

New York City College of Technology
Department of Computer Engineering Technology

EMT 2455 – Data Communications

URL: www.citytechrobotics.org/EMT2455.htm

- Instructor:** Dr. X. Li
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Office: V642, Tel: 718-260-5885
Office Hours: TBA on course website
- Course Objectives:** Fundamentals of data communications and computer networks protocols and standards. It provides a basic understanding of data communication systems with practical examples of communication networks as applied in engineering technology. Study of OSI and TCP/IP models, data transmissions, transmission media, network topologies, network cabling system, IP addressing, TCP/IP suite, local area networks (LANs), wide area networks (WANs), wireless network, and network security. Students carry out experiments using modern hardware and software networking tools.
- Credit Hours:** 2 credits with 1 class hour and 2 lab hours
- Prerequisites:** EMT 1250 and EMT 2370
- Textbook:** Behrouz A. Forouzan, *Data Communications and Networking, 5th ed.*, ISBN: 978-0-07-337622-6, 2012.
- References:** Andrew S. Tanenbaum and David J. Wetherall, *Computer Networks (5th Edition)*, Prentice Hall, ISBN-10: 0132126958, ISBN-13: 978-0132126953, 2010.
- Douglas E. Comer, *Computer Networks and Internet (5th Edition)*, Prentice Hall, ISBN-10: 0136066984, 2009.
- James F. Kurose and Keith W. Ross, *Computer Networking: A Top-Down Approach (5th Edition)*, Addison Wesley, ISBN-10: 0136079679, 2009.
- Larry L. Peterson and Bruce S. Davie, *Computer Networks: A Systems Approach (5th Edition)*, The Morgan Kaufmann Series in Networking, ISBN-10: 0123850592, 2011 (4th Edition: ISBN-10: 0123705487, 2007)
- Softwares for Lab:** Commercial, free and open-source software will be used in the lab experiments. Proprietary software with purchased licenses are installed in the

computers in the lab. Links to download free and open-source softwares will be posted on the Blackboard.

Grading Policy:	Attendance	10%
	Lab	20%
	Quizzes	20%
	Midterm Exam	20%
	Final Exam, Course Project & Extra Credits	30%

A: 93~100	A-: 90~92.99	B+: 87~89.99	B: 83~86.99
B-: 80~82.99	C+: 77~79.99	C: 70~76.99	D: 60~69.99

Attendance:

- Under CUNY mandate, attendance in each class is required.
- At the beginning of each class, the instructor will make a roll call of all the student names to check the attendance. Any lateness **MUST** be reported to the instructor by the students before the class is dismissed. A name without on-time attendance nor reported lateness will be considered as **absence**.
- 2 lateness will be considered equally as a absence.
- Final attendance score without any lateness nor absence record will be 100pts. Each lateness will lead to 15 point loss, and each absence will lead to 30 point loss in the final attendance score until the attendance score hits zero.
- Being absent for more than **3 times** or being late for more than **6 times** in a semester, a **WU** or **F** grade will be granted during or after the semester.
- Any absence due to emergencies (e.g., emergency medical condition or no-fault legal crisis) needs to be notified to the instructor. Excused absences can **ONLY** be considered with signed explanatory notes from proper party with proper authority.

Lab Reports:

- All lab reports have to be submitted **INDIVIDUALLY** through the Blackboard.
- Any late due lab report will be graded as **zero**.
- Additional requirements on the format and content of the lab report will be posted on the Blackboard. Please read carefully.

Quizzes and Exams:

- Quizzes will be given at the beginning of a class. They will cover previous lectures, labs and homework assignments.
- **NO** any make-up test will be given for quizzes, Midterm and Final exams for any reason. Please be present and on time!

- All quiz scores will be equally contributed to the final grade.

Homework:

- Homework will be assigned during the semester.
- 5 Extra Credits will be granted for each timely-due homework, and only 2.5 Extra Credits will be given for late due homework.
- No homework will be accepted after the homework solution is released.
- Copying homework is zero tolerance! **Both parties involved copying homework will have no any credit for the homework!**
- Only **Three** late due are allowed at maximum in a semester. All late due homework beyond three late dues will not be accepted.
- No homework will be accepted after the semester ends.

Extra Credits:

- Extra Credits will be offered for completely filling the *Learning Log* after each class.
- Extra Credits may be offered for certain other additional work or performance that are related to the class, such as extra homework or expanded project.
- All extra credits will be counted with final exam score.

Conduct Code: Cell phone ringing and any other distracting and disruptive behavior such as talk loudly without permission are absolutely prohibited and may cause yourself being expelled from the class. Any activity that threatens the college academic integrity will result in a disciplinary action. Please refer to the Student Handbook and the Catalog of New York City College of Technology for a full listing of Student Code of Conduct, Classroom Behavior Guidelines and Academic Integrity Rules.

Computer Usage: Student can do lab assignments on the lab computers or his own laptops. Students must use the Blackboard during the semester.

Library Usage: Students are encouraged to use the library for supplementary resources of the lectures and textbook.

Class Success Tips:

- 1). **Take complete notes** during lectures, and review them thoroughly before you forget.
- 2). **Study in groups!** Studies have shown that students who study in a group perform better than alone. So find your study buddies!
- 3). **Do the lab and homework**, be prepared for the pop-up quizzes, and seek help immediately for any difficulty. Don't wait until the night

before the test or the due date of the homework.

- 4). Speak up if you have questions or concerns, be it in class, during office hours, or via email.
- 5). Work through the example problems step by step and try some related problems.
- 6). Don't assume every concept can be crystal clear to you just after a single reading. More than one reading of the material will be necessary.
- 7). Use Wikipedia and the references therein, instead of Google, as the first stop when you do research.
- 8). Students who are failing in the course may consider officially withdrawing on or before the Withdrawal Date to avoid an 'F' or 'WU' grade.
- 9). Use the tutoring service and other assistances provided by the college: **Tech Learning Center** (V-217), **Student Support Services** (A-237), **The Counseling Center** (N-108).
- 9). **Make extra credits!** A variety of opportunities to make extra credits will be announced during the class. Grasp them and make some extra credits! You will find out how beneficial they could be to your final grade.

Email:

All email to the instructor are suggested to be from an academic email account. Using any other public email account may cause email loss or rejection. Please always include "**EMT 2455**" in the subject line of your email.

Note:

This syllabus is subject to change.

**Lecture
Topics:**

Ch1. Introduction

- Introduction to communication and computer networks, History of the Internet
- ISO OSI and TCP/IP models

Ch2. Data & Signals, Physical Layer

- Analog signals: frequency, wavelength, phase
- Digital signals: bit length, bit rate, bits and bauds
- Baseband and broadband
- Simplex, duplex, multiplexing
- Digital and analog transmission
- transmission impairments, attenuation, SNR, dB
- Shannon's Theorem, Nyquist's Theorem, Nyquist's rate
- Data communication parameters: throughput, latency, jitter, channel capacity
- Bandwidth utilization
- Network topology
- Structural cabling system
- Fiber optics, submarine communication cables
- Basics of WiFi and WAN

Ch3. Data Link Layer

- MAC
- Error detection
- Ethernet: protocol, packet, cables

Ch4. Network Layer

- ARP
- IP Addressing: IPv4, IPv6, subnetting, supernetting, CIDR

Optional: Ch5. Transport Layer

- TCP and UDP

Note:

This list is subject to change without prior announcement.