A POLYTECHNIC INSTITUTION OF TECHNOLOGY

School of *Computing and Academic Studies*
Program: *Computer Systems Technology*
Option: *Data Communications*

Course Outline for:
COMP 4981
Data Communications and Networking 2

Start Date: **End Date:**

Total Hours: 60 **Total Weeks:** 15 **Term/Level:** 4 **Course Credits:** 5
Hours/Week: 4 **Lecture:** 2 **Lab:** 2 **Shop:** **Seminar:** **Other:**

Prerequisites

Course No.	Course Name
Comp 3980	
Comp 3721	
Comp 3510	

is a Prerequisite for:

Course No.	Course Name

■ Course Description

- Covers advanced UNIX system programming for Data Communications.
- Develop TCP/IP Network applications using the Berkeley socket interface.
- Develop Client-Server models on the Linux environment using IPC, RPC, and TCP/IP
- Coverage of selected topics such as Multicasting, Raw Sockets, and ICMP

■ Evaluation

Examination/Quizzes:	30 %
Assignments & Projects:	70 %
TOTAL	100%

Comments:

The evaluation is **TENTATIVE** and will be discussed and finalized in class.

■ Course Learning Outcomes/Competencies

Upon successful completion, the student will be able to:

- Implement advanced communications protocols for the UNIX (Linux) environment.
- Develop Client-Server models IPC and the TCP/IP Protocol suite.
- Understand and apply all aspects of Advanced UNIX Systems Programming.
- Design and develop programs for Internetworking applications using Internet Protocol Suite.
- Analyze and implement security measures on Linux servers using standard tools and packages.
- Design and develop highly specialized communications software within a project team.
- Install, configure, and manage a Linux/Win32 based LANs.

■ Verification

I verify that the content of this course outline is current.

Aman Abdulla — January 4, 2009

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.

■ Instructor(s)

Aman Abdulla	Office Location:	SW2 323	Office Phone:	604-432-8837
	Office Hrs.:	TBA	E-mail Address:	aabdulla@milliways.bcit.ca

■ Learning Resources

Required:

UNIX Network Programming Vol. 1 - By W. Richard Stevens
Networking APIs: Sockets and XTI
Prentice-Hall

UNIX Network Programming Vol. 2 - By W. Richard Stevens
Interprocess Communications
Prentice-Hall

The **Linux** operating system:

Recommended:

ADVANCED PROGRAMMING IN THE UNIX ENVIRONMENT - By W. Richard Stevens
Addison-Wesley

■ Information for Students

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 Policy 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 #5002, Formal Invigilation Procedures.

- **Cheating and Plagiarism**
- **Student Conduct**
- **Responsible Use of Information Technology at BCIT**: your receipt of this outline and your attendance in this course signifies that you have been made aware of these official BCIT policies which are detailed on the BCIT web site and referred to on the last page of this outline.

■ Assignment Details

The course will be comprised of extensive lectures and lab time. The lectures will cover a broad range of topics that are required to **APPLY** the principles of data communications. The material from these "how to" lectures will immediately be put into practice in the exercises and the projects.

Schedule

	Topics	Reference /Reading
1	**UNIX operating system concepts**: UNIX File System Concepts Multiple Processes & Threads Pipes Signals	UNP. Vol. 2
2	**Advanced UNIX concepts**: Interprocess Communications (IPC) FIFOs Message Queues Semaphores Shared Memory	UNP. Vol. 2
3	**TCP/IP Protocols:** Internet Protocol (IP) Transmission Control Protocol (TCP) User Datagram Protocol (UDP)	UNP. Vol. 1
4	**The Berkeley Socket Interface**: Implementation using Socket system calls Asynchronous I/O Raw Sockets Internet Control Message Protocol (ICMP) Multicasting Multiplexed socket I/O	UNP. Vol. 1
5	**Client-Server Models**: Concepts Implementation using IPC facilities Implementation using Sockets	Both UNP Texts
6	Linux security concepts.	Class Notes.
7	X Window Programming Issues – Qt (Self study module)	TBA

****Topics may be omitted, replaced or added at the discretion of the instructor.**

- The notes will be posted on my web server which you may access using the following URL:

  http://milliways.bcit.ca/c4981/

CST Student Conduct Guidelines

The School of Computing and Academic Studies expects the highest level of professional conduct and ethical behaviour from all students enrolled in Computer Systems Technology (CST) courses and programs.

All students are reminded of the following BCIT policies related to student conduct:

- Policy 5002 Cheating and Plagiarism
  www.bcit.ca/files/pdf/policies/5002.pdf
- Policy 5002 Student Conduct
  www.bcit.ca/files/pdf/policies/5002.pdf
- Policy 3501 Responsible Use of Information Technology at BCIT

  www.bcit.ca/files/pdf/policies/3501.pdf

CST students are especially reminded that the Computing and IT knowledge and skills acquired in the course of their studies confer upon them, as with all IT professionals, a special responsibility to use this knowledge in a responsible, professional and ethical manner.

Given that misuse of computer facilities at BCIT can have significant legal and/or economic impacts, upon evidence of any violation of Policy 3501, the School may recommend immediate suspension, even for first offences.

By attending this course, every student has been made aware of these policies and the actions that will be taken. Please follow the links provided, each student is responsible to read and comply with these policies.