

Liverpool John Moores University

Title: NETWORKS AND COMMUNICATIONS
Status: Definitive but changes made
Code: **5012ENG** (106176)
Version Start Date: 01-08-2016

Owning School/Faculty: Electronics and Electrical Engineering
Teaching School/Faculty: Electronics and Electrical Engineering

Team	Leader
Ronan McMahon	Y

Academic Level: FHEQ5 **Credit Value:** 24 **Total Delivered Hours:** 87
Total Learning Hours: 240 **Private Study:** 153

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	48
Practical	12
Tutorial	24

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	70	3
Essay	AS2	Networks Coursework	15	
Essay	AS3	Telecommunications Coursework	15	

Aims

Following this module, students will be able to describe different network types, their associated structures and protocols. Students will be familiar with standards, and the various associated bodies. Students will be familiar with modulation and coding used to support the transport of data.

Learning Outcomes

After completing the module the student should be able to:

- 1 Differentiate between various types of network, network devices and interconnections
- 2 Explain properties/aspects of various protocols
- 3 Find standards documentation on appropriate web sites
- 4 Discuss an installation procedure of a networked computer.
- 5 Describe wave propagation in a transmission line, Fibre Optic cables, and in free space
- 6 Explain the principles of AM, FM modulation
- 7 Design a simple Huffman code.
- 8 Understand the general principles of telephony and television.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

EXAM	1	2	3	4	5	6	7	8
CW	3	4						
CW	5	6						

Outline Syllabus

Network classification: by geographic scale and by transmission technology.

Network hardware: Cabling, NICs, Repeaters, Hubs, Bridges, Switches and Routers.

The OSI seven layer network architecture.

High and low level protocols (specialised in case study below).

Case study: Ethernet.

Case Study: the Internet.

Operating system installation for a Networked Computer.

Introduce general communication principles; wavelength, electromagnetic frequency spectrum.

Transmission lines Reflection coefficient, propagation, characteristic impedance.

Free space propagation, antenna systems, propagation

Carrier wave modulation; AM and FM modulation and demodulation principles.

Information theory and code design: Information measure, source entropy, Huffman code.

General principles of telephony systems

Multiplexing: PDH, SDH

Learning Activities

By a series of lectures, tutorials and laboratory assignments

Notes

This module develops the principles of communications, modulation, information theory, local and wide area networks and their protocols.