# Ravensbourne University London

| Unit Title | Computer Networks and Technology (blended) |
|---|---|
| FHEQ  Level | Level 4 |
| Unit Code | CLC20102 |
| Credit Value | 30 |
| Unit Type | Subject |

| Learning Hours (Blended) | | | |
|---|---|---|---|
| **Staff – Student Contact Hours** | | **Independent Study Hours** | |
| Classes | 60 | Independent study and unsupervised access to resources | 170 |
| Supervised access to Ravensbourne resources | 30 | Preparation for assessment | 40 |
| **Total** | | | 300 |

## Unit Description

This unit aims to provide an understanding of computer network technologies and modern-day technology being used by the industry including various types of computing devices, network hardware, operating systems, protocols and standards. The complex world of internet is comprised of smaller networks which are linked together and make communication around the globe possible.

With the aid of Local Area Networks and the Internet, organisations and individuals communicate with each other using e-mails, VOIP and Video conferencing. This unit will explore these technologies and their uses within the business context.

Students will learn the basics of computer technology such as basic components of computer hardware and software. Moving on to more advanced topics, students will learn about computer networks, cabling standards, network topologies up to setting up and troubleshooting a complete network by configuring routers and switches. Students will have access to CISCO academy resources along with AWS specific knowledge areas which will enable them to develop a 360-degree understanding of local network infrastructure used within the organisation or at a data centre.

Students will be able to appreciate and evaluate configuration of a Local Area Networks and Wide Area Networks including IP addressing and subnetting. Students will also learn about how to establish secure connection between different networks and potential vulnerabilities which may expose them to cyber-attacks.

This unit will play a key role in establishing the foundations for upcoming modules in Cloud Computing and Cyber Security courses. The course will also look at the internet and web technologies.

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The Five Principles underpin the Mindsets and Skillsets Manifesto and are the foundation upon which all course curriculum frameworks and unit specifications are based. The relevant Principles as stated below have been mapped against the Learning Outcomes relevant to each course unit and at each level (see Programme Specifications for full description of the Five Principles):

1. Cultivate / Where the individual thrives.
2. Collaborate / Where disciplines evolve.
3. Integrate / Where education engages industry.
4. Advocate / Where purpose meets practice.
5. Originate / creativity meets technology.

## Unit Indicative Content

### Industry-wide Knowledge
- Introduction to computer hardware and Operating Systems
- Different types of networks and their role
- Networking hardware, servers, routers, switches and cabling
- OSI Model
- IP Addressing and Subnetting
- Network services
- Topologies and Protocols
- Wireless technologies
- Network Optimisation
- Command Line Tools
- Network Security
- Network Management and Troubleshooting

### AWS Specific Knowledge Area
- Introduction to AWS
- EC2

### CyBOK knowledge areas

- Hardware Security

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## Unit Aims

1. To demonstrate knowledge of the Computer Networks, Network Operating Systems and identify the uses of typical hardware and software components in a network.

2. To select suitable equipment and protocols for use in a network, diagnose problems and propose solutions in equipment selection, protocol use and configurations.

3. To demonstrate knowledge in Network Operating Systems and Directory Services

4. To demonstrate understanding of Hardware Security and Cyber-Physical System Security

5. To analyse and design IP addressing schemes for a network.

## Unit Learning Outcomes

LO 1 Research/Inspiration Demonstrate your capacity for information gathering techniques using a wide range of sources, providing visual, contextual and industry case-study research as appropriate.

Related Principle: ORIGINATE

LO 2 Concept/Ideation

Generate first concept ideas or strategic project themes drawing upon reference to acquired research materials

Related Principle: ORIGINATE

LO 3 Development/Prototyping
Demonstrate a range of tests and solutions, informed by knowledge of the principles of the creative process.
Related Principle: INTEGRATE

## Indicative Assessment Criteria

Identify suitable hardware and topology for a Local Area Network based on given scenario including cables, switches, routers etc.  (LO1)

Discuss various network protocols and how they will be used on a network (LO2)

With the help of CISCO Packet Tracer, design a network with appropriate configuration of devices, IP Schemes and. (LO3)

Differentiate between available choices of Network Operating Systems (LO2,LO3)

Describe hardware security and its uses within computer hardware (LO1)

## Learning and Teaching Methods

This unit will be delivered using a combination of:

- Lectures / Seminars (blended learning)
- Online activities
- Self-directed independent study
- Peer learning, group discussion, guest speakers

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| Assessment methods and tasks | |
| --- | --- |
| **Assessment tasks** | **Weighting (%)** *(one grade or multi-grade unit)* |
| A portfolio of practical outcomes which might include tests, experiments, research and development material | 40% |
| Online test | 30% |
| Group Presentation | 30% |

## Essential Reading list

The Cyber Security Body of Knowledge. (2019). 1st ed. The National Cyber Security Centre.

Meyers, M. and Weissman, J. (2018). Mike Meyers CompTIA Network+ Guide to Managing and Troubleshooting Networks Lab Manual, Fifth Edition (Exam N10-007). McGraw-Hill Education;.

Sequeira, Anthony. CompTIA Network+ N10-007 Cert Guide. Pearson IT Certification, 2018.

**Recommended Reading List**
Tanenbaum, A. and Feamster, N. (2020). *Computer networks*. 6th ed. Pearson.

Gupta, B., Perez, G., Agrawal, D. and Gupta, D. (2020). *Handbook of Computer Networks and Cyber Security*. Cham: Springer.

Stallings, W. (2017). *Network security essentials*. Boston [etc.]: Pearson.

Further reading and resources will be identified in your Project Brief.

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