Module Guide

Principles of Data Networks

CSI-5-PDN

School of Engineering

L5

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1.   MODULE DETAILS

Module Title:	Principles of Data Networks
Module Level:	L5
Module Reference Number:	CSI_5_PDN
Credit Value:	20
Student Study Hours:	200
Contact Hours:	65
Private Study Hours:	135
Pre-requisite Learning (If applicable):	None
Co-requisite Modules (If applicable):	Noe
Course(s):	BSc(Hons) Computer Science
Year and Semester	2019-2020 Semester 2
Module Coordinator:	Chathura Galkandage
MC Contact Details (Tel, Email, Room)	020 7815 7418, chathurag@lsbu.ac.uk, FW-202
Teaching Team & Contact Details (If applicable):	Chathura Galkandage, Emeka Ugwuanyi
Subject Area:	Computer Science
Summary of Assessment Method:	Coursework, Exam
External Examiner appointed for module:	TBC

2.   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.

3.   AIMS OF THE MODULE

The module aims to provide the fundamental principles of data networking that is necessary in an inter-networking environment.

4.   LEARNING OUTCOMES

4.1   Knowledge and Understanding
- Understand different types of computer networks such as LAN, MAN, WAN and the different components/subsystems they consist of.
- Understanding the basic protocols in the TCP/IP stack

4.2   Intellectual Skills
- Explain the individual component elements of a data network and the differences between various types of networks. Explain the protocol functions on levels 2-4 of the TCP / IP stack.
- Manage the IP addresses in a corporate environment

4.3   Practical Skills
- Set-up a computer Network in a LAN environment.
- Analyse network protocols
- Monitor the performance of a computer network.

4.4   Transferable Skills
Evaluate the efficiency and design of computer networks of diverse types

5. ASSESSMENT OF THE MODULE

Coursework-Lab testing (60%)

Coursework	Additional Information	Issued	Due Date
Lab Test : Network Fundamentals **Weight: 15%**	This is an individual-based test assessment on network fundamentals (network types, encapsulation, overhead, network metrics)	Week 2	Week 7
Coursework : IP Network Evaluation using OPNET and Protocol analysis using Wireshark **Weight: 45%**	This is an individual-based assessment development on IP network evaluation and network protocol analysis. All students must make a 15-min presentation.	Week 5	Week 12

Final Exam (40%)

6. FEEDBACK

Feedback will normally be given to students 15 working days after the final submission of an assignment or as advised by their module leader.

General feedback, applying to all students, will also be placed on the module VLE site within 15 working days.

7. INTRODUCTION TO STUDYING THE MODULE

7.1   Overview of the Main Content

7.2   Overview of Types of Classes

The teaching of this module will consist of two hours lecture each week; two hours workshop/tutorial. The lecture will be in **BR-360** on **Thursdays 4.00pm to 6.00 pm**. The tutorial will be in **FW-206** and **FW-204** on **Fridays 4.00 pm to 6.00 pm**.

7.3   Importance of Student Self-Managed Learning Time

Student responsibility in the learning and development process will be emphasised. Students are required to undertake directed self-study and prepare solutions/discussions to questions relative to various topic areas. Students will be encouraged to identify for themselves particular problems of difficulty and to use seminar discussions, where appropriate, for the resolution of these. Students must regularly access the Moodle site for this module. They should download the class/lecture material from the Moodle site, and do the recommended reading, before each lecture/class.

Where appropriate, students are also expected to download the relevant seminar questions and study them in advance of each seminar, in order to derive maximum benefit from seminar time. The programme of teaching, learning and assessment gives guidance on the textbook reading required for each week, the purpose of which is to encourage further reading both on and around the topic.

7.4   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.

8. THE PROGRAMME OF TEACHING, LEARNING AND ASSESSMENT

SEMESTER 2		
WEEK	**LECTURE SCHEDULE**	**LABORATORY SCHEDULE**
1	INTRODUCTION TO COMPUTER NETWORKS	NETWORK
2	NETWORKING TECHNOLOGY AND NETWORK EVALUATION METRICS	NETWORK PERFORMANCE KPIs
3	PHYSICAL LAYER FUNDAMENTALS	INTRODUCTION TO PACKET TRACER
4	INTEODUCTION TO ETHERNET	PRACTICAL USE CASE: ETHERNET
5	ETHERNET DEVICES	INTRODUCTION TO WIRESHARK
6	INTRODUCTION TO TCP/IP	PRACTICAL USE CASE: ETHERNET DEVICES
7	IP ADDRESSING	LAB TEST, SUBNETTING AND VLSM
8	IP PROTOCOLS (ARP, ICMP, IPv6)	ICMP TOOLS AND IP FFOTPRINTING
9	ROUTING AND L3 DEVICES	PRACTICAL USE CASE: IP
10	TRANSPORT PROTOCOLS (TCP, UDP)	INTRODUCTION TO GNS3
11	APPLICATION PROTOCOLS (DHCP,DNS,HTTP)	IP NETWORK EVALUATION
12	IP SERVICES (Email)	IP SERVICES EVALUATION
13	REVISION CLASSES	PRACTICAL USE CASE: TBC

9. STUDENT EVALUATION
N/A

10. LEARNING RESOURCES
Reading List

William Stallings, Data and Computer Communications, Pearson Publishers, 2013

Andrew S Tanenbaum, David J. Wetherall, Computer Networks, Pearson 2013

James F. Kurose & Keith W. Ross, Computer Networking A Top-Down Approach, 6/E, 2012, ISBN-13: 978-0273768968

Larry L. Peterson, Bruce S. Davie, Computer Networks, Fifth Edition: A Systems Approach (The Morgan Kaufmann Series in Networking), 5th Edition, Morgan Kaufmann, 2011, ISBN 9780123850591