

## MODULE DESCRIPTOR

<b>MODULE TITLE</b>	Network Operations and Management		
<b>MODULE CODE</b>	CO4513 (7)	<b>CREDIT VALUE</b>	<b>20 / 10 ECTS</b>
<b>SCHOOL</b>	SCHOOL OF SCIENCE		

### MODULE AIMS

This module builds on underlying communication networks principles and discusses emerging trends and technologies. This is used as a basis for considering the issues of using a network for high-speed network applications. A detailed understanding of current and evolving topics are applied and investigated.

Module Aims:

1. To provide a practical understanding of the problems of network operations and management.
2. To introduce operating system theory and practice
3. To examine a range of techniques/methods for analysing and simulating possible solutions.
4. To investigate current and evolving topics in computer networks.
5. To explore impact of emerging technologies on designing, running and management of the networks.

### MODULE CONTENT

Network communications overview

Network Design

Methods

Characterising existing network and traffic

Designing a network topology

Simulation

Simulation Methodologies e.g. discrete event simulation, monte-carlo

Network measurement

Application performance

Network load patterns

Evaluation

Importance of comparison

Metrics

Current network design research

Operating systems

Concepts e.g. kernel, memory management, scheduler, filesystems

Deployment e.g. PXE, imaging, WSUS

Patch management

Change management e.g. puppet or chef

User management

Creation, deletion, updating

Single sign on

Federated identity management

Directory services

Active directory, LDAP, nis, DNS

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## Network Services

Email, Web, File, DNS, VoIP  
Monitoring, restarting  
Virtualisation and Cloud

## Network monitoring

Desktop/server/service monitoring  
Network packet/flow monitoring  
QoS

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## INTENDED LEARNING OUTCOMES

On successful completion of this module a student will be able to:

1. Robustly carry out and analyse network design
2. Critically evaluate operating systems and applications for suitability in network designs
3. Effectively deploy network management tools and use their feedback to evaluate network service
4. Critically evaluate new and future trends in network communications and their possible impact in real life network applications
5. Create and maintain a networked infrastructure

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## TEACHING METHODS

The module will be delivered as a set of lectures and laboratory sessions. The lectures will introduce the theoretical content for the module whilst the labs will allow the students to consolidate the theory in a practical setting.

During the module students will implement small experimental testbeds in order to learn how to configure components as well as assessing performance and component interaction. They will also engage in a network design task where they have to design a network for a medium sized organisation.

As a highly practical module – the teaching is by example and by doing. Lectures are collaborative with class input and practical components are often part of the lectures themselves as well as the workshops. This is a research-informed class, i.e. the teaching strategy includes research components, which are also evident in the practical aspects of the class.

As this is a skills based course, the assessment is both focused on knowledge content and skills. The content component of the module is mainly assessed in the module examination, whereas the skills and practical understanding of the module content is assessed in the coursework component. Therefore, the coursework assessment component for this module requires that students do work in between taught classes and that this is reviewed before the examination component of the assessment – to that end the students can get feedback on the coursework assessment to contribute to their preparation for the examination assessment component.

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## ASSESSMENT METHODS

This module is assessed through a report (50%) and a Practical Investigation Report (50%).