# Solent University Module Descriptor

## **Module Code: COM512 Module title: Network Security**

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

Computer networks are the entry point for traffic into IT systems. It is important to distinguish between legitimate traffic associated with the normal operation of an organisation from harmful traffic associated with malicious activity. Whilst it is important to understand the attack vectors and mechanisms through which malicious traffic enters the network it is also essential for a network engineer, cyber security or other IT specialist to understand the principles involved in mitigating against this. This may involve a combination of systems used to provide a defence in depth approach to security. This module covers the progression from network planning to implementation of security mechanisms on computer networks. It covers the techniques, hardware and software systems that can be applied as counter measures to security threats. The module will investigate the theoretical concepts of network security and the application of these to the design of secure networks

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

You will be introduced to the following topics on the module:

* **Vulnerabilities, Threats, and Attacks -** The concepts of security threats will be introduced, using examples, to illustrate vulnerabilities, threats, and attacks to networks.
* **Security Planning and Policy -** The principles of network security policies, network protection and management mechanisms and security architectures
* **Security Devices -** Securing access to a network using appliance-based, server-based, and integrated firewalls.
* **Trust and Identity Technology -** Authentication, Authorisation, and Accounting Technologies to improve access to networks and devices and to log access.
* **Intrusion Detection and Prevention Technology -** Overview and configuration of intrusion prevention and detection systems.
* **Encryption and VPN Technology -** Encryption types and integrity basics for networks. Using and configuring Virtual Private Networks to secure connections over insecure networks.
* **Secure Network Architecture and Management -** Developing security best practices, managing and auditing security of networks.
* **Security Appliance Contexts, Failover, and Management -** Configuring security devices to enable management and secure failover.

### **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. A student-centred approach will be adopted in which you will realise the implementation of solutions for yourself by means of directed learning. This will culminate in applying your solutions to a complete system.

**How much time the module requires**

You will need to attend and engage in 4 hours per week of timetabled practical workshops and tutorials for this module. You will also need to engage in an additional 12 hours 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 research and preparing evidence for your report and solutions to your case study.

**How you will be assessed**

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

You should maintain a record of solutions to a case study based on theoretical preparation and practical exercises. You should show this to your tutor at regular intervals. You should also complete the online chapter tests to obtain further feedback on your progress.

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

The summative assessment is based on a critical evaluation report. In the report you must record an evaluation relating to each topic and evidence of how you have applied relevant technology to the needs of the case study in theory, underpinned by your research and preparation, and in practice, based on your practical laboratory work.  This should be properly referenced.

For the second summative assessment, you will take a time constrained assignment consisting of theoretical questions and practical tasks that apply security solutions for a given scenario.

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

If you did not pass the time constrained assignment part of the assessment for this module you will expected to take a new time constrained assignment similar to the original one at a data and time allocated for this purpose.

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

### Discuss the issues involved in the design and implementation of computer network security systems.

### Investigate components and mechanisms involved in securing networks.

1. Evaluate the requirements for a secure computer network.
2. Implement security mechanisms to protect computer networks from internal and external threats.

### **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 critical evaluation report that discusses their approach to theoretical and practical solutions to a problem, and a time constrained assignment in which solutions are applied |
| 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 discuss the results of their research and application of solutions in a critical evaluation report and applied in a time constrained assignment |
| 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 provide evidence of solutions to the requirements of real-life problems documented in a critical evaluation report and a time constrained assignment |
| Students reflect and grow inwardly, social and ethically to be able to confront the challenges of the world | Students will acquire skills in promoting themselves as a professional practitioner | Students will be required to show evidence of how they have engaged in a professional manner with the process of developing solutions for case studies |
| Students face outward to the community, industry and the global environment | Students will acquire skills to secure IT networks, accounting for all relevant factors within an organisation | Students will need to show evidence of feedback and evaluation in developing solutions to real world problems in both formative and summative assessments |
| Students learn from authentic, engaging and programmatic assessment | Students will be exposed to current industry practices in developing solutions to real world problems | Students should present their solutions based upon current practice and technology |

### **Summative assessment details**

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| --- | --- | --- |
| AE1 | Weighting: | 60% |
|  | Assessment type: | Report |
|  | 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: | Time Constrained Assignment |
|  | Aggregation: | Aggregated to AE1 |
|  | Length/duration: | 2 hours |
|  | Online submission: | No |
|  | Grade marking: | No |
|  | Anonymous marking: | No |

### Module Author: Neville Palmer

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| --- | --- | --- | --- |
| Module Title: Network Security | | | |
| Credit Points: | 20 | Module Code: | COM512 |
| FHEQ Level: | 5 | School/Service | SMAT |
| Module Delivery Model: | CD | Max/Min student numbers | 25 max |
| Module Leader: | Neville Palmer | | |
| HECOS code | 100376,100365 | | |

### Module change history:

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| --- | --- | --- | --- |
| Module Approved/Year Implemented/Code | July 2019 | 2020/21 | COM512 |
| Module modified/Year Implemented/Code |  |  |  |
| Add extra rows as required |  |  |  |