Module Title	**Principles of Data Networks**
Level	5
Reference No.	CSI_5_PDN
Credits	20
Student Study Hours	Total: 200 Contact hours: 52 Student managed learning hours: 148
Pre-Requisites	None
Co-requisites	None
Excluded combinations	None
Module coordinator	TBC
Division	Division of Computer Science and Informatics
Short Description	This module introduces the principles of data networks, the inter-networked environment, and various technologies related to data networking using experimentation and programming assignments. The module lays the foundations of the data-networking course. It familiarises the students with networking environment, which form the basis of the inter-networked computer infrastructure, as well as with the applications and terminology used in an inter-networked environment.
Aims	The module aims to provide the fundamental principles of data networking that is necessary in an inter-networking environment
Learning Outcomes	**LO1: Knowledge and Understanding** ● Demonstrate an understanding of different components/subsystems and types of computer networks: LAN, MAN, WAN ● Demonstrate a comprehensive understanding of network architectures and their individual protocol layers ● Demonstrate an understanding of selected key topics in computer networks, including recent developments and outstanding issues **LO2: Intellectual Skills** ● Analyse user requirements and select the most appropriate networking and technologies. ● Explains the protocol functions on levels 2-5 of the TCP / IP stack (Maps to: BCS 2.2.1 a1-a5, a7-a9; 2.2.3 a1-a3) **LO3: Practical Skills** ● Set-up a computer Network in a LAN environment ● Monitoring the performance of a computer networks (Maps to: BCS 2.2.1 b1-b4; 2.2.3 a4-a6) **LO4: Transferable Skills** ● Evaluate the data transmission efficiency in communication networks (Maps to: BCS 2.2.1 c1-c2)
Employability	The module aims to equip graduates with concrete knowledge and understanding of the properties and functioning of computer networks including both LAN as used within organisations and the internet. Given that all organisations routinely use both kinds of network expertise in this field is of widely applicable value. Comprehension of LAN and the interrelation to the internet is essential for roles connected with managing the computing infrastructure of both large and small organisations.
Teaching and Learning Pattern	Weekly lectures and PC lab-based tutorials supporting material all available via the VLE.

Indicative Content	● Introduction to Computer Networks ● Network Types: LAN, MAN, WAN ● Computer Network Performance Metrics (Delay, Loss, Throughput) ● OSI and TCP/IP layering architectures ● Introduction to LAN (MAC protocols) ● Ethernet (bridging, switching, VLANs, WiFi) ● IPv4 protocols ● IP Addressing ● IP Protocols (ARP, DNS) ● IPv6 ● TCP, HTTP
Assessment *Elements and weightings*	**EXAM 40% : COURSEWORK 60%** **Summative Assessment** Exam: 2hr paper covering topics from a selection of areas from the module content. (Maps to: BCS 2.2.1 a1-a5, a7-a9; 2.2.3 a1-a3) Coursework: Expected to consist of individual-based coursework using network monitoring and network simulation tools so that students can obtain practical skills in the areas of network protocol analysis and network performance evaluation. (Maps to: BCS 2.2.1 a1-a5, a7-a9; b1-b4; c1-c2 2.2.3 a1-a6) **Formative Assessment** Skills for the summative assessment will be embedded throughout formative opportunities in Lectures and Workshops. Formative assessment will take different forms, such as: ● think-pair-share concept and class discussions ● verbal feedback on tutorial activities ● observation and questioning to provide instant feedback as the student takes part in learning activities
Indicative Sources *(Reading lists)*	**Core:** There is no core textbook defined for this module. Students are expected to refer to the indicative sources below: **Optional:** ● White, C., (2015), Data Communications and Computer Networks: A Business User's Approach, 8th edition, ISBN1305465244 ● William Stallings, 'Data and Computer Communications', Pearson Publishers, 2013 ● Andrew S Tanenbaum, David J. Wetherall, "Computer Networks", Pearson 2013 ● Jame Kurose, Keith Ross, "Computer Networking: A Top-Down Approach (International Edition)", Pearson 2013 ● Larry L. Peterson, Bruce S. Davie, "Computer Networks, Fifth Edition: A Systems Approach (The Morgan Kaufmann Series in Networking) 5th Edition, 2011