Data Communication and Computer Networks
CS 391 - Fall 2022

Instructor:	George Thomas	**Office:** Halsey 218	
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Office Hours:	MW	9:30-10:30
	Tues	12:30-1:30
	Thurs	11:30-12:30
		Or by appointment

Lectures:	TuTh	9:40-11:10 AM	Halsey 309

Prerequisites: A grade of C or better in CS 212, CS 251, and CS 271

Required Textbook:
The following textbook is required:
- Pearson eText - *Computer Networking, A Top down approach* (James F. Kurose and Keith W. Ross), 8th edition -- Access Card, ISBN 9780135928790

Course Website: UWO Canvas

Note: If you have special needs, please do talk to me at the end of the first class.

Course Description: An introductory course which covers the basic concepts in data communication and computer networks. Topics covered will include the nature of data communication, characteristics of computer networks, the ISO-OSI network protocol layers, error detection and correction codes, and network performance considerations.

Topic Coverage:
1. Introduction to the Internet and its underlying foundations.
2. The layered architecture and the purpose of each layer: application, transport, network, link, and physical layers.
3. Overview of common network application protocols (e.g., email, Telnet, FTP, and HTTP).
4. Description of the various protocols in the TCP/IP protocol suite and how internet routing works.
5. Wireless and Mobile networks, Security in Computer Networks (Time permitting).

Course Outcomes:
At conclusion of the course, students will:
1. Be able to evaluate the performance of a single link, logical process-to-process (end-to-end) channel, and a network as a whole in terms of latency, bandwidth, and throughput.
2. Be able to differentiate among and discuss the levels of addresses (physical, logical, port, etc.) used by the TCP/IP protocols.
3. Understand the concept of reliable and unreliable transfer protocol of data and how TCP and UDP implement these concepts, to understand the client/server model and socket API with their implications.
4. Demonstrate an understanding of the significance and purpose of protocols and standards and

their key elements and use in networking.
5. Understand the purpose of network layered models, network communication using a layered architecture, and be able to compare and contrast the Open System Interconnect (OSI) and the Internet models.
6. Be able to distinguish between the different types of bit errors and explain the concept of bit redundancy and how it is generally achieved in the facilitation of error detection and the main methods of error correction.
7. Understand internetworking principles and how the Internet protocols IPv4, IPv6 and ICMP operate.
8. Understand routing principles and algorithms, such as distance vector and link state, RIP, OSPF, and BGP.
9. Explain the differences between control and congestion control at the transport layer as well as how these functions are implemented in TCP.
10. Describe how popular application-level protocols (such as HTTP, SMTP, DNS) work.

Course Grading Policy:
Your final grade for this course will be based on three components, namely exams, programming projects and homework. Your overall numerical grade for the course will be computed as the weighted sum of the component grades using the following weights:

Component	Weight
Exams (3)	55%
Projects	30%
Homework	15%

Tentative exam dates are as follows:
*   **Exam 1 – Thursday, 10/6**
*   **Exam 2 – Thursday, 11/10**
*   **Exam 3 – Thursday, 12/15**

Your letter grade for the course will be computed as follows:

Numerical Score	Grade	Numerical Score	Grade
>=92	A	72-78	C
90-92	A-	70-72	C-
88-90	B+	68-70	D+
82-88	B	62-68	D
80-82	B-	60-62	D-
78-80	C+	<60	F

While this overall grading scheme is fixed, I will be happy to discuss any issue you may have with individual grades. If you notice a mistake or have a question regarding a specific grade, please come and talk to me *as soon as possible*. Please do not wait until the end of the semester to bring up grading issues.

Project and Homework Deadlines:
Each homework will come with a deadline (day and time) by which it must be submitted. **Late homework submissions will NOT be accepted.**

Each project comes with a deadline (day and time) by which it must be submitted. You are allotted *three* credit days you can use through the semester on projects. A credit day is exactly 24 hours or less. You can use unused credit days to submit a project after its deadline, without penalty. Any project submitted after the deadline, plus any credit days you have unused, will receive a zero.

For example, if you have 2 unused credit days available and an assignment is due on Tuesday at 5:00PM, you can submit it anytime by exactly Thursday at 5:00PM without penalty. Do note that if you submit your assignment on Thursday at 5:01PM, you will be penalized 100% of the score of the assignment and thus receive a zero! Note also that if you submit your assignment on Wednesday at 5:01PM, you will be charged two credit days (but no penalty, obviously).

Attendance Policy:
I do not require attendance for this course, but I do encourage you to attend and hope it will be beneficial to you. When attending class, please do come prepared for, and participate actively, in it. *Topics and material may be covered during the lectures that are not in the textbook or presented on Canvas. If you miss lecture, it is your responsibility to make sure you catch up on anything you may have missed!*

Extensions and Makeups:
Extensions on deadlines may be granted at the discretion of the instructor if you provide a valid justification (in the form of a written excuse from a medical doctor or the Dean of Students Office) **before** the due date.

If you miss a scheduled exam (tentative dates are provided), you **may** be able to take a make-up exam provided you give the instructor a valid justification (see above) ahead of time if possible. Only one make-up exam will be given. It will be a comprehensive exam scheduled at the end of the semester.

Collaborating versus Cheating:
Unless stated otherwise in the instructions for a deliverable, all submissions must be entirely your own work. While it is acceptable to discuss deliverables at a high level (for example, at the design level) with others, you must submit your own work. **You may not "borrow" any piece of code or design of any length from someone else, the internet, or any other source, unless you can live with a zero and the other potential academic sanctions of cheating** (see UWO Student Discipline Code 2007, Chapter UWS 14).

Statement Regarding Diversity, Equity & Inclusion:
Diversity drives innovation, creativity, and progress. At the University of Wisconsin Oshkosh, the culture, identities, life experiences, unique abilities, and talents of every individual contribute to the foundation of our success. Creating and maintaining an inclusive and equitable environment is of paramount importance to us. This pursuit prepares all of us to be global citizens who will contribute to the betterment of the world. We are committed to a university culture that provides everyone with the opportunity to thrive.

Required Disclosure Statement:
Students are advised to see the following URL for disclosures about essential consumer protection items required by the Students Right to Know Act of 1990:
https://uwosh.edu/financialaid/consumer-information/