University of Wisconsin-Stevens Point
College of Letters and Science
Department of Computing and New Media Technologies
Stevens Point, WI 54481-3897
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CIS 225 – Data Communication and Networks, Section 1 (4 credits)
2:00 p.m. – 3:50 p.m. MW Location: SCI B348

Instructor: Daehee (Danny) Kim, PhD **Office:** B231, Science Building
Web: http://dannykim.me **Phone:** 715-346-2078
Office Hours: 1:00 – 2:00 p.m. MW **Email:** dkim@uwsp.edu
3:00 – 4:00 p.m. TR

Course Description
This course provides an introduction to fundamental concepts in the design and implementation of computer communication networks, their protocols, and architectures. Students learn how to popular network applications such as Web browser, FTP client, remote connection, and email work on computer networks. Topics to be covered include: physical basis for communication; modulation techniques; synchronous and asynchronous transmission; analog and digital signaling; multiplexing; communication hardware, software and protocols; routing algorithms; error detection and correction; basic concepts of local and wide area networks; network topologies.

Prerequisites
CIS120 (Data Structure and Algorithms)

Objectives
- Understand the Internet architecture and layering.
- Learn protocol design principles particularly TCP/IP
- Investigate naming and routing related issues
- Learn how to analyze network protocols for tradeoffs
- Design and/or implement a protocol for a given set of constraints

Required Text and Material Purchase
Kurose. Computer Networking a Top-Down Approach, 6th Edition. ISBM: 978-0-13-285620-1

Grading Policy:
Assessment:

• Midterm 1	15% (3/1 Wednesday, in class)*
• Midterm 2	15% (4/12 Wednesday, in class)*
• Final Exam	29% (5/16 Tuesday, 8:00 am ~ 10:00 am, Comprehensive Exam)
• 5 Assignments	20% (4% per assignment)
• 4 Quiz	16% (4% per quiz)
• Attendance	5% (sign on attendance sheet every class)

* Dates can be changed based on class progress

Grading scale:
Final grades will be determined according to the following scale:

		A	100 – 94%	A-	93 – 90%
B+	89 – 87%	B	86 – 83%	B-	82 – 80%
C+	79 – 77%	C	76 – 73%	C-	72 – 70%
D+	69 – 66%	D	65 – 60%	F	< 60%

Assignments

Assignments will be announced in class and posted on D2L. If you miss class, it is your responsibility to check D2L for any homework assignments and supporting material which may have been given out during class. I recommend that you start working on assignments as soon as possible after they have been announced. Assignments for this class almost always take longer than originally anticipated; starting early greatly increases your odds of completing the assignment to your satisfaction. Please call, email or see the instructor as soon as possible, and **before the due date**, with any questions or concerns about an assignment.

Due Dates & Late Assignments

Unless otherwise noted by the instructor, assignments should be submitted before class (soft copy of report document) and in the beginning of class (hard copy of report document) on the due date. Report document should contain following contents and use the template given by instructor.

- Short description of each question.
- How you solve each question.
- Screen capture of running results.

For the late assignments up to one week, the following reduction of the given points will be deducted.

- After due date ~ 1 week: 30% deduction of given points
- After 1 week ~ 2 weeks: 60% deduction of given points
- After 2 weeks: no points will be given.

Assignments may only be made up if the absence was due to documented illness, approved university activity or family emergency. If you miss class or an assignment due to an approved university activity, illness or family emergency on the day an assignment is due, it is your responsibility to contact the instructor **before the start of class that day** in order to make alternative arrangements.

Attendance

This class assumes perfect attendance. In the event you need to miss a class, please contact the instructor before absence, and consult with classmates regarding material you may have missed. Absence without excuse to the instructor will have an effect on your grade.

Academic Standards

The University of Wisconsin – Stevens Point is an academic community of individuals committed to the pursuit of learning, the acquisition of knowledge, and the education of all who seek it. This course expects that all work turned in for a grade is your own, or that of your group. A description of your rights and responsibilities as a member of the UWSP community can be found at:
http://www.uwsp.edu/dos/Pages/Information%20for%20Students.aspx

Student Academic Standards and Disciplinary Procedures (UWS/UWSP Chapter 14) is available at
http://www.uwsp.edu/dos/Documents/Community%20Rights%20and%20/Responsibilities.pdf#page=8

Academic Dishonesty Policy

Students may discuss assignments with each other and may seek help from the instructor. However, since assignment scores count as a part of the final grade, students must limit the amount of outside help they receive. Students must not copy any part of another person's work or break an assignment into a team project (unless directed to do so by the instructor). If there is ANY doubt in your mind about the amount of help given/received you should immediately consult with your instructor BEFORE submitting the assignment.

Any student who submits an assignment or exam which is in whole or in part the work of another person and any student (whether enrolled in the course or not) who so assists another student will be prosecuted under Chapter UWSP 14 of the Rules of the Board of Regents of the University of Wisconsin System, Wisconsin Administrative Code. Depending upon the severity of the infraction, the consequences of such an act range from a verbal reprimand to an "F" in the course to expulsion from the University.

Cell Phone, IM and Recording Devices

Please turn off cell phones before entering the classroom. Cell phones may not be used in the classroom without prior permission of the instructor. Instant messaging, including *Facebook and social media sites*, should also be turned off, unless you are communicating with a group member working remotely. If you would like to record (video or audio) any aspect of this course, please seek prior permission from the instructor.

Emergency Preparedness

In the event of a medical emergency, call 911 or use red emergency phone located outside of the Public Science Hall Lab (B238). Offer assistance if trained and willing to do so. Guide emergency responders to victim. In the event of a tornado warning, proceed to the lowest level interior room without window exposure at SCIENCE A224. In the event of a fire alarm, evacuate the building in a calm manner. Meet near the grassy area near Lot X. Notify instructor or emergency command personnel of any missing individuals.
Active Shooter – Run/Escape, Hide, Fight. If trapped hide, lock doors, turn off lights, spread out and remain quiet. Follow instructions of emergency responders. See UW-Stevens Point Emergency Management Plan at www.uwsp.edu/rmgt for details on all emergency response at UW-Stevens Point.

Communication by email

I do a lot of communication by email. When you email me, please include "CIS225:" in the beginning of subject. It will help me differentiate your email for this course with other emails.

Course schedule

- See "CIS225_schedule.pdf".

CIS225 – Data Communication and Networks (section 1): TENTATIVE COURSE SCHEDULE
*** Dates and topics are subject to change ***

Week	Approx. Dates	Topics	Homework	Exam	Read
1	1/23	syllabus, introduce(class, person), survey,			
	1/25	What is Internet, network edge, network core			Ch1
2	1/30	Delay, loss, throughput in networks, protocol layers and service models			Ch1
	2/1	Network under attack Hands-on practice (Wireshark) Quiz1: Chapter1		Quiz1	Ch1
3	2/6	Principles of network applications, network application architecture (client-server, P2P, hybrid), process, socket communication, How to choose transport protocols (TCP/UDP)	HW1		Ch2
	2/8	Web and HTTP			Ch2
4	2/13	FTP, SFTP, email (SMTP, mail message format, mail access protocols), POP3, IMAP			Ch2
	2/15	DNS, P2P applications			Ch2
5	2/20	GUI programming Socket programming (TCP, UDP) Hands-on practice (socket programming, chatting)	HW1 due HW2		Ch2
	2/22	Quiz2: Chapter2		Quiz2	Ch2
6	2/27	Midterm1 review			
	3/1	Midterm1 (chapter1, chpater2)		Midterm1	
7	3/6	Homework2 helping session			
	3/8	Transport-layer services, multiplexing and demultiplexing, connectionless Transport (UDP), building reliable data transfer protocol			Ch3
8	3/13	Reliable data transfer (pipeline, go-back-N, selective repeat), TCP (connection, header structure, sequence and acknowledge numbers)	HW2 due		Ch3
	3/15	TCP(RTT and timeout, fast retransmit, flow control, TCP session termination), Congestion control cases			Ch3
9	3/20	Spring Break (3/18 ~ 3/27): no class			
	3/22				
10	3/27	TCP congestion control	HW3		Ch3
	3/29	Quiz3: Chapter3		Quiz3	Ch3
11	4/3	Network service models, Virtual circuit and datagram networks, Router, IP (datagram format)			Ch4
	4/5	Internet Protocol (forwarding and addressing), NAT, ICMP, IP security			Ch4
12	4/10	Midterm2 review	HW3 due HW4		
	4/12	Midterm2 (chapter3, chapter4)		Midterm2	

13	4/17	Routing algorithms (link state and distance vector), Autonomous system (AS), RIP			Ch4
	4/19	OSPF, BGP, broad cast routing, spanning tree Multicast routing			Ch4
14	4/24	Quiz4: Chapter4	HW4 due HW5	Quiz4	Ch4
	4/26	Introduction to link layer, error-detection and error-correction, multiple access protocols			Ch 5
15	5/1	Switched local area networks. Link-layer addressing and ARP, VLANs			Ch 5
	5/3	Link virtualization (MPLS), Data center networks, A day in the life of a web request			Ch 5
16	5/8	Final Review	HW5 due		
	5/10	Final Exam preparation (no class)			
	5/16 (Tu)	Final Exam (8:00 am ~ 10:00 am), Comprehensive		Final	