

Liverpool John Moores University

Title: PRINCIPLES OF COMPUTING AND COMMUNICATIONS
 Status: Definitive
 Code: **5040COMP** (115982)
 Version Start Date: 01-08-2014

Owning School/Faculty: Computing and Mathematical Sciences
 Teaching School/Faculty: Computing and Mathematical Sciences

Team	Leader
Martin Randles	Y
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Academic Level: FHEQ5 **Credit Value:** 24.00 **Total Delivered Hours:** 72.00

Total Learning Hours: 240 **Private Study:** 168

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24.000
Practical	12.000
Seminar	12.000
Tutorial	24.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Coursework - Students will develop a networking design plan for a particular application development project.	50.0	
Portfolio	AS2	Coursework - Students will develop a portfolio of computer modeling exercises reflecting the different techniques covered during the module.	50.0	

Aims

*Develop an understanding of computer networks, their protocols and architecture.
Study the Internet as the major example of a Wide Area Network.
Consider mathematical methods for modeling computing and communications.
Understand how abstract modeling can be applied to computing examples.*

Learning Outcomes

After completing the module the student should be able to:

- 1 Evaluate computer networks, their architectures and protocols.
- 2 Analyse the requirements and formulate solutions for networking computing applications.
- 3 Use mathematical notations to analyse and model aspects of computing systems.
- 4 Apply the abstract concepts of sets, functions, relations, trees and graphs to computing examples.

Learning Outcomes of Assessments

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

Design plan	1	2
Computer modelling	3	4

Outline Syllabus

Within the core themes outlined in the learning activities, contemporary examples of social technology will be discussed which may include topics such as:

- Networking; applications, protocols, architecture*
- Data Communications; physical layer, data-link, LANs*
- Internet; TCP/IP, routing, DNS*
- Internet application protocols; SMTP, HTTP, P2P*
- WAN/Access – broadband, enterprise networks*
- Network Management – SNMP, security, multimedia and traffic*
- Engineering principles and role of modelling in computing*
- Propositions and predicates, logical connectives, truth tables*
- Concepts of set theory, set membership, union, intersection and difference*
- Cartesian products; coordinate systems; vectors and matrices*
- Functions and their properties; composition. Recursive definitions*
- Functions of discrete and continuous variables*
- Relations, inverse relations, composition.*
- Trees and graphs*

Learning Activities

Students will participate in lectures, tutorials, seminar/group work, and practical/lab sessions.

References

Course Material	Book
Author	Tannebaum, A.S.
Publishing Year	2010
Title	Computer Networks
Subtitle	
Edition	5th
Publisher	Prentice Hall
ISBN	0132126958

Course Material	Book
Author	Comer, D.
Publishing Year	2009
Title	Computer Networks and Internets
Subtitle	
Edition	5th
Publisher	Prentice Hall
ISBN	0136079679

Course Material	Book
Author	Kurose, J.F. & Ross, K.W.
Publishing Year	2008
Title	Computer Networking
Subtitle	A Top Down Approach
Edition	4th
Publisher	Addison-Wesley
ISBN	0321497708

Course Material	Book
Author	Haggarty, R.
Publishing Year	2002
Title	Discrete Mathematics for Computing
Subtitle	
Edition	
Publisher	Addison-Wesley
ISBN	978-0-201-73047-0

Course Material	Book
Author	Kolman, B., Busby, R.C., Ross, S.C.
Publishing Year	2008
Title	Discrete Mathematical Structures
Subtitle	
Edition	6th

Publisher	Prentice Hall
ISBN	978-0132078450

Course Material	Book
Author	Dossey, J.A., Otto, A.D., Spence, L.E., Eynden, C.V.
Publishing Year	2006
Title	Discrete Mathematics
Subtitle	
Edition	5th
Publisher	Addison-Wesley
ISBN	978-0673980397

Notes

This module aims to show the technical and formal underpinnings upon which the majority of modern computing practices are founded. Firstly the technical aspects of the Internet are studied, giving students an understanding of the structure and operation of Internet technology. Secondly the formal principles, governing these structures and operations, are explained in terms of the models and formal methods, used in computer science, which draw heavily on concepts from discrete mathematics. Through the appreciation of both the Internet technologies, upon which most systems are based, and the underlying formal properties and models of these systems, students will have the necessary knowledge and comprehension to undertake major IT development projects.