Course Outline
School of Computing and Academic Studies
Program: Computer Systems Technology COMP 7005
Option: Bachelor of Technology, Computer Systems Computer Networks and Protocols
Start Date: September 3, 2014 End Date: December 5, 2014
Total Hours: Total Weeks: Term/Level: Course Credits:
Hours/Week: 3.75 Lecture: 1.25 Lab: 2.5
Prerequisites COMP 7005 is a Prerequisite for:
Course No. Course Name Comp 8005 Data Communication Applications
Diploma of Technology in Computer Systems (or
equivalent) or permission of instructor and program head.
 Course Description
This course will cover the advanced elements of Data Communication and Network Architecture. The TCP/IP protocol suite
and its application within the Internet architecture will be examined in depth, and in a practical manner. Also covered will be
advanced topics such as Wireless Data Communication, and Security Protocols, and Cryptology. Students will be introduced to
the Berkeley socket API, and the basics of Client/Server programming will be introduced.
 Evaluation
Final Examination 30% Comments:
Midterm 20%
Assignments 20%
Final Project 30%
TOTAL 100%
 Course Learning Outcomes/Competencies
Upon successful completion, the student will:
1. Have an in-depth understanding of Data Communication protocols with an emphasis on practical applications.
2. Understand and analyze Peer-to-Peer protocols, Routing algorithms, and Network congestion issues.
3. Have a detailed understanding of the TCP/IP protocol suite and analyze the various components of the protocol suite in a
practical manner.
4. Use the TCP/IP socket API to design and implement basic Client/Server applications.
5. Have a detailed understanding of Wireless and Mobile networks.
6. Understand the basics of Network Security be able to analyze and evaluate security protocols for potential use within an
organization.
7. Acquire a solid foundation for pursuing more advanced courses such as COMP 8005 and COMP 8505. Verification
I verify that the content of this course outline is current.
Aman Abdulla July 28, 2014
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.: E-mail Address: aabdulla@milliways.bcit.ca
 Learning Resources
Required:
Computer Networking − 6th Edition
A Top-Down Approach
Kurose & Ross
Addison-Wesley
Recommended:
th
Data and Computer Communications – 9 Edition
William Stallings
Prentice-Hall
 The 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 Calendar will be enforced.
The following statements are in accordance with the BCIT Policies 5101, 5102, 5103, and 5104, and their accompanying
procedures. To review these policies and procedures, please refer to: www.bcit.ca/about/administration/policies.shtml
Attendance/Illness:
In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with his/her
instructor or Program Head or Chief Instructor, indicating the reason for th e absence. Prolonged illness of three or more
consecutive days must have a BCIT medical certificate sent to the department. Excessive absence may result in failure or
immediate withdrawal from the course or program. Please see Policy 5101 — Student Regulations, and accompanying
procedures: http://www.bcit.ca/files/pdf/policies/5101.pdf
Academic Misconduct:
Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are
prohibited and will be handled in accordance with Policy 5104 — Academic Integrity and Appeals, and accompanying
procedures: http://www.bcit.ca/files/pdf/policies/5104.pdf
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 their respective
program.Accommodation:
Any student who may require accommodation from BCIT because of a physical or mental disability should refer to BCIT’s
Policy on Accommodation for Students with Disabilities (Policy #4501), and contact BCIT’s Disability Resource Centre
(SW1-2300, 604-451-6963) at the earliest possible time. Requests for accommodation must be made to the Disability Resource
Centre, and should not be made to a course instructor or Program area.
Any student who needs special assistance in the event of a medical emergency or building evacuation (either because of a
disability or for any other reason) should also promptly inform their course instructor(s) and the Disability Resource Centre of
their personal circumstances.
 Assignment Details
Will be provided in class. Schedule
Topic Number Outcome/Material Covered
1 Computer Networks and the Internet: Chapter 1
• Components of a computer network
• Network core
• Access Networks and Physical Media
• ISPs and Internet backbones
• Delay and Loss in Packet-Switched networks
• Layered Architectures and Service Models
2 Application Layer: Chapter 2,
• Principles of Network Applications Notes and code
• Web and HTTP examples
• SMTP (E-mail)
• DNS
• P2P File Sharing
• Socket Programming API (TCP & UDP)
3 Transport Layer: Chapter 3
• Introduction to Transport Layer Services
• Multiplexing and Demultiplexing
• Connectionless Transport: UDP
• Principles of Reliable Data Transfer
• Connection-Oriented Transport: TCP
• Principles of Congestion Control
• TCP Congestion Control
4 Network Layer: Chapter 4
• Forwarding and Routing
• Virtual Circuit and Datagram Networks
• Router Architecture
• IP: Forwarding and Addressing in the Internet
• Routing Algorithms
• Routing in the Internet
• Broadcast and Multicast Routing
5 Link Layer and LANs: Chapter 5
• Multiple Access Protocols
• Link Layer Switches
• VLANs
• Link Virtualization
6 RF Principles Course notes
• RF wave propagation RF Propagation Models
• Antenna types
• Link Budget Calculations Topic Number Outcome/Material Covered
7 Wireless Networks – IEEE 802.11: Notes & Chapter 6
• Wi-Fi: 802.11 wireless LANs
• 802.11 Medium Access Control
• 802.11 Frame Types
8 Wireless and Mobile Networks: Notes & Chapter 6
• Wireless Links and Network Characteristics
• Wi-Fi: 802.11 wireless LANs
• Cellular internet access
• Mobility management
• Mobile IP
• Managing mobility in cellular networks
• Bluetooth Technology
9 Security and Cryptography: Chapter 8,
• Security Protocols Course notes &
• Cryptographic Algorithms
code examples
• Authentication & Integrity
• Key Distribution and Certificates
\*Topics may be omitted, replaced or added at the discretion of the instructor.
• Notes will be posted on my Web server which you may access using the following URL:
http://milliways.bcit.ca/c7005/