STUDENT ASSESSMENT SUBMISSION AND DECLARATION

Student Name:		Assessor Name:
Issued Date:	Submission Date:	Submitted On:
Program:		
Unit:		
Assignment number and title:		

Plagiarism

Plagiarism is a particular form of cheating. Plagiarism must be avoided at all costs and students who break the rules, however innocently, may be penalized. It is your responsibility to ensure that you understand correct referencing practices. As a university-level student, you are expected to use appropriate references throughout and keep carefully detailed notes of all your sources of materials for material you have used in your work, including any material downloaded from the Internet. Please consult the relevant unit lecturer or your course tutor if you need any further advice.

Student Declaration

Student Declaration

I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.

Student Signature: Date:

ASSESSMENT TRACKING

ASSESSMENT RECORD AND FEEDBACK SHEET					
Program:	HND in Computing	**Student Name:**		**Unit Grade:**	
Unit No. & Title:	02: Networking	**Year:**	2023/2024	**Assessment Date:**	
Assessor Name:	Mr. M.I. Mohamed Nismy	**Unit Completion Date:**		**IV Signature:**	jubailah@bcas.lk

Activity No	Learning Objectives	Criteria Targeted	Date Issued	Hand In Date	Formative Feedback	Resubmission Date*
1.	LO1 LO2	P1 P2 P3 P4 M1	08.05.2024	18.05.2024		
2.	LO2 LO3	P5 P6 M2 M3		25.05.2024		
3.	LO2 LO3 LO4	P7 P8 M4		15.06.2024		
4.	LO1 LO2 LO3 LO4	D1 D2		07.06.2024		
* Resubmissions must be approved by the Assessment Board						

Unit 02: Networking

Assignment Brief

Student Name/ID Number	
Unit Number and Title	**Unit 02: Networking**
Academic Year	2023/2024
Batch / Cohort & Semester	Batch 22, Semester 1
Unit Tutor	Mr. M.I. Mohamed Nismy
Assignment Title	**NetWiz Solutions**
Issue Date	08.05.2024
Submission Date	24.07.2024

Submission Format

Activity 01
A written report

Activity 02
An implementation plan to design a networked system and maintenance schedule for the specified scenario. The report should also include a discussion of a range of server types and a justification of the final selection, along with a test plan and an analysis of user feedback.
The recommended word limit is 1,000–1,500 words, although you will not be penalized for exceeding the total word limit.
You are required to make use of headings, paragraphs, and subsections as appropriate, and all work must be supported with research and referenced using the Harvard referencing system.

Activity 03
A technical report to demonstrate the implementation of the designs for a networked system. The test plan created in the design should also be carried out and the test results recorded.
The recommended word limit is 1,500–2,000 words, although you will not be penalized for exceeding the total word limit.
You are required to make use of headings, paragraphs, and subsections as appropriate, and all work must be supported with research and referenced using the Harvard referencing system.

Activity 04
A written report to evaluate the topology selected for the development of the networked system, as well as an evaluation of the implemented network.
The recommended word limit is 1,000–1,500 words, although you will not be penalized for exceeding the total word limit.
You are required to make use of headings, paragraphs, and subsections as appropriate, and all work must be supported with research and referenced using the Harvard referencing system.

Unit Learning Outcomes

LO1 Examine networking principles and their protocols

LO2 Explain networking devices and operations

LO3 Design efficient networked systems

LO4 Implement and diagnose networked systems

Transferable skills and competencies developed

Students should be able to

- Analyze a network system
- Design a network system.
- Design a test-cases to test a network system.
- Do subnetting.
- Use network simulation tools such as CISCO Packet Tracer or GNS3.
- Analytical Skills.
- Critical thinking

Vocational scenario

NetWiz Solutions is a leading IT solution provider currently situated in one office building containing three departments, namely Marketing, IT Support, and Administration. The company has 58 computers and has decided to divide the network into three subnets. The company has decided to implement a new network infrastructure that will connect all the departments and allow seamless communication and the sharing of resources.

Departments	Networking Devices (Servers, Computers and Printers)
Marketing	20
IT Support	12
Administration	26

The company requires appropriate subnetworks. A Local Area Network (LAN) for each department to share specific Hardware and Software resources. The network should be designed to ensure efficient communication and minimal latency.

As you are a newly joined Junior Network Administrator at NetWiz Solutions, the Chief Executive Officer (CEO) and Senior Network Administrator have asked you to design and build a virtual network solution that will fulfill the company's requirements. This will help the company identify any potential issues in the requirements before spending money on reorganizing the network layout and employee requirements.

In addition, the company wants you to prepare a report for them, showing the range of available networking topologies, protocols, hardware, and software, to prove that you have the breadth of knowledge available to you before you begin the design task.

Assignment activity and guidance

Activity 1

Produce a well-prepared report for the CEO and Senior Network Administrator of NetWiz Solutions that explains the core principles of networks and networking protocols. The report will also include a discussion of the range of network hardware and software available to the systems developer.

Your report should include:

- A discussion of the benefits and constraints of different network types, e.g. wired, wireless, hybrid

- A discussion of the benefits and constraints of different network standards, e.g. OSI, TCP/IP, 802. x
- An explanation of the impact of network topology, communication, and bandwidth requirements, identifying the advantages and disadvantages of each to a network design
- An assessment of common networking principles and how network protocols, e.g. IPv4, IPv6, HTTPS, can enable an effective networked system.
- A discussion of the operating principles of networking devices and network server types, e.g. routers, switches, firewalls, repeaters, bridges, IoT gateways, domain, web, file, and database servers, access permissions
- A discussion of how workstation hardware and the relevant networking software depend on each other.

Activity 2

You are required to design a networked solution for the requirements specified by NetWiz Solutions. You should make use of whichever design tools and techniques are most appropriate for your network and the nature of the networked solution. You should produce your evidence as an implementation plan.

Your implementation plan should include the following.

- The design of the network, including any networking hardware, software, network addresses, devices, and users, including any network sub-domains as well as the physical location of these devices within the organization
- Any device configuration and security considerations should be included, and an IPv4 address should be selected on your own for this purpose.
- The design of a maintenance schedule to support the networked system.
- A test plan covering all areas of the networked system requirements, indicating the test action, test data, and expected results
- Feedback from a range of users on the effectiveness of the solution design
- An analysis of the user feedback to optimize the design and improve the efficiency of the networked solution
- A clear explanation of how the network designs have been optimized and improved
- An explanation of the range of network server types available required by the NetWiz Solutions scenario and a recommended selection
- A justification of the recommended server selection, with a specific focus on cost and performance optimization.

Activity 3

You are required to implement a virtual networked solution for the requirements specified by NetWiz Solutions. You should make use of whichever virtual network simulator is most appropriate for your optimized network design and the nature of the networked solution. You should produce your evidence as a technical report.

Your report should include:

- Clear evidence for the implementation of the optimized design, for example, screenshots, configuration files, annotated and verified demonstration evidence, network monitoring reports
- A test plan implementation, using the test plan designed in Activity 2, clearly documenting the test results against the expected results

- An analysis of the results of the test plan and, based on this, recommendations of potential enhancements for the networked system.

Activity 4

Write an evaluative report for the CEO and Senior Network Administrator of NetWiz Solutions that provides a reflective overview of the selected topology as well as the network design and implementation.

Your report should include:

- An evaluation of network topology and any protocols selected for the given scenario.
- An evaluation of how the topology and protocols demonstrate the efficient use of a networking system
- A critical reflection on the final implemented network and design
- A critical reflection of the decisions made to enhance the network design and the implemented solution.

Recommended Resources
Please note that the resources listed are examples for you to use as a starting point in your research – the list is not definitive.

Textbooks

Burgess, M. (2003) Principles of Network and System Administration. 2nd edn. John Wiley and Sons Ltd.

Donahue, G. A. (2011) Network Warrior 2nd edn. O'Reilly Media.

Goransson, P. Black, C. et al (2016) Software Defined Networks: A Comprehensive Approach 2nd edn. Morgan Kaufmann.

Hallberg, B. (2005) Networking: A Beginner's Guide. 4th edn. Osborne/McGraw-Hill US.

Limoncelli, T. and Hogan, C. (2001) The Practice of System and Network Administration. Addison-Wesley.

Lowe, D. (2005) Networking All-in-One Desk Reference for Dummies. 2nd edn. Hungry Minds Inc.

Olifer, N. and Olifer, V. (2005) Computer Networks: Principles, Technologies and Protocols for Network Design. John Wiley and Sons Ltd.

Stallings, W. (2003) Data and Computer Communications. 7th edn. (Prentice Hall).

Tanenbaum, A. (2002) Computer Networks. Prentice Hall PTR.

Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
LO1 Examine networking principles and their protocols		
P1 Discuss the benefits and constraints of different network types and standards. **P2** Explain the impact of network topology, communication, and bandwidth requirements.	**M1** Assess common networking principles and how protocols enable the effectiveness of networked systems.	**LO1 & LO2** **D1** Evaluate the topology protocol selected for a given scenario and how it demonstrates the efficient utilization of a networking system.
LO2 Explain networking devices and operations		
P3 Discuss the operating principles of networking devices and server types. **P4** Discuss the interdependence of workstation hardware and relevant networking software.	**M2** Explore a range of server types and justify the selection of a server for a given scenario, regarding cost and performance optimization.	

Pass	Merit	Distinction
LO3 Design efficient networked systems		
P5 Design a networked system to meet a given specification. **P6** Design a maintenance schedule to support the networked system.	**M3** Analyse user feedback on your designs to optimize your design and improve efficiency.	**LO3 & LO4** **D2** Critically reflect on the implemented network, including the design and decisions made to enhance the system.
LO4 Implement and diagnose networked systems.		
P7 Implement a networked system based on a prepared design. **P8** Document and analyze test results against expected results.	**M4** Recommend potential enhancements for the networked systems.	

Guidance for Students

Deliverable: Report Should be submitted one **soft copy** of word-processed Report.

NOTE:

- You should include the **COVER PAGE**, **Assessment Declaration form and Unit Review Plan** of this assignment when you submit your final report.
- If submitted after the extended deadline, the assignment will not be accepted whereas you shall be asked to go for a **NEW assignment**.
- Late Submission is not permitted until otherwise recommended by the Assessor /Course Coordinator.
- Plagiarism will be treated as a very Serious academic misconduct.

Instructions to students:

1. All assignment should comprise of the standard **Front Cover** given**. No other front page will be accepted.**

2. **Report Writing Guidelines:**

    1. Every Assignment should have an **Introduction** and **Conclusion.**
    2. The standard **Table of Contents** should be generated.
    3. All the **Figures, Tables, Diagram** etc. should be numbered.
    4. **Main Heading** Font: **Arial**; Size 16
    5. **Sub heading:** Font**: Arial;** Size 14
    6. **Body text:** Font: **Arial**; Size 11
    7. **Paragraph:** 1.5 spacing
    8. **Margins: Top: 1" Bottom: 1" Left: 1" Right: 1"**
    9. **Header –** include the module name on the right hand side
    10. **Footer –** include the page number on the right hand side
    11. All sections should have continuity and pages should be clearly ladled.

References – clear references for all the materials, books, articles, website etc should be given in accordance with Harvard Reference style (Harvard Anglia 2008