# Solent University Module Guide

## **Module code: COM516 Module title: Network Implementation**

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

Computer Networks can rightly be called the backbone of any business. Business and industry need experts with practical and theoretical knowledge of computer networks to design, implement and test computer networks to meet the business requirements. Troubleshooting and configuration is a fundamental requirement to run any computer network smoothly. This module aims to equip students with the necessary employable knowledge and practical skills to design, implement and test computer networks to meet a company’s requirement. This would allow students the career progression within various network engineering roles.

### **What you will learn**

This module uses a real world case study, involving several interconnected sites, to consider the design and practical implementation of computer networks and services to meet the needs of modern businesses. You will investigate the design of the network and its address space, the configuration of network hardware, for example, routers, and network services, such as web servers. Throughout the delivery period, you will learn how a complete solution can be developed and implemented to meet the requirements of the case study. This will involve Local Area Network (LAN) components of the network interconnected to form a Wide Area Network (WAN). The case study would play an important role in allowing you to develop a complete picture of how computer networks function and are configured. Specifically, you will learn the following topics in this module:

**Network Structure and Design**: The phases involved in the implementation of computer networks, including requirements analysis, design, implementation, and testing. Planning the address space and address conservation techniques, e.g., subnetting and Network Address Translation, IPv4 versus IPv6 issues, Designing and drawing network diagrams, for example using Cisco Packet Tracer. Modelling network designs using simulation software, for example using Opnet.

**LAN and WAN Technologies:** Interconnection and configuration of network devices such as routers and switches. The interconnection of LANs by means of WAN technologies, including the Internet, whilst ensuring the security of data in transit, for example, VPNs.

**Implementing Computer Networks:** Practical and theoretical issues involved in the implementation and configuration of computer network systems and services in the real world, for example, DNS and DHCP. Implementing web servers and Internet services, for example, IIS or Apache.

**Troubleshooting, Monitoring, and Management:** Issues and techniques for troubleshooting, monitoring and managing computer networks. Troubleshooting tools, e.g., ipconfig, tracert, pathping, nslookup, wireshark.

### **How you will learn**

The teaching and learning strategy for this module will be based on a real world case study based on a typical modern business, involved in e-commerce, and with several offices at various sites. This scenario will give scope for the full range of computer network systems and services necessary to support a typical enterprise.

You will be introduced to the theoretical concepts in the preparation sessions. You will use those theoretical concepts to investigate the solution to meet requirements of the case study. Once you have an understanding of the theory and have designed the solution, you will start work in groups, implement the solution in a practical workshop in order to meet the requirements of the scenario. We have adopted student centred approach in which you will realise the implementation of solutions by means of directed learning. You will be expected to maintain a self-managed logbook or notes that you will use as background material for summative assessment.

To support learning in this module, you will encounter a range of learning opportunities involving classroom and lab based activities. The Virtual Learning Environment (VLE), the Solent Online Learning (SoL), will be used to provider additional resources, such as videos and links to other material.

### **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 study 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**

There will be two summative assessments and the marks for each element of assessment will be aggregated to produce an overall mark for the module.

There will be opportunities for formative assessment throughout the study period. You would be able to get formative feedback in both preparation and practical sessions. Also, there would be a dedicated formative feedback session for AE1 set a couple of weeks ahead of the submission deadline to allow you time to refine your submission.

You will be expected to take notes during preparation sessions and practical laboratories that would help in the summative assessments, though this will not directly form part of the assessment.

For the first summative assessment, you will be expected to develop a technical training package. This is based around the case study mentioned above that could be used to teach the subject of network implementation to a professional audience. The training package will be delivered in the form of a report. This will include notes that introduce each topic within the subject. Also, the context of the scenario, and reference supporting material such as presentation slides, speaker notes, figures, quizzes, and other innovative material, for example, videos of practical tasks will be provided.

The second summative assessment will consist of a practical time-constrained assignment (TCA). This will employ simulation software to enable students to design and draw a diagram of a computer network according to a given scenario and configure the network devices and server services on the network. The TCA will be open book. The output of this assessment will be the network diagram, device and server configurations and answers to questions about observations made during the TCA.

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

* Referral in AE1 will require revision and resubmission of the report and supporting evidence in the light of tutor feedback. Laboratory access may be required to obtain data and other evidence to support this.
* Referral in AE2 will require the student to retake the TCA based on the use of simulation software.

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

1. Discuss the issues involved in the design and implementation of computer networks in real life (Knowledge and Understanding).
2. Design, implement, configure and troubleshoot a computer networking solution to meet the needs of business (Practical and Professional).
3. Evaluate solutions for a given computer networking problem (Cognitive Skills)
4. Identify and address any legal, social, ethical and professional issues involved in the proposed solution (Practical and Professional).
5. Present complicated technical information clearly using a range of different communication media (Transferable Skills).
6. Work effectively in collaboration with others (Transferable Skills).

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

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| Dimensions | How students learn | How students are assessed |
| Students are challenged to think in critical, creative and applied ways | Students will be working on a real-world case study. They will apply the concepts and theories, they learnt about computer networks, to design a solution to a practical problem to meet customer’s requirements. | Students document and present their solution in the technical training package. The practical skills required to implement the proposed solution to the case study are demonstrated and assessed in the time constrained practical test. |
| Students are inspired to do research through inquiry, curiosity and problem-solving | Students explore solution to a given problem by doing guided research in the preparation sessions and independent research in their own time. The problem-based learning approach creates curiosity and engagement in research. | Students link the research findings to the solution and cite the references in the proposed solution. The research findings are reported in the technical training package and this becomes part of the marking criteria. |
| Students experience an intellectually stimulating curriculum which inspires them to learn for life | Students explore state of the art technological solution to an authentic real-world problem which keeps them intellectually stimulated. Students learn how computer networks technology can help business and enterprise optimize their operations and boost economy. This develops independent life-long learning skills among students. | Students will use their research to inform and optimise the solution. |

### **Summative assessment details**

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| AE1 | Weighting: | 60% |
|  | Assessment type: | Report (Technical Training Package) |
|  | Aggregation: | Aggregated to AE2 |
|  | Length/duration: | 2500 words (excluding appendices) |
|  | Online submission: | Yes |
|  | Grade marking: | Yes |
|  | Anonymous marking: | No |

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| AE2 | Weighting: | 40% |
|  | Assessment type: | Class Test (Time Constrained Assignment) |
|  | Aggregation: | Aggregated to AE1 |
|  | Length/duration: | 1.5 hours – open book |
|  | Online submission: | Yes |
|  | Grade marking: | No |
|  | Anonymous marking: | No |

### Module Author: Shakeel Ahmad

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| Module Title: Network Implementation | | | |
| Credit Points: | 20 | Module Code: | COM516 |
| FHEQ Level: | 5 | School/Service | SMAT |
| Module Delivery Model: | CD | Max/Min student numbers |  |
| Module Leader: | Shakeel Ahmad | | |
| HECOS code | 100365 | | |

### Module change history:

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| Module Approved/Year Implemented/Code | July 2019 | 2020/21 | COM516 |
| Module modified/Year Implemented/Code |  |  |  |
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