Course Outline

mic Studies
A POLYTECHNIC INSTITUTION chnology
Option: Part-time Studies

Course Number: COMP 3721
Course Name: Introduction to Data Communication and Networking

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Start Date: September 2, 2008 **End Date:** December 5, 2008

Total Hours: 45 **Total Weeks:** 15 **Term/Level:** 3 **Course Credits:** 3
Hours/Week: 4 **Lecture:** 3 **Lab:** 1 **Shop:** **Seminar:** **Other:**

Prerequisites

Course No.	Course Name
COMP 2720	Computer Organization & Architecture

Course Number is a Prerequisite for:

Course No.	Course Name

ν Course Description (required)

- To understand the basic concepts and terminology related to Data Communications and Computer Networking. Network topologies.
- Understand the principles of protocols at Physical, Data link, and Network layers.
- Understand the use and characteristics of Transmission media, Digital Transmission, and Switching techniques.
- Understand basic Error Detection and Correction, Elementary Data Link Protocols, and flow control. Introduction to Routing and Congestion control issues.
- Introduction Multiple Access protocols, LANs and WANs.
- Introduction to Networking and Internetworking devices.
- Overview of TCP/IP Architecture.
- Analysis of the TCP/IP Protocol Suite

ν Evaluation

Final Examination:	40%	Comments:
Midterm Exam:	30%	
Assignments:	30%	
TOTAL	100%	

ν Course Learning Outcomes/Competencies

- Explain the basic concepts and terminology related to Data Communications and Networking.
- Discuss and compare network protocol implementation using a layered approach.
- Apply basic data communication theory to the performance analysis of networks.
- Explain and describe the characteristics of various transmission media.
- Be able to discuss and analyze protocols at the Physical, Link Level, Network and Transport layers.
- Explain the performance and characteristics of the TCP/IP protocol suite.
- Explain and identify key protocol information given samples of captured packets.

ν Verification

I verify that the content of this course outline is current.
Aman Abdulla August 2008

Authoring Instructor | Date

I verify that this course outline has been reviewed.

Program Head/Chief Instructor | Date

I verify that this course outline complies with BCIT policy.

Dean/Associate Dean | Date

Note: Should changes be required to the content of this course outline, students will be given reasonable notice.

ν Instructor(s)

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Assistant Instructor	Office Hrs.:	TBA	E-mail Address:	jason_harrison@bcit.ca

ν Learning Resources

Required:

Data Communications and Networking (4th Edition)
Behrouz Forouzan
McGraw-Hill

Recommended:

Computer Networks (Fourth Edition)

Andrew S. Tanenbaum

Prentice-Hall.

Data And Computer Communications.
William Stallings
Prentice-Hall

ν Information for Students

(*Information below can be adapted and supplemented as necessary.*)

Assignments: Late assignments, lab reports or projects will **not** be accepted for marking. Assignments must be done on an individual basis unless otherwise specified by the instructor.

Makeup Tests, Exams or Quizzes: There will be **no** makeup tests, exams or quizzes. If you miss a test, exam or quiz, you will receive zero marks. Exceptions may be made for **documented** medical reasons or extenuating circumstances. In such a case, it is the responsibility of the student to inform the instructor **immediately**.

Ethics: BCIT assumes that all students attending the Institute will follow a high standard of ethics. Incidents of cheating or plagiarism may, therefore, result in a grade of zero for the assignment, quiz, test, exam, or project for all parties involved and/or expulsion from the course.

Attendance: The attendance policy as outlined in the current BCIT Calendar will be enforced. Attendance will be taken at the beginning of each session. Students not present at that time will be recorded as absent.

Illness: A doctor's note is required for any illness causing you to miss assignments, quizzes, tests, projects, or exam. At the discretion of the instructor, you may complete the work missed or have the work prorated.

Attempts: Students must successfully complete a course within a maximum of three attempts at the course. Students with two attempts in a single course will be allowed to repeat the course only upon special written permission from the Associate Dean. Students who have not successfully completed a course within three attempts will not be eligible to graduate from the appropriate program.

Course Outline Changes: The material or schedule specified in this course outline may be changed by the instructor. If changes are required, they will be announced in class.

Labs: Lab attendance is mandatory. Lab exercises are due at the end of the lab period.

I.D. Required in Examination Centres: Effective December 2000, in order to write exams, students will be required to produce photo-identification at examination centres. Photo I.D. must be placed on the desk before an exam will be issued to the student. The I.D. must remain in view on the desk while writing the exam, for inspection by invigilators. Students should bring a BCIT OneCard or alternatively two pieces of identification, one of which must be government photo I.D. such as a driver's licence. Please see BCIT Policy #5300, Formal Invigilation Procedures.

Computer Use Policy: BCIT has an Institute-wide policy (#3501) pertaining to information technology and services and to the resources available in support of the Institute mission. Computer Systems Technology students are expected to exercise the highest degree of professionalism and ethical behaviour related to information technology. Violations of BCIT Policy #3501 will result in disciplinary action which may include suspension or expulsion of students. Also refer to the Computer Systems Technology Student Conduct Guidelines.

Assignment and Quiz Details

- There will be 4 or 5 assignments in this course. The assignments will cover the essentials of the various chapters. It is **strongly suggested** that you work on those problems, master them, and then try different scenarios on your own to reinforce the concepts. We will be discussing the assignment problems in the labs.

Schedule

Week of/ Number	Outcome/Material Covered	Reference/ Reading	Assignment	Due Date
1	• **Introduction and Basic Concepts** o Line Configuration and Transmission Mode o Network Topology o Categories of Networks and Internetworking o Line Configuration, Network Topology and Transmission Mode o The OSI Model	Chapters 1, 2		
2	• **Signals, Encoding and Modulation** o Analog Transmission o Digital Transmission o Time and Frequency Domains o Composite Signals o Digital-to-Digital Conversion o Analog-to-Digital Conversion o Digital-to-Analog Conversion o Analog-to-Analog Conversion	Chapters 3, 4, 5		
3	• **Multiplexing** o Frequency Division Multiplexing o Time-Division Multiplexing o Spread Spectrum	Chapter 6		
4	• **Digital Data Transmission and Transmission Media** o Guided and Unguided Media o Transmission Media Impairments	Chapter 7		

Week of/ Number	Outcome/Material Covered	Reference/ Reading	Assignment	Due Date
5	• **Using Telephone and Cable Networks for Data Transmission** o DTE-DCE Interface o Modems o DSL Fundamentals o Asymmetric Digital Subscriber Line (ADSL) o Very-High-Bit-Rate Digital Subscriber Line (VDSL) o Cable TV for Data Transfer	Chapter 9		
6	• **Error Handling and Data Link Control** o Error Detection Codes o Flow Control o Stop-and-Wait Protocols o Sliding Window Protocols	Chapters 10, 11		
7	• **LANs and Switching** o Multiple Access Protocols o The IEEE 802 Standard for LANs o Ethernet o Circuit Switching o Packet Switching o Message Switching	Chapters 12, 13		
8	• **Networking and Internetworking Devices** o Repeaters, Bridges, Routers and Gateways o Distance Vector Routing o Link State Routing	Chapter 15		
9	• **The TCP/IP Protocol Suite** o TCP/IP Protocol Overview o Internetwork Protocol o Addressing Issues and design o User Datagram Protocol o Transmission Control Protocol	Chapter 20, 22, 23		

Note: *It is expected that you have a working knowledge of solving algebraic equations and manipulating logarithms. It cannot be emphasized enough that the only way to assimilate the large number of concepts is to actually do the problems yourself. You will find it most beneficial to pre-read the chapters before lectures and in fact attend the lectures.*

- You are required to read the specified chapters in your textbook as per the course outline. From time to time (as required), some notes be posted on the Data Comm Web server which you may access using the following URL:

http://milliways.bcit.ca/c3721/