# Solent University Module Descriptor

## **Module Code:** COM414 **Module title: Routing and Switching**

### **Why is this module important?**

As enterprises migrate toward controller-based architectures, the role and skills required of a core network engineer are evolving and more vital than ever. To prepare for this network transition the module will not only prepare you with the knowledge of foundational technologies, but ensure you stay relevant with skill sets needed for the adoption of next generation technologies.

### **What you will learn on the module**

We will start with connecting together real network equipment in the advanced network lab. You will install and configure network components, including switches and routers and firewalls. You will apply structured approaches to troubleshooting network issues in hardware, software products and the network services. You will communicate effectively with colleagues in your cohort while building the networks in teams. You will apply diagnostic tools and techniques to identify the causes of network performance issues developing analytical skills and understand and apply the maths required to be a network engineer. You will gain knowledge of static and dynamic routing protocols and switching concepts by studying online reading and interactive materials. You will practice implementing, verifying, and troubleshooting routing operations using static and dynamic routing .You will perform LAN design tasks and switch configuration to understand virtual LANs and how to interconnect them and route between them.

### **How you will learn**

You will learn about this technical subject by doing activities, you will learn by actually creating networks. Both in a network simulation environment and with physical laboratory equipment that allows you to create a network with an almost unlimited number of devices, encouraging open practice, discovery, trouble-shooting and the use of analysis tools

This is reflected in the laboratory sessions where you will use physical network devices and interconnect them with computer hardware configure them, investigate and solve problems, monitor performance. You will progress from structured, easy-to-follow tasks to more advanced activities that build critical thinking and problem-solving skills and encourage exploration and research.

The online learning environment for this course includes highly interactive e-doing activities that help stimulate learning and increase knowledge retention. Consisting of rich multimedia content, including interactive graphical activities, videos, games and quizzes these address a variety of learning styles and will help you prepare for and extend the activities undertaken in formal teaching sessions.

### **How much time the module requires**

For a 20 Credit module you are expected to study for 200 hours (which equates to 10 hours per credit.  This total learning time is made up of contact time, directed learning tasks, independent learning and assessment activity. Your tutor will offer you guidance on how you should best manage your study time on this module

### **How you will be assessed**

**Tasks which help you to learn and prepares you for summative tasks (Formative):**

Quizzes, e-activities, classroom interaction and computer lab work provide formative feedback opportunities allowing you to gauge and monitor your progress through the learning experience. The questions in quizzes will be in the same format and on the same topics as the Multi choice answer test.

The practical lab work will prepare you for the Time constrained assignment TCA and also using a simulator with feedback on progress for structured activities.

#### **Tasks which count towards your degree (Summative):**

1. Complete a Multi-choice answer (MCA) test in class to assess your knowledge of the models of computer networking. To specify the various network protocol uses, structures of data, and methods of addressing. To assess your ability to calculate ranges of addresses using the appropriate mathematics. To identify relevant network applications and services. To give examples of configuration of network devices and how you monitor and manage network device configuration and operation.
2. Complete a time constrained assignment (TCA) in class which will include designing and configuring a medium sized network with network devices applying network routing optimisation and access control.

#### **When assessment does not go to plan**

The reassessment will be retaking the MCA test and TCA in the same format at the next available resit point.

### **What you will be able to do after the module**

1. Design install and configure a medium complexity computer network using routers and switches and associated network protocols.
2. Define the characteristics of LAN / VLAN / Routing protocols methods and technologies
3. Use analytical and problem-solving skills to design implement simulate test and troubleshoot computer networks
4. Plan with a thorough and organised approach how you are going to implement a working solution in a limited time.

### **How this relates to the dimensions of Solent’s Real-world curriculum framework**

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| --- | --- | --- |
| **Dimensions** | **How students learn** | **How students are assessed** |
| Students are challenged to think in critical, creative and applied ways | Practically building networks will allow you to apply skills in an interesting and engaging scenario. | The skills assessment will assess your ability to be creative and apply your knowledge and skills |
| Students are inspired to do research through inquiry, curiosity and problem-solving | The online activities are based around solving problems and the classroom activities are related to connecting real networks with real equipment. | You will be provided with feedback on your activities in the class both in the simulator and when you construct real networks |
| Students experience an intellectually stimulating curriculum which inspires them to learn for life | The certification program is part of a lifelong learning strategy created by network professionals endorsed by Cisco | The MCA assessment is preparation for industry based certifications with similar questions |

### **Summative assessment details**

|  |  |  |
| --- | --- | --- |
| AE1 | Weighting: | 50% |
|  | Assessment type: | MCA test |
|  | Aggregation: | Aggregated to AE2 |
|  | Length/duration: | 90 mins |
|  | Online submission: | No |
|  | Grade marking: | No |
|  | Anonymous marking: | Yes |

|  |  |  |
| --- | --- | --- |
| AE1 | Weighting: | 50% |
|  | Assessment type: | TCA |
|  | Aggregation: | Aggregated to AE1 |
|  | Length/duration: | 110 mins |
|  | Online submission: | No |
|  | Grade marking: | No |
|  | Anonymous marking: | No |

### **Module Author:**

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| --- | --- | --- | --- |
| Module Title: Routing and Switching | | | |
| Credit Points: | 20 | Module Code: | COM414 |
| FHEQ Level: | 4 | School/Service | SMAT |
| Module Delivery Model: | CD | Max/Min student numbers | 25 |
| Module Leader: | Warren Earle | | |
| HECOS code | 100365 | | |

### **Module change history:**

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| --- | --- | --- | --- |
| Module Approved/Year Implemented/Code | July 2019 | 2020/21 | COM414 |
| Module modified/Year Implemented/Code |  |  |  |
| Add extra rows as required |  |  |  |