

SUMMARY OF INFORMATION ON EACH COURSE

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|-----|--|---|---------|
| 1. | Name of Course | Routing and Switching | |
| 2. | Course Code | TRS2251 | |
| 3. | Status of Course [Applies to (cohort)] | Specialisation Core for B.IT (Hons) Data Communications and Networking | |
| 4. | MQF Level/Stage | Bachelor Degree – MQF Level 6 | |
| 5. | Version (State the date of the Senate approval – history of previous and current approval date) | Date of previous version: June 2012 Date of current version: June 2014 | |
| 6. | Pre-Requisite | TCN2141 Computer Networks | |
| 7. | Name(s) of academic/teaching staff | Nazrul Muhaimin Ahmad | |
| 8. | Semester and Year offered | Trimester 2, Year 2 | |
| 9. | <p>Objective of the course in the programme :</p> <p>This course introduces router configuration, advanced LAN switching theory and design, and virtual LANs (VLANs). Topics include router elements and operations, adding routing protocols to a configuration, monitoring IP operations on the router, LAN segmentation, and advanced switching methods. Upon completion students should be able to describe LAN and network segmentation with bridges, routers and switches and describe a virtual LAN.</p> | | |
| 10. | <p>Justification for including the course in the programme :</p> <p>The way a network operates is to connect computers and peripherals using two pieces of equipment - switches and routers. These two let the devices connected to your network talk with each other as well as talk to other networks. Though they look quite similar, routers and switches perform very different functions in a network: Switches are used to connect multiple devices on the same network within a building or campus. The switch would serve as a controller, allowing the various devices to share information and talk to each other. Through information sharing and resource allocation, switches save you money and increase productivity. Whereas, Routers analyze the data being sent over a network, change how it is packaged and send it to another network or over a different type of network. They connect your business to the outside world, protect your information from security threats, and can even decide which computers get priority over others.</p> | | |
| 11. | Course Learning Outcomes : | Domain | Level |
| | LO1 Define and Identify the OSI model layers | Cognitive | Level 1 |
| | LO2 Explain the use of repeaters, routers, and switches to networks | Cognitive | Level 5 |
| | LO3 Apply the basic principles of Local Area Networks (LANs) to different situations | Cognitive | Level 3 |
| | LO4 Configure the routers and switches | Cognitive | Level 5 |

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|--|---|-----------------------|-------|-------|-------|-------|------------------|------------|-----|-----|
| 12. | Mapping of Learning Outcomes to Programme Outcomes : | | | | | | | | | |
| | Learning Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 |
| | LO1 | X | | | | | | | | |
| | LO2 | X | | | | | | X | X | |
| | LO3 | X | | | | | | X | X | |
| LO4 | X | | | | | | X | X | | |
| 13. | Assessment Methods and Types : | | | | | | | | | |
| | Method and Type | Description/Details | | | | | | Percentage | | |
| | Final Exam | Written Examination | | | | | | 50 | | |
| | Test | Written Examination | | | | | | 20 | | |
| | Lab Test | Written and Practical | | | | | | 20 | | |
| Lab Tasks | Routing and Switching Practice | | | | | | 10 | | | |
| 14. | Mapping of assessment components to learning outcomes (LOs) | | | | | | | | | |
| | Assessment Components | % | LO1 | LO2 | LO3 | LO4 | | | | |
| | Final Exam | 50 | 71.43 | 71.43 | 62.50 | | | | | |
| | Test | 20 | 28.57 | 28.57 | 25.00 | | | | | |
| | Lab Test | 20 | | | 12.50 | 33.33 | | | | |
| Lab Tasks | 10 | | | | 66.67 | | | | | |
| 15. | Details of Course | | | | | | | | | |
| | Topics | | | | | | Mode of Delivery | | | |
| | | | | | | | Lecture | | Lab | |
| 1. Introduction The OSI Reference Model; Layered Communication and Connectivity. Connection-Oriented Models. Connectionless Models. Flow Control and Windowing. IEEE Standards. Data Link Addressing. Network Layer Addressing. MAC Addresses Versus Logical Addresses. Network Layer Functions and Internetworking. ANSI Standards. | | | | | | 2 | | - | | |
| 2. IOS—Basic Router Commands Log In on the Console. Entering the Privileged Mode. Router Mode Summary. The IOS Help Facility. Command History and Editing Features. Telnet. Router Passwords. Setting Router Passwords and the Hostname. Understanding the Router Start-up. The setup Command. Enabling IP Routing. | | | | | | 4 | | 4 | | |

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|--|--|---------------------------------------|-----------------------------|-----------|
| 3. Configuration Files and IOS Images | | | | |
| IOS CLI Router-Configuration and IOS File Manipulation. The Trivial File Transport Protocol. Copying Configuration Files to the TFTP Server. Copying from the TFTP Server. | | | 2 | 4 |
| 4. Network Protocols—TCP/IP | | | | |
| The Importance of Subnet Masks. IP Address Classes. TCP/IP and OSI. TCP/IP Transport Layer. TCP/IP Network Layer. IP Addresses and Subnetting. Converting Decimal to Binary. Computing Subnet Masks. Calculating Host Addresses Available. Calculating Subnet Address Ranges. Router Subnet Mask Notation. Configuring IP Addresses | | | 4 | 4 |
| 5. Internetwork Routing | | | | |
| Static Versus Dynamic Routing. Configuring RIP. Viewing RIP Routing Tables and Other Parameters. IGRP. Configuring IGRP. Viewing IGRP Routing Tables and Other Parameters. Router Packet Switching Modes. Distance-Vector Routing Protocols. Link-State Routing Protocols. Multiprotocol Routing. | | | 4 | 2 |
| 6. WAN Protocols | | | | |
| Frame Relay. ISDN/LAPD. Point-to-Point Protocols. HDLC. Frame Relay. Configuring Frame Relay. Frame Relay Encapsulation and DLCIs. Mapping Network Protocol Addresses. Configuring Sub interfaces. Monitoring Frame Relay. Configuring PPP and ISDN. PPP. Configuring PPP. Viewing PPP Statistics. ISDN. ISDN Protocols. ISDN Function Groups. ISDN Reference Points. ISDN Channels. Cisco's Implementation of ISDN BRI. | | | 4 | 2 |
| 7. Access Lists and Network Troubleshooting | | | | |
| Standard IP Access Lists. Complex IP Wildcard Masks. Configuring and Grouping Standard IP Access Lists. Extended IP Access Lists. Configuring Extended IP Access Lists. Monitoring IP Access Lists. Troubleshooting. The show interfaces Ethernet Command. The show interface serial Command. Checking Network Connections. | | | 4 | 2 |
| 8. LAN Design and Segmentation | | | | |
| Ethernet. Fast Ethernet. Gigabit Ethernet. Token-Ring. Network Segmentation and VLANs. Bridges. Switches. VLANs. The Spanning-Tree Protocol. Switching Modes/Methods. IOS CLI Switch | | | 4 | 2 |
| Total | | | 28 | 20 |
| | Total Student Learning Time (SLT) | Face to Face / Guided Learning | Independent Learning | |
| | Lecture | 28 | 28 | |
| | Tutorials | - | - | |
| | Laboratory/Practical | 20 | 10 | |
| | Lab Test | 2 | 4 | |
| | Assignment (Lab Tasks) | - | 10 | |
| | Mid Term Test | 1 | 3 | |
| | Final Exam | 2 | 12 | |

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| | Sub Total | 53 | 67 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | Total SLT | | 120 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16. | Credit Value | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17. | Reading Materials : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Textbooks | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1. CCNA 1 and 2 Companion Guide. Cisco Press. 2004 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2. CCNA 3 and 4 Companion Guide. Cisco Press. 2004 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Reference Material (including 'Statutes' for Law) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1. Joe Habraken, CCNA Routing and Switching, QUE, 2000. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <p>Appendix (to be compiled when submitting the complete syllabus for the programme) :</p> <ol style="list-style-type: none"> 1. Mission and Vision of the University and Faculty 2. Programme Objectives or Programme Educational Objectives 3. Programme Outcomes (POs) 4. Mapping of POs to the 8 MQF domain 5. Summary of the Bloom's Taxonomy's Domain Coverage in all the Los in the format below : <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th rowspan="2" style="width: 15%;">Subject</th> <th rowspan="2" style="width: 25%;">Learning Outcomes (please state the learning Outcomes)</th> <th colspan="3" style="width: 55%;">Bloom's Taxonomy Domain</th> </tr> <tr> <th style="width: 16.5%;">Affective</th> <th style="width: 16.5%;">Cognitive</th> <th style="width: 16.5%;">Psychomotor</th> </tr> </thead> <tbody> <tr> <td rowspan="4">ABC1234</td> <td>Learning Outcome 1</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Learning Outcome 2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Learning Outcome 3</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Learning Outcome 4</td> <td></td> <td></td> <td></td> </tr> <tr> <td rowspan="4">DEF5678</td> <td>Learning Outcome 1</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Learning Outcome 2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Learning Outcome 3</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Learning Outcome 4</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <ol style="list-style-type: none"> 6. Summary of LO to PO measurement 7. Measurement and Tabulation of result for LO achievement 8. Measurement Tabulation of result for PO achievement | | | Subject | Learning Outcomes (please state the learning Outcomes) | Bloom's Taxonomy Domain | | | Affective | Cognitive | Psychomotor | ABC1234 | Learning Outcome 1 | | | | Learning Outcome 2 | | | | Learning Outcome 3 | | | | Learning Outcome 4 | | | | DEF5678 | Learning Outcome 1 | | | | Learning Outcome 2 | | | | Learning Outcome 3 | | | | Learning Outcome 4 | | | |
| Subject | Learning Outcomes (please state the learning Outcomes) | Bloom's Taxonomy Domain | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Affective | Cognitive | Psychomotor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ABC1234 | Learning Outcome 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Learning Outcome 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Learning Outcome 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Learning Outcome 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEF5678 | Learning Outcome 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Learning Outcome 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Learning Outcome 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Learning Outcome 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |