# **OPTION 1: SYSTEMS ADMINISTRATION**

| <b>Course Name</b>   | : Advanced Routing and Switching                      |
|----------------------|---|
| <b>Course Code:</b>  | BUC3218   |
| <b>Course Level:</b> | 3   |
| <b>Credit Units:</b> | 4   |
| <b>Credit Hours</b>  | : 60  |
| Facilitators         | : Dr Ssentumbwe Male Abdul and Abdallah Ibrahim Nyero |

# **COURSE DESCRIPTION**

Computer networks have transformed the way information is disseminated. Many companies and individuals around the globe send and receive electronic documents, use cloud services and communicate on different social network services. All these premise on the existence of switches and routers.

# **Course Objective**

- To provide students with both theoretical and practical skills in setting up, managing and troubleshooting enterprise networks
- To focuses on in-depth exploration of concepts and configuration of local area networks (LAN), wide area networks (WAN), internet resources and systematic troubleshooting mechanism.

#### **Learning Outcomes**

By the end of this course, the student should be able to;

- Design efficient layer multi-layer network
- Configure VLANs and Routing protocols
- Set-up a secure corporate network to protect the information assets of an organization.

| No. | Торіс                   | Lesson Details                     | Hours |
|-----|-------------------------|------------------------------------|-------|
| 1.  | Layer two Switching     | Configure and verify switch        | 12    |
|     |                         | administration                     |       |
|     |                         | Configure and verify VLANs         |       |
|     |                         | Access ports, VLAN database,       |       |
|     |                         | Normal, extended VLAN, voice       |       |
|     |                         | VLAN                               |       |
|     |                         | Configure and verify trunking      |       |
|     |                         | Configure and verify spanning tree |       |
| 2.  | Infrastructure Security | ➢ Configure and verify switch      | 6     |
|     |                         | security features                  |       |
|     |                         | Configure and verify device        |       |
|     |                         | access control                     |       |
|     |                         | • Lines (VTY, AUX, console)        |       |

#### **Detailed Course Content**

|    |                            | Password encryption  |    |
|----|----------------------------|--|----|
| 3. | Infrastructure Services    | Host redundancy protocols                                      | 12 |
|    |                            | • HSRP, VRRP, GBLP   |    |
|    |                            | Configure and verify IPv4 and IPv6                             |    |
|    |                            | DHCP   |    |
|    |                            | Configure and verify IPv4 Network                              |    |
|    |                            | Address Translation (NAT)                                      |    |
| 4. | Advanced Routing Protocols | Dynamic routing vs Static                                      | 30 |
|    |                            | Routing  |    |
|    |                            | Evaluate routing protocol types                                |    |
|    |                            | • Distance   |    |
|    |                            | • Link state   |    |
|    |                            | • Path vector  |    |
|    |                            | ► RIP  |    |
|    |                            | RIPv2 configuration and  |    |
|    |                            | verification   |    |
|    |                            | Dochet turned  |    |
|    |                            | <ul> <li>Facket types</li> <li>Configure and worify</li> </ul> |    |
|    |                            | • Configure and Verify   |    |
|    |                            | and router types, area types,                                  |    |
|    |                            | <ul> <li>EIGRP</li> </ul>                                      |    |
|    |                            | Packet types   |    |
|    |                            | <ul> <li>Neighbour relationship and</li> </ul>                 |    |
|    |                            | authentication   |    |
|    |                            | • Verify EIGRP   |    |
|    |                            | Introduction to BGP  |    |
|    |                            | • Describe, configure, and                                     |    |
|    |                            | verify BGP peer  |    |
|    |                            | relationships and  |    |
|    |                            | authentication   |    |
|    |                            | • Explain BGP attributes and                                   |    |
|    |                            | best-path selection  |    |
|    |                            | <ul><li>Loop prevention methods</li></ul>                      |    |
|    |                            | • Route tagging and filtering                                  |    |
|    |                            | Split-horizon  |    |
|    |                            | Route poisoning  |    |
|    | Total Hours                |  | 60 |

# Mode of Delivery

- Lectures(face to face and online)
- Demonstrations

# Mode of Assessment

- Course work 30%
- End of semester examination 70%

# **Reading List**

- Kurose, J. F. & Ross, K. W. (2013). Computer Networking (6. ed), Harlow: Pearson Education
- Odom, W., & Wilkins, S. (2017). CCNA Routing and Switching 200-125 Official Cert Guide and Network Simulator Library (1. ed), Cisco Press.
- Wallace, K. (2017). CCNP Routing and Switching ROUTE 300-101 Official Cert Guide (1. ed), Cisco Press
- Hucaby, D. (2015). CCNP Routing and Switching SWITCH 300-115 Official Cert Guide from Cisco Press
- Lacoste, R., & Wallace, K. (2017). CCNP Routing and Switching TSHOOT 300-135 Official Cert Guide (1. ed), Cisco Press.