UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
COURSE OUTLINE

1. **Course:** CPSC 441: Computer Networks
   Lecture Sections:
   L01, MWF 12:00-12:50, Cyriac James, ICT 555, cyriac.james@ucalgary.ca
   Office Hours: M 13:00-14:00 W 14:00-15:00

   Course Website: D2L

   Computer Science Department Office, ICT 602, 220-6015, cpsc@cpsc.ucalgary.ca

2. **Prerequisites:** One of CPSC 319 or 331, and one of CPSC 325, 359 or ENCM 369
   (http://www.ucalgary.ca/pubs/calendar/current/computer-science.html#3620)

3. **Grading:** The University policy on grading and related matters is described in sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

In-Class Quizzes	5%
Assignments	30%
Midterm Test	25%
(Tuesday February 28th, 2017 at 18:00 in ENA 201)	
Final Examination	40%

   This course **will** have a Registrar's Scheduled Final Exam.

   Special Regulations affecting Final grade: Each of the above components will be given a percentage grade. The final grade will be calculated using the percentage grade awarded for each course component weighted by the percentage given above, and then reconverted into a final letter grade using the attached table. **In order to obtain a final grade of C- or better, and to pass the course, a student must achieve a weighted average of C- or better on the midterm and final exams**.

4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar. Section 3.6. It is the student's responsibility to familiarize theirself with these regulations. See also Section E.6 of the University calendar.

5. **Scheduled Out-of-Class Activities:** REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME ACTIVITY. If you have a clash with this out-of-class activity, please inform your instructor as soon as possible so that alternative arrangements can be made.

6. **Course Materials:**
   Computer Networking: A Top Down Aproach 7th Edition, Kurose and Ross, Pearson (Required)

   Online Course Components:
   D2L, Piazza and TopHat will be used.

7. **Examination Policy:** Closed book. No aids except a regular calculator are allowed. Students should also read the Calendar, Section G, on examinations.

8. **Approved Mandatory and Optional Course Supplemental Fees:** None.

9. **Writing across the Curriculum Statement:** In this course, the quality of the student's writing in the weighted components of the course will be a factor in the evaluation of these components. See also Section E.2 of the University Calendar.

10. **Human Studies Statement:** Students will be expected to participate as subjects or participants in projects. See also Section E.5 of the University Calendar.

11. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

a) **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offense that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under Section K, Student Misconduct to inform yourself of definitions, processes and penalties.

b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on assembly points which can be found in each classroom and building.

c) **Student Accommodations:** Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf. Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Computer Science.

d) **Safewalk:** Campus Security will escort individuals day or night (http://www.ucalgary.ca/security/safewalk/). Call 403-220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also http://www.ucalgary.ca/secretariat/privacy

f) **Student Union Information:** VP Academic (403) 220-3911 suvpaca@ucalgary.ca SU Faculty Rep (403) 220-3913 science1@su.ucalgary.ca, science2@su.ucalgary.ca and science3@su.ucalgary.ca, Student Ombuds Office: (403) 220-6420 ombuds@ucalgary.ca, http://ucalgary.ca/provost/students/ombuds

g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend your cell phone should be turned off unless instructed otherwise. All communications with other individuals via laptop computers, cell phones or other devices connectable to the internet in not allowed during class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

h) **U.S.R.I.:** At the University of Calgary feedback provided by students through the Universal Student ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference – please participate in USRI surveys.

Department Approval_____ Date_____

Faculty Approval for
out of regular class-time activity: _____
Date:_____

Faculty Approval for
Alternate final examination arrangements: _____
Date:_____

A signed copy of this document is on file in the Computer Science Main Office

CPSC 441 Percentage to Letter Grade Conversion Table

A+	95-100
A	90-94.99
A-	85-89.99
B+	80-84.99
B	75-79.99
B-	70-74.99
C+	65-69.99
C	60-64.99
C-	55-59.99
D+	50-54.99
D	40-49.99
F	0-39.99

CPSC 441 Syllabus

Tentative Topics Covered:

Introduction	1.5 weeks	• Computer networks and the Internet • Network edge and network core • Delay, loss, throughput • Layered architecture
Application Layer	2.5 weeks	• Principles of network applications • Web and HTTP • File transfer (FTP) • Email (SMTP) • Domain name system (DNS) • Peer-to-peer applications • Socket programming
Transport Layer	2.5 weeks	• Principles of data transfer • Connectionless transport (UDP) • Principles of reliable data transfer • Connection-oriented transport (TCP) • Flow control • Congestion control
Network Layer	2.5 weeks	• Principles of network layer • Router architecture • Internet protocol (IP) • Routing algorithms
Link Layer	2 weeks	• Principles of link layer • Error detection and correction • Multiple access control • Addressing • Ethernet
Wireless and Mobile Networks	2 week	• Wireless links • WiFi networks • Cellular networks • Mobility

Learning Outcome

By the end of the course, students will:

- Describe the layered architecture of the Internet and discuss the functionality of each layer.
- Compare TCP and UDP, and explain how reliability and congestion control are implemented in TCP.
- Understand how application messages are carried in the Internet by describing the encapsulation/de-encapsulation process, store-and-forward mechanism, routing and addressing.
- Analyze a simple computer network comprising of multiple routers and links to compute performance metrics such as packet loss, delay and throughput.
- Explain the functionality and operation of network protocols such as HTTP, FTP, SMTP, DNS, TCP, UDP, and BGP.
- Explain how IP addresses are obtained and assigned to end systems as well as discuss the operation of DHCP and NAT.
- Describe what a MAC protocol is and compare different types of MAC protocols in wired/wireless networks including ALOHA and CSMA.
- Develop client-server network programs that communicate with each other over the Internet using TCP and UDP protocol.
- Explain what a network protocol is, list several Internet protocols and explain for what purpose they are used.

Allowable Sources:

List any texts, websites, etc that are allowable for use in the course

Cited Sources:

What and how should sources be cited.

Examples: Code, design/ideas, etc.

Level of Collaboration between Students:

Will students be collaborating on course components, yes or no? To what extent? Can be different for different course components.

How will collaboration with others be cited?

Disclosure Policy

If you discuss the assignments with others, make sure to cite these discussions.