guided Learning Hours	15
Independent Learning Hours	100

Credits:

16 UK CATS credits
8 ECTS credits
4 US credits

Course Description:

This course introduces students to the Introductory concepts of computer networks. It covers wired, wireless, and internet networking technologies, and provides an understanding of how devices communicate within a network. The course will cover key networking models such as the OSI and TCP/IP models, IP addressing, and basic routing. Labs and exercises will help students apply theoretical knowledge to design network solutions and tackle real-world network challenges. By the end of the course, students will be able to design network solutions that meet specific requirements for efficiency, scalability, and security in real-world networking scenarios.

Prerequisites:

None

Aims and Objectives:

By the end of this course, students will:

- Understand the basic principles of computer networking and the components involved.
- Gain knowledge of the OSI and TCP/IP models and their respective layers.
- Develop skills in IP addressing, subnetting, and basic network configuration.
- Understand basic network security principles, including firewalls and Access Control List.
- Apply theoretical knowledge to design network solutions that meet specific requirements for efficiency, scalability, and security.

Programme Outcomes:

CPS L4 AI, BI, CI, DI

A detailed list of programme outcomes can be found in the Programme Specification, available through the Registry at:
https://www.richmond.ac.uk/programme-and-course-specifications/

Learning Outcomes:

By the end of this course, successful students should be able to:

- Understand the types of networks (LAN, WAN, MAN, PAN) and their components.
- Describe the OSI and TCP/IP networking models and explain the function of each layer.
- Apply basic IP addressing and subnetting techniques.
- Configure and manage simple network devices, such as routers and switches.
- Understand the fundamentals of network security, including firewalls and Access Control List (ACL).
- Apply theoretical knowledge to design network solutions that meet specific requirements for efficiency, scalability, and security.

Indicative Content:

- **Introduction to Networking**
    - Overview of network types: LAN, WAN, PAN, MAN
    - Basic network components (NIC, switches, routers)
- **OSI and TCP/IP Models**
    - Layer-by-layer understanding of OSI and TCP/IP models
    - Functions and protocols associated with each layer
- **IP Addressing and Subnetting**
    - IPv4/IPv6 addressing schemes
    - Subnetting and Classless Inter-Domain Routing (CIDR)
- **Network Configuration**
    - Configuring network interfaces
    - Basics of routing and switching
- **Network Security**
    - Firewalls, encryption, and VPNs
    - Common security threats (e.g., malware, DoS attacks)
    - Access Control Lists (ACLs)

Assessment:

The assessment strategy for this course will conform to the University Assessment Norms as approved by the Academic Board.

Details on assessment criteria can be found at:
https://www.richmond.ac.uk/university-policies/

Teaching Methodology:

This course will be delivered face to face through a combination of lectures and interactive sessions. In addition to classroom activities, there are guided learning elements that are tutor led and arranged through Blackboard. These activities can be asynchronous online sessions, flipped classrooms, set readings with discussion boards or set guest lectures for example. Set activities are monitored by the instructor to ascertain student engagement. Students are encouraged to prepare for class and to play an active part, to raise questions, following-up ideas and interact with a wide range of provided material

Indicative Text(s):

Primary Text:

Tanenbaum, A. (2021) *Computer Networks.* 6th edn. London: Pearson.

Additional Texts and Journals:

Fall, K. and Stevens, W. R. (2012) *TCP/IP Illustrated, Volume 1: The Protocols*. 2nd edn. USA: Addison-Wesley.

Hallberg, B. (2015) *Networking: A Beginner's Guide*. 7th edn. USA: McGraw-Hill.

Sadiku, M. N. O. and Akujuobi, C. M. (2022) *Fundamentals of Computer Networks*. USA: Springer International. Available at: Fundamentals of Computer Networks | springerprofessional.de (Accessed: November 2024).

Change Log for this CSD:

Nature of Change	Date Approved & Approval Body (School or AB)	Change Actioned by Registry Services
First edition	Nov 2024	