

ITKnow Network Design Management Project

BCNS/23A/FT2
BCNS3105C - NDM

This assignment is worth 30% of the total marks for this module. The deadline is on the **23rd July 2025**. You group leader has to email me the assignment in **pdf** format with filename <NDM_ass_group_X.pdf> at **bcns23aft2@rishiheerasing.net**

Objectives

Your group is required to provide a possible network solution for a private educational organisation called **ITKnow**

Business Requirements

ITKnow has just opened up with the aim of offering IT related courses to its students, competing with UTM. It aims to provide student labs, provide computers for its staff and also host its own website. The organisation has a 10 Mbps global IP service with a block of public IP address 202.123.21.120/29 from its ISP.

In terms of infrastructure, the institute shall require the following:

- A server to host the institute's website and also a learning management system (LMS) on which students can access course materials on campus and from home. Each of these should be reachable on **www.itknow.com** and **lms.itknow.com** respectively. All staff should have a personal email address under the institute domain **@itknow.com**.
- The institute wants to set up five computer labs, each containing 20 PCs on static IP addressing, each having restricted internet connectivity. Each computer lab is expected to be on a separate subnet or VLAN.
- Additionally, each classroom should have one PC on DHCP that shall be used by the lecturers. These PCs require unrestricted internet connectivity.
- 2 PCs will be given to the system administrator in the Server Room for network and system management purposes only. Also 3 PCs will be made available for administration and another 3 for teaching assistants (TAs).
***Note:** These 6 PCs should be on static IP addresses and should have internal network access (website and LMS) only.*
- Finally, a wireless access solution should be made available to students over the campus which can allow students internal access to the LMS and web server but with restricted access to the internet. Staff shall have unrestricted access to the Internet. As a single Access Point is unlikely to provide enough coverage and connectivity for all users, you will have to decide how many APs you shall require. Additionally, there should be two wireless networks within the campus: **ITK_public** for guests and students and **ITK_private** for staff. Guests and students will authenticate via a WPA2-PSK common password and staff will authenticate via WPA2-802.1X using a username and password on a RADIUS server.

Your task is to come up with an efficient, robust, scalable and secure network design that will be suitable for this institute. The institute has allowed a capital budget of Rs. 4 million to procure any goods or services that may be required, yet obviously does not want to spend more than necessary.

Deliverables

Build a report giving all the necessary network designs (logical and physical network diagrams should be provided that will allow any technician to build your network structure from scratch). You are free to use any network case tool for the design and this should be incorporated in your report. You also need to provide all configuration information for clients, servers, circuits and devices that you find pertinent in your solution as well as simulation of your solution using Packet Tracer.

Additionally, you will have to perform a cost-assessment and come up with a tentative budget for your solution. Your solution should address any security issues. Best practices should be used wherever possible. Policies might also need to be specified.

ASSESSMENT CRITERIA	
Logical & Physical network diagrams	15%
Software, hardware & network requirements	20%
Network configuration of clients, servers & devices	15%
Cost assessment	15%
Report Format, Research & Referencing	5%
Design and Simulation (Packet Tracer)	15%
Bonus	15%
Total	100 %

Institute Layout

