Module Outline

Semester: 07
From January 2020 – May 2020

DCOMP324 – NETWORK DESIGN & MANAGEMENT

MODULE DETAILS

Course Location	: Sierra Leone
Department	: Faculty of Information & Computer Technology
Program Name	: B Sc (Hons) Communication Information Technology
Credits	: 3
Status	: Major
Contact Hours Per Week	: 3 hours (2 hrs lecture + 1 hr tutorial)
No. of weeks (Contact)	: 12 Teaching Weeks + 1 Final Examination Week + 1 Mid Term Break
Teaching Pattern	: Lectures, Tutorials & Presentation
Lecturer's Name	: Gibril Njai
E-mail	: gibril.njai@limkokwingedu.sl

Prepared by : Gibril Njai

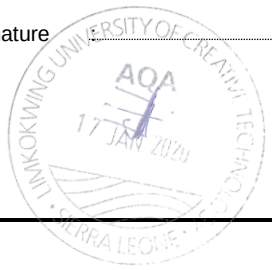
Signature : ..... Date .....

Verified by : Oluwatosin Ayorinde

Signature : ..... Date .....

Approved by : AQA

Signature : ..... Date .....



This document comprises the following:

- Essential Information
- Specific Module Information
- Module Rules & Regulations
- Grades
- Plagiarism
- Module Introduction
- Module Aims & Objectives
- Learning Outcome
- Specific Generic Learning Skills
- Syllabus + Lecture Outline
- References
- Assessment Schedule
- Assessment Criteria
- Specific Criteria
- Learning Activities
- Specific Criteria

Other documents as follows will be issued to you on an ongoing basis throughout the semester:

- Handouts for Assignments
- Submission Requirements + Guidelines

1.0 ESSENTIAL INFORMATION

- All modules other than electives are **'significant modules'**

- As an indicator of workload one credit carries and additional 2 hours of self-study per week. For example, a module worth 3 credits require that the student spends an additional 6 hours per week, either reading, completing the assignment or doing self directed research for that module.

- Submission of ALL assignment work is compulsory in this module, failure to do so a DNS (Did not submit) grade would be awarded. An overall grade of DNC (Did not complete) would be set for those who fail to submit a major piece of assessment work (major assignment i.e.: Class Test, Major Assignment + Final examination). A student cannot pass this module without having to submit ALL assignment work by the due date or an approved extension of that date.

- All assignments are to be handed on time on the due date. Students will be penalised 10 percent for the first day and 5 percent per day thereafter for late submission (a weekend or a public holiday counts as one day). Late submission, after the date Board of Studies meeting will not be accepted.

- Due dates, compulsory assignment requirements and submission requirements may only be altered with the consent of the majority of students enrolled in this module at the beginning/early in the program.

- Extensions of time for submission of assignment work may be granted if the application for extension is accompanied by a medical certificate.

- Overseas travel is not an acceptable reason for seeking a change in the examination schedule.

- Only the Head of School can grant approval for extension of submission beyond the assignment deadline.

- Re-submission of work can only receive a 50% maximum pass rate.

- Supplementary exams can only be granted if the level of work is satisfactory **AND** the semester work has been completed.

- Harvard referencing and plagiarism policy will apply on all written assignments

2.0 SPECIFIC MODULE INFORMATION

- Attendance rate of 80% is mandatory for passing module.

- All grades are subject to attendance and participation.

- Absenteeism at any scheduled presentations will result in zero mark for that presentation.

- Visual presentation work in drawn and model form must be the original work of the student.

- The attached semester program is subject to change at short notice.

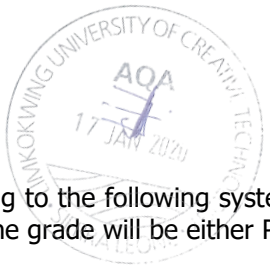
3.0 MODULE RULES AND REGULATIONS:

Assessment procedure:

- These rules and regulations are to be read in conjunction with the UNIT AIMS AND OBJECTIVES

- All assignments/projects must be completed and presented for marking by the due date.

- Marks will be deducted for late work and invalid reasons.
- All assignments must be delivered by the student in person to the lecturer concerned. No other lecturer is allowed to accept students' assignments.
- All tests/examinations are compulsory.
- Students must sit the test/examination on the notified date.
- Students are expected to familiarise themselves with the test/examination timetable.
- Students who miss a test/examination will not be allowed to pass.
- Any scheduling of tutorials, both during or after lecture hours, is TOTALLY the responsibility of each student. Appointments are to be proposed, arranged, confirmed, and kept, by each student. Failure to do so in a professional manner may result in penalty of grades. Tutorials WITHOUT appointments will also NOT be entertained.
- Note that every assignment is given an ample time frame for completion. This, together with advanced information pertaining deadlines gives you NO EXCUSE not to submit assignments on time.



4.0 GRADES

All modules and assessable projects will be graded according to the following system. With respect to those units that are designated 'Approved for Pass/Fail' the grade will be either PX or F:

Grade	***Numeric Grade***	***Description***
90 – 100	A+	
85 – 89	A	Pass with Distinction
80 – 84	A-	
75 – 79	B+	
74 – 70	B	Pass with Credit
65 – 69	B-	
60 – 64	C+	
55 – 59	C	Pass
50 – 54	C-, PX, PC	
0 – 49	F	Fail

EXP	Exempted
PC	Pass Conceded
PP	Pass Provisional with extra work needed
PX	Pass after extra work is given and passed
X	Ineligible for assessment due to unsatisfactory attendance
D	Deferred

W	Withdraw
DNA	Did Not Attend Module
DNC	Did Not Complete Module

5.0 PLAGIARISM, COPYRIGHT, PATENTS, OWNERSHIP OF WORK: STUDENT MAJOR PROJECT, THESES & WORKS

See LIMKOKWING, HIGH FLYERS HANDOUT, pg 10.

6.0 MODULE INTRODUCTION

This course is divided into 2 parts; Network Design and Network Management. In network design, we identify customer business needs; analyze technical goals and then describe their existing network. Students will learn to develop network designs that provide high bandwidth, low delay, high availability, and if time permits high security.
The course covers logical network design topologies, addressing, and protocols. In the latter half of the course, we examine physical network design: selecting topologies and devices followed by testing, optimizing and documenting network.
The end of the course will focus on network management with a focus on network monitoring and event reporting, trouble shooting and problem solving.
This course utilizes Problem Based Pedagogy (PBL) and as such a realistic design and network management business challenge will be addressed by small teams of students who will act as competing network designers who are competing for a network implementation contract based on their proposed design.

7.0 MODULE AIMS AND OBJECTIVES

This module is design to give students an understanding of how to design, manage and secure organizational network. It further examines how network managers and security engineers can strategically use different techniques to capture, collect and analyze network and system data to create a competitive advantage. LAN/WAN design and their management are covered and the use of network monitoring tool is introduced to produce hands on feeling to the students.

8.0 LEARNING OUTCOME

Upon successful completion of this course, students will be able to:.

- Explain the basic concepts of network design and management.
- Examine the basics of network design.
- Explain the basic concepts of network security..
- Describe the tools and applications used for network management.
- Assess the customer requirements and the customer's existing situation
- Design a network addressing plan
- Plan the design implementation
- Explain the network design and its impact to the customer

Tools required 1) Packet Analyzer

9.0 UNIT SYLLABUS + LECTURE OUTLINE:

Week: 1

CHAPTER 1: Introduction to Network Design & Management

Lecture Synopsis:

1.1 Overview of Network Design and Management
1.2 Analysis of goals
1.2.1 Analyzing business goals
1.2.1 Analyzing technical goals and constraints
1.3.1 Scalability
1.3.2 Availability
1.3.3 Performance
1.3.4. Security
1.3.5 Manageability
1.3.6 Usability
1.3.7 Adaptability
1.3.8 Affordability

Week: 2

CHAPTER 2: Characterizing Existing Network Needs

2.1 Developing a network map
2.2 Network Addressing and Naming
2.3 Wiring and media
2.4 Protocol Analyzer
2.4.1 Network availability
2.4.2. Network utilization
2.4.3 Network Efficiency
2.4.4 Analyzing Delay and Response Time
2.5 Network Traffic Load characterization

Handout: *Tutorial 1, Individual Assignment*

Week: 3

CHAPTER 3: Network Topologies And Addressing

Lecture Synopsis:

3.1 Hierarchical, Flat, Mesh network topologies
3.2 Redundant Topologies
3.3 Layer hierarchical model
3.4 Designing Campus and Enterprise Topologies
3.5 Network layer addressing
3.6 Security

Handout: *Tutorial 2*

Week: 4

CHAPTER 4: Protocols & Physical Design

Lecture Synopsis: 4.1 Switching Protocols
4.2 Routing Protocols
4.3 Cable Technologies
4.4.Device Selection

Handout: *Tutorial 3*

Due date: ***Individual Assignment***

Week: 5

CHAPTER 5: Remote Access And Wan Topologies

Lecture Synopsis: 5.1 LAN cabling and technologies
5.2 LAN design Principles
5.3 PPP, Modem, DSL access
5.4 SONET, Frame Relay. ATM
5.5 WAN design Principles
5.6 Selection of Routers and Switches

Handout: *Tutorial 4*

Week: 6

CHAPTER 6: **Network Security Development Strategies**

Lecture Synopsis: 6.1 Basic Concepts of Network Security
6.2 Authentication Techniques
6.3 Access Control
6.4 Network Access Control
6.5 Network Security Protocols

Handout: *Tutorial 5, Major Assignment*

Week 7: Class Test

Week: 8

SEMESTER BREAK

Week: 9

CHAPTER 7: Network Management Strategies

Lecture Synopsis: 9.1 Network Management Design
9.2 Network Management Architecture
9.3 Selecting Network Management Tools and protocols
9.4 Performance Management
9.5 Fault Management

9.6 Configuration Management

9.7 Security Management

Handout: *Tutorial 6*

Week: 10

CHAPTER 8 **Network Management Protocols**

Lecture Synopsis: 10.1 Introduction to SNMP

10.2 SNMP Architecture

10.3 Common Management Information Protocol (CMIP)

10.3 Common Object Request Broker Architecture (CORBA)

Handout: *Tutorial 7*

Week: 11

CHAPTER 9: **Network Management Tools and Engineering**

Lecture Synopsis: 11.1 Sustem Utilities for Management
11.2 Network Statistics Measurement Systems
11.3 MIB Engineering
11.4 NMS Engineering
11.5 Network Management Systems
11.6 Exercises

Handout: *Tutorial 8*

Week: 12

CHAPTER 9: **Network Management Ii**

Lecture Synopsis: 12.1 Telecommunication management Network
12.1.1 Why TMN?
12.1.1 Operation systems, TMN Standards & Architecture
12.1.1 TMN Conceptual Model
12.2 Broadband Network Management
12.2.1 ATM Network Management
12.2.2 Broadband Access Network Management

Handout: *Tutorial 9*

Due date: ***Major Assignment***

Week: 13

Revision

Week: 14
Revision

Week: 15 & 16
FINAL EXAMINATION WEEK

11.0 REFERENCES

Reference Material:

1. Networking Systems Design and Development by Lee Chao, CRC Press; 1st Edition (December 21, 2009). ISBN-10: 142009159X (TB2)
2. Networks: Design and Management by Steven Karris, Orchard Publications (August 2002). ISBN-10: 0970951140
3. Network Design: Management and Technical Perspectives by Teresa C. Piliourasand KornelTerplan, CRC Press (August 19, 1998). ISBN-10: 0849334047
4. Network Warrior by Gary A. Donahue, O'Reilly Media; 2nd Edition (May 13, 2011). ASIN: B004W8ZL3W
5. The Practice of System and Network Administration by Thomas Limoncelli, Christina Hogan, and Strata Chalup, Addison-Wesley Professional; 2nd Edition (July 15, 2007). ISBN-10: 0321492668
6. Network Management: Principles and Practice by Mani Subramanian; Timothy A. Gonsalves and N. Usha Rani, Pearson Education India (2010). ISBN-10: 81-3172759-

12.0 ASSESSMENT SCHEDULE

Assignment description	issue date	due date	%
Assignment	week 2	week 4	10
Lab Exercise	week 3		5
Mid Semester Exams	week 6	week 12	20
Major Assignment			25
FINAL EXAMINATION	week 15	week 16	40
TOTAL			**100**

13.0 ASSESSMENT CRITERIA

Process of grading and criteria used to determine the grades, passes and high distinctions.

14.0 SPECIFIC CRITERIA

- Each assignment will be handed out with the project brief and will vary, depending on the teaching and learning objectives of the specific assignment.