

## Liverpool John Moores University

Title: PRINCIPLES OF COMPUTING AND COMMUNICATIONS  
Status: Definitive  
Code: **5001HCOM** (118823)  
Version Start Date: 01-08-2011

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

Team	Leader
Martin Randles	Y

**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

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

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

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

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

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

<b>Publisher</b>	Prentice Hall
<b>ISBN</b>	978-0132078450

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

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## 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.