CM0635 Applied Computer Networks 1

Applied Computer Networks 1 Image

This module is designed to serve as an introduction to the theory and practice of computer networking. The module uses a well-equipped network laboratory containing industry-standard routers and switches. It emphasises practical aspects of building and maintaining Local Area Networks.
The main ideas are communicated in a series of 12 lectures. The laboratory sessions are used by students to put these ideas into practice in a variety of networking exercises. By the end of the module, students should be able to design, configure, document and maintain a small LAN and to understand the basic principles underlying the Internet.
The principles and techniques taught in this module are used extensively in the module CM0636 Applied Computer Networks 2.

1. Module Team

Module Tutor
David Kendall david.kendall@northumbria.ac.uk
Lecturer
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2. Teaching Arrangements

Lecture Mon 15.00 - 16.00 EB A007 (Weeks 1-6), Thu 12.00 - 13.00 EB A110 (Weeks 7-12)
Lab/Seminar Tue 09.00 - 10.00 EB Lab D003 South
Lab/Seminar Tue 10.00 - 11.00 EB Lab D003 South

You should attend the lecture session and one of the lab/seminar sessions every week.

N.B. The time and place for the lecture changes in week 7. Please make sure that you take this into account when planning any external activities, so that you are available to attend the lecture throughout the semester.

3. Synopsis

The aim of this module is to provide an intensive introduction to the fundamental principles of computer networking and their application to the solution of practical problems of design and implementation in Local Area Networks.

On completion of this module, students will be able to:

1. Explain in detail the structure of the OSI Reference Model and the concepts of a layered data communication model.
2. Apply appropriate theory, practices and tools for the specification, design, implementation and evaluation of Local Area Networks.
3. Discuss the design principles and implementation of a variety of key networking protocols and algorithms and critically evaluate their effectiveness in a range of practical applications.

4. Teaching Plan

The following is a *provisional* guide to the organisation of the module for this year. These arrangements are subject to change during the course of the module.

Week	W/c	Lecture	Practical
1	18-Jan	Introduction [Slides]	Network Practical 1 [Lab]
2	25-Jan	Physical Layer 1 [Slides]	Network Practical 2 [Lab]
3	01-Feb	Physical Layer 2 [Slides]	Network Practical 3 [Lab]
4	08-Feb	Data Link Layer 1 [Slides]	Network Practical 4 [Lab]
5	15-Feb	Data Link Layer 2 [Slides]	Network Practical 5 [Lab]
6	22-Feb	Network Layer 1 [Slides]	No supervised lab session
7	01-Mar	Network Layer 2 [Slides]	Network Practical 7 [Lab]
8	08-Mar	Network Layer 3 [Slides]	Network Practical 8 [Lab]
9	15-Mar	Transport Layer 1 [Slides]	Network Practical 9 [Lab]
10	22-Mar	Transport Layer 2 [Slides]	Network Practical 10 [Lab]
11	29-Mar	Application Layer 1	Network Practical 11

		Slides]	Lab]
12	26-Apr	Application Layer 2 [Slides]	No supervised lab session.
13	03-May	Assignment demos - details to be announced.	Assignment demos - details to be announced.

Note:
In addition to the taught sessions, you are expected to undertake independent and directed learning. On average, you should be spending about 8 hours per week on this module.

5. Assessment

Summative assessment comprises:

- A practical networking exercise, involving some group work in the lab and an individual written report.

Formative assessment comprises a variety of theoretical and practical exercises with opportunities for discussion with tutors and colleagues.

- Assignment Specification

6. Recommended Reading

You are strongly advised to obtain either of the first two texts from the list below for your personal use. The CCNA exam certification guide is useful for Cisco-specific information and for preparation for vendor-certification should you choose to undertake it. Try the Northumbria University campus bookshop.

- Kurose, J., Ross, K. *Computer Networking: A Top-down Approach Featuring the Internet* (3rd Edition), Addison Wesley, 2004 [Amazon] [Student Resources]
- Tanenbaum, A., *Computer Networks* (4th edition), Prentice Hall, 2002 [Amazon]
- Odom, W, *Cisco CCNA Official Exam Certification Library*, Cisco Press, 2006 [Amazon]

Selected articles from the technical literature, as directed by your tutors, e.g.

- IEEE/ACM Transactions on Networking
- IEEE Transactions on Communications
- RFCs, IEEE & IETF standards
- Industry white papers and technical documentation

7. Other resources

- The Cisco Networking Academy curriculum is a valuable resource. There are local copies of the curriculum:
  - CCNA Exploration 1
  - CCNA Exploration 2
  - CCNA Exploration 3
  - CCNA Exploration 4
  - Packet Tracer 4.11 (Windows)
  - Packet Tracer 5.1 (Windows)
- RFC search
- Technical Resources and Course Web Site for Data and Computer Communications, Sixth Edition