# Solent University Unit Descriptor

## **Unit Code: COM413 Unit title: Network Applications**

### **Why is this unit important?**

A computer network has no reason for existence without traffic in the form of data flowing from a source to a destination. The traffic may be generated by an application accessing data on the network where the source may be a server or other computing device and the destination may be other computers attached to the network. Whilst it is important to understand how the physical part of the network functions in the form of network devices such as routers and switches and media in the form of cabling, it is also essential to understand the logical part of the network where the network traffic is generated. Computers and other devices require an operating system that allows applications to run and communicate and the network as a whole needs various services to facilitate communication and access to shared resources. Networks services must be resilient and be able to handle large numbers of clients when required. This unit investigates the function and management of operating systems and the services that run on networks to facilitate this communication between systems. It also looks at how resilience and availability of systems and services can be provided and the consequence of system failures if these factors are not properly accounted for.

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

**Network Operating Systems, Virtualisation and Cloud Services**

You will be able to compare and contrast the basic features of various network operating systems, such as Windows versus Linux. You will learn about server roles and server types. There will be a basic introduction to the concept that devices like routers, switches and smartphones have an operating system. You will be introduced to the concept of virtualisation of operating systems and the terms Network Function Virtualisation and Software Defined Networks. The basic concepts of cloud services will be introduced.

**Server Roles, Applications and Administration**

You will be introduced to the key aspects of networkconfiguration and administration of important network operating system services and features, for example directory services, and configuring server roles and features. You will also be introduced to the basic concepts of the various services that servers provide to support access to the network such as for Domain Name System (DNS), sharing files, providing access to databases and email.

**Resilience and Reliability**

You will be introduced to causes and impacts of basic hardware failures, for example disk, CPU and power and how environmental problems can affect systems. The concepts of fault tolerance will be introduced, for example using RAID arrays to provide protection against single disk failure or providing duplicate server roles. We will also look at the concepts of disaster recovery, including backup strategies and methods and business continuity. You will be introduced to the basic concepts of load balancing in order to provide reliable access to shared resources on a large scale. We will investigate the effects of a lack of storage, memory and CPU on the efficient running of operating systems.

**Users and File Systems**

You will investigate the basics of security starting with an introduction to user level and file system security. Common files systems will be introduced, for example NTFS, and how access to them is shared over a network, for example SMB. You will be introduced to the concepts of distributed files systems such as DFS, NFS and also Network Attached Storage.

**Introduction to Command Line Scripting**

Scripting is important in managing most operating systems, including Linux and Windows and you will learn basic concepts of shell and command line scripting in the automation of operating system administration. Not all operating systems have a Windows like interface and you will be introduced to the concept of the command line operating system. Introduction to simple scripting and programming concepts relevant to computer network applications.

### **How you will learn**

A real-world case study will be introduced that will illustrate the relevance of the subject to the needs of business and industry. During preparation sessions you will study the customer requirements within the case study and under guidance you will investigate solutions that you will apply in theory and in practice when you engage in practical workshops in the laboratory. A student-centred approach will be adopted in which you will realise the implementation of solutions for yourself by means of directed learning.

Throughout the semester you will also work and research on a topic of your own choosing from a provided list of topics. The concepts should be applied to the case study. The outcomes of this work may either be a theoretical or a practical solution related to the theme of your topic. Towards the end of the semester you will showcase the outcomes of your work in a presentation session.

This means that you will have a basic understanding of the operating systems and services used on a computer network to meet the needs of a business case study and also of the issues that present risks to normal operation of these systems.

### **How much time the unit requires**

You will need to attend and engage in timetabled practical workshops and tutorials for this unit. You will also need to engage in an additional amount each week of directed and independent learning outside of these sessions in order to work towards proficiency in this subject. This will include work on preparing evidence for your portfolio and researching and preparing for a presentation.

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

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

You should maintain a Personal Learning Record each week and show it to your tutor at regular intervals during the timetabled sessions for feedback in order to maximise your marks when you submit it. This should consist of a commentary on each topic and evidence that you have applied relevant technology to the needs of the case study in theory, based on your research and preparation, and in practice, based on your practical laboratory work. Your tutor will be able to give guidance on your weekly progress based upon this account.

You should also work on a topic for a presentation and at regular intervals you should seek advice and feedback on your progress in developing this to a proficient standard that meet the criteria of the topic in question.

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

The first summative assessment is based on a Personal Learning Record. The Personal Learning Record will contain a weekly commentary on the topic in question and evidence of how you have applied the relevant technology to the needs of the case study in theory, based on your research and preparation, and in practice, based on your practical laboratory work.

For the second summative assessment, you will engage in research on a topic throughout the semester. You will then present the outcomes of your work to the tutor and other students during a presentation session towards the end of the semester. You will be assessed on the suitability of your solutions to meet the objectives of your chosen topic. The solutions should relate to a given scenario, for example basic implementation of a directory service for a company, or a script that can be applied to network administration for a particular purpose within a company. Solutions may be practically or theoretically demonstrated.

#### **When assessment does not go to plan** If you have not completed your Personal Learning Record to a standard satisfactorily enough to pass the unit you will be expected to conduct preparation and practical work based on the original assessment and to submit a Personal Learning Record completed to at least a satisfactory standard according to the assessment criteria.

If you did not pass the presentation part of the assessment for this unit you will expected to prepare a presentation and present it during the resit period on a given date so that it meets at least a satisfactory standard according to the presentation criteria.

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

1. Understanding of the architecture required to implement IT systems to meet a business’ needs.
2. Understanding of the types of systems failures and their consequences, and responding appropriately.
3. Evaluate information and use this to investigate problems and evidence solutions.
4. Implement a range of specialised technical skills at a basic level, with some guidance.
5. Communicate and present information, data and ideas effectively, technical writing, and referencing sources accurately.
6. Recognise risks and safety issues for safe operation of computer systems

### **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 | Students research solutions to a case study and implement them practically in a workshop | A personal learning record that discusses their approach to theoretical and practical solutions to a problem |
| Students are inspired to do research through inquiry, curiosity and problem-solving | Students are tasked with investigating a topic and preparing theoretical solutions | Students will present the results of their research and application of solutions |
| Students experience an intellectually stimulating curriculum which inspires them to learn for life | Students will engage in workshops that will simulate real life problem solving within a realistic business environment | Students will present evidence of solutions to the requirements of real life problems |
| Students reflect and grow inwardly, socially and ethically to be able to confront the challenges of the world | Students will acquire skills in promoting themselves as a practitioner | Students will be required to show evidence of how they have engaged in developing solutions for case studies |
| Students face outward to the community, industry and the global environment | Students will need to have an awareness of the need for engagement with business and industry with every opportunity presented | Students will need to reflect evidence of feedback they have gained from engagement for both formative and summative assessments |
| Students learn from authentic, engaging and programmatic assessment | Students will be exposed to current practices and technology in developing solutions to problems | Students should present their solutions based upon current practice and technology |

### **Summative assessment details**

|  |  |  |
| --- | --- | --- |
| AE1 | Weighting: | 60% |
|  | Assessment type: | Personal Learning Record |
|  | Aggregation: | Aggregated to AE2 |
|  | Length/duration: | 2000 words plus appendices |
|  | Online submission: | Yes |
|  | Grade marking: | Yes |
|  | Anonymous marking: | No |

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| --- | --- | --- |
| AE2 | Weighting: | 40% |
|  | Assessment type: | Presentation |
|  | Aggregation: | Aggregated to AE1 |
|  | Length/duration: | 10 minutes plus 5 minutes Q&A |
|  | Online submission: | No |
|  | Grade marking: | Yes |
|  | Anonymous marking: | No |

### **Unit Author:** Neville Palmer

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| Unit Title: Network Applications | | | |
| Credit Points: | 20 | Unit Code: | COM413 |
| FHEQ Level: | 4 | School/Service | SMAT |
| Unit Delivery Model: |  | Max/Min student numbers | 25 |
| Unit Leader: | Neville Palmer | | |
| HECOS code | 100365 | | |

### **Unit change history:**

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| --- | --- | --- | --- |
| Unit Approved/Year Implemented/Code | July 2019 | 2020/21 | COM413 |
| Unit modified/Year Implemented/Code |  |  |  |
| Add extra rows as required |  |  |  |