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| <b>Full Title:</b>   | Network Design   |
| <b>Language of Instruction:</b>  | English  |
| <b>Module Code:</b>  | NETW C7027   |
| <b>Credits:</b>  | 5  |
| <b>Valid From:</b>   | Semester 1 - 2016/17 ( September 2016 )  |
| <b>Module Delivered in</b>   | <a href="#">3 programme(s)</a>   |
| <b>Module Description:</b>   | This module provides the student with a system-wide perspective on LAN/WAN design, with an emphasise analysis and techniques for ensuring scalability in networks. The student will be equipped to design enterprise networks that meet a customer's requirements for functionality, capacity, performance, availability, scalability, affordability, security, and manageability. |
| <b>Learning Outcomes:</b>  |  |
| <i>On successful completion of this module the learner should be able to</i>   |  |
| <ol style="list-style-type: none"> <li>1. Identify a customer's needs and objectives</li> <li>2. Analyse both technical and business goals and constraints</li> <li>3. Characterise an existing network and its traffic</li> <li>4. Design a network topology and addressing scheme</li> <li>5. Select the most appropriate switching and routing protocols</li> </ol> |  |

**Module Content & Assessment**

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| <b>Indicative Content</b>  |
| <b>Business Goals and Constraints</b><br>Using a Top-Down Network Design Methodology, Changes in Enterprise Networks, Analyzing Business Constraints                                       |
| <b>Technical Goals</b><br>Scalability, Availability, Network Performance, Security, Manageability  |
| <b>Characterising the existing Network Infrastructure</b><br>Characterising Network Addressing and Naming, Characterising Wiring and Media, Analysing network availability and performance |
| <b>Characterising Network Traffic</b><br>Characterising Traffic Flow, Characterising traffic load and behaviour, Characterising Quality of Service Requirements                            |
| <b>Designing a Network Topology</b><br>Hierarchical Network Design, Redundant Network Design Topologies, Fundamental VLAN Designs, Redundancy and Load Sharing in Wired LANs               |
| <b>Physical Network Design</b><br>Designing Models for Addressing and Numbering, Selecting Switching and Routing Protocols   |

|                                  |          |
|----------------------------------|----------|
| <b>Assessment Breakdown</b>      | <b>%</b> |
| Course Work                      | 30.00%   |
| End of Module Formal Examination | 70.00%   |

**Full Time**

| <b>Course Work</b>     |  |                          |                   |                     |                   |                        |                 |
|------------------------|--|--------------------------|-------------------|---------------------|-------------------|------------------------|-----------------|
| <i>Assessment Type</i> | <i>Assessment Description</i>  | <i>Outcome addressed</i> | <i>% of total</i> | <i>Marks Out Of</i> | <i>Pass Marks</i> | <i>Assessment Date</i> | <i>Duration</i> |
| Essay                  | This assignment is linked to the student's year long project. The object is based on specifying the requirements for their own practical project | 1,2                      | 10.00             | 0                   | 0                 | Week 4                 | 0               |
| Class Test             | Mid Term written test or essay   | 1,2,3,4                  | 20.00             | 0                   | 0                 | Week 10                | 0               |

No Project

No Practical

No End of Module Formal Examination

**Part Time**

| <b>Course Work</b>     |                               |                          |                   |                     |                   |                        |                 |
|------------------------|-------------------------------|--------------------------|-------------------|---------------------|-------------------|------------------------|-----------------|
| <i>Assessment Type</i> | <i>Assessment Description</i> | <i>Outcome addressed</i> | <i>% of total</i> | <i>Marks Out Of</i> | <i>Pass Marks</i> | <i>Assessment Date</i> | <i>Duration</i> |
| Class Test             | Mid Term Exam                 | 1,2,3                    | 30.00             | 0                   | 0                 | n/a                    | 0               |

No Project

No Practical

| End of Module Formal Examination |                               |                          |                   |                     |                   |                        |                 |
|----------------------------------|-------------------------------|--------------------------|-------------------|---------------------|-------------------|------------------------|-----------------|
| <i>Assessment Type</i>           | <i>Assessment Description</i> | <i>Outcome addressed</i> | <i>% of total</i> | <i>Marks Out Of</i> | <i>Pass Marks</i> | <i>Assessment Date</i> | <i>Duration</i> |
| Formal Exam                      | End of semester exam          | 1,2,3,4,5                | 70.00             | 0                   | 0                 | End-of-Semester        | 0               |

| Reassessment Requirement  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|
| <p><b>A repeat examination</b><br/> <i>Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.</i></p> |  |  |  |  |  |  |  |

**DKIT reserves the right to alter the nature and timings of assessment**

**Module Workload & Resources**

**Workload: Full Time**

| Workload Type                 | Workload Description | Hours | Frequency  | Average Weekly Learner Workload |
|-------------------------------|----------------------|-------|------------|---------------------------------|
| Lecture                       | No Description       | 3.00  | Every Week | 3.00                            |
| Tutorial                      | No Description       | 1.00  | Every Week | 1.00                            |
| Directed Reading              | No Description       | 2.00  | Every Week | 2.00                            |
| Independent Study             | No Description       | 2.00  | Every Week | 2.00                            |
| Total Weekly Learner Workload |                      |       |            | 8.00                            |
| Total Weekly Contact Hours    |                      |       |            | 4.00                            |

**Workload: Part Time**

| Workload Type                 | Workload Description | Hours | Frequency  | Average Weekly Learner Workload |
|-------------------------------|----------------------|-------|------------|---------------------------------|
| Lecture                       | No Description       | 2.00  | Every Week | 2.00                            |
| Tutorial                      | No Description       | 1.00  | Every Week | 1.00                            |
| Directed Reading              | No Description       | 3.00  | Every Week | 3.00                            |
| Independent Study             | No Description       | 2.00  | Every Week | 2.00                            |
| Total Weekly Learner Workload |                      |       |            | 8.00                            |
| Total Weekly Contact Hours    |                      |       |            | 3.00                            |

**Resources**

*Recommended Book Resources*

**Priscilla Oppenheimer. 2010, *Top-Down Network Design, 3rd Edition*, 3 Ed., Cisco Press [ISBN: 1-58720-283-2]**

**James Mc Cabe 2007, *Network Analysis, Architecture, and Design, Third Edition*, 3 Ed. [ISBN: 0-08-054875-X]**

*This module does not have any article/paper resources*

*This module does not have any other resources*

**Module Delivered in**

| <b>Programme Code</b> | <b>Programme</b>                                   | <b>Semester</b> | <b>Delivery</b>  |
|-----------------------|--|-----------------|------------------|
| DK_KCOMP_7            | <a href="#">Bachelor of Science in Computing</a>   | 5               | Group Elective 3 |
| DK_KCENW_7            | <a href="#">Certificate in Computer Networking</a> | 2               | Elective         |
| DK_KCENW_7            | <a href="#">Certificate in Computer Networking</a> | 1               | Elective         |