

# **CSE 489/589**

## **Modern Networking Concepts**

**Yaxiong Xie**

**Department of Computer Science and Engineering**  
**University at Buffalo, SUNY**

# Today's Agenda

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- ❖ A brief overview of the course
  - Introduction of the Basic Information
  - Prerequisites
  - Grading Policies
  - Administrative aspects

# Course Instructor

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- ❖ Instructor: Yaxiong Xie, (Assistant Professor) Wireless Systems, Wireless Sensing, Mobile Systems, IoT, Next Generation Network
- ❖ Class Piazza:
  - Link: <https://piazza.com/buffalo/spring2025/cse4589>
  - Access Code: **li6502uppqm**
  - You should find it under the Announcements tab in UBLearns Brightspace.
- ❖ Email (First contact Instructors on Piazza): [yaxiongx@buffalo.edu](mailto:yaxiongx@buffalo.edu)
- ❖ Office: Davis Hall 321
- ❖ Office hours:
  - Tuesday 4:00 PM – 5:00 PM, in-person or Zoom
  - Thursday 4:00 PM – 5:00 PM, in-person or Zoom

# Grading: Academic Honesty

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- ❖ **Zero tolerance** on cheating/plagiarism:
  - Must fully understand the [Academic Integrity \(AI\) policy](#)
  - Fail the course on any homework assignment/lab, project, or exam even **for first attempt**, & report to the department.
  - May result in having a note on your transcript or expulsion
- ❖ Group study/discussion is encouraged, but the submission **must be your own work (except when teaming is explicitly allowed e.g, for a group project)**.
- ❖ **Students who share their work with others** are as guilty as those receiving the material.

# Important URLs

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- ❖ Use the class Piazza for questions regarding almost anything, including announcement, homework, lab and project assignments:

<https://piazza.com/buffalo/spring2025/cse4589>

- Make sure you receive email notifications for every new post/comment
  - Post in the right category
  - Mark a questions as “Resolved” when it is resolved
- ❖ Course content such as lecture slides can be found on course website
    - [https://xieyaxiongly.github.io/CSE\\_589\\_Spring\\_25/](https://xieyaxiongly.github.io/CSE_589_Spring_25/)

# Course Website

❖ Course content such as lecture slides can be found on course website

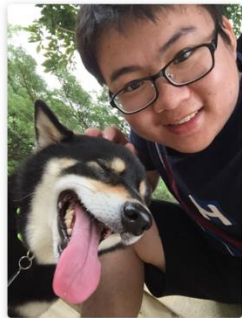
- [https://xiexiangfly.github.io/CSE\\_589\\_Spring\\_25/](https://xiexiangfly.github.io/CSE_589_Spring_25/) How to find it?



[About](#) [Publications](#) [Group](#) [Teaching](#) ☾

## Yaxiong Xie

Assistant Professor, Department of Computer Science and Engineering



I am an Assistant Professor in the [Department of Computer Science and Engineering \(CSE\)](#) at the [University at Buffalo, SUNY](#). I am leading the [NEXT-generation MOBILE-network \(NEMO\) lab](#) @ UB.

Before joining UB, I was a postdoctoral research associate at Princeton University, working with Prof. Kyle Jamieson and Prof. Jennifer Rexford. I received my Ph.D. from Nanyang Technological University (NTU), under supervision of Prof. Mo Li.

I am the author of two open-source research tool: [NG-Scope](#) and [Atheros-CSI-Tool](#).

Yaxiong Xie

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## Teaching

CSE489/589 Modern Networking Concepts



Spring 2024



Spring 2025

# Course Website


- ❖ Course content such as lecture slides can be found on course website

- [https://xiexiaiongly.github.io/CSE\\_589\\_Spring\\_25/](https://xiexiaiongly.github.io/CSE_589_Spring_25/)

The image displays two screenshots of the course website for CSE489/589. The left screenshot shows the main course page with the 'Calendar' link highlighted in a red box. The right screenshot shows the calendar page with a list of lecture and section dates and topics.

**CSE489/589** | Search CSE489/589 | Yaxiong Xie

**Modern Networking Concepts**  
Spring 2025, University at Buffalo

**Instructor:**  
 **Yaxiong Xie**  
yaxiongx@buffalo.edu  
**Office Hours** Tuesday & Thursday 4:00pm - 5:00pm  
[Schedule an appointment](#)

**Course Updates**  
All updates, Programming Assignments, Homeworks, and Wireshark Labs are updated on Piazza. We will also be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza.  
Please join at the following link: <https://piazza.com/buffalo/spring2025/cse4589/info>  
Access Code: You should find it under the Announcements tab in UBLearn Brightspace.

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**Calendar**

**Week 1 Jan 20 - Jan 26**

Jan 23:	<b>LECTURE</b>	Course Overview	slides
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**Week 2 Jan 27 - Feb 2**

Jan 28:	<b>LECTURE</b>	Introduction of Networks (part 1)	Slides
Jan 30:	<b>LECTURE</b>	Introduction of Networks (part 2)	slides

**Week 3 Feb 3 - Feb 9**

Feb 4:	<b>SECTION</b>	Introduction of Networks (part 3)	slides
Feb 6:	<b>SECTION</b>	Application Layer (part 1)	slides

**Week 4 Feb 10 - Feb 16**

Feb 11:	<b>SECTION</b>	Application Layer (part 2)	slides
Feb 13:	<b>SECTION</b>	Application Layer (part 3)	slides

# What is the course about?

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MTU P2P 10BaseT WAN IMAP TDM  
ESP TCP TDM ACM PCM NIC ARP  
DES QoS EIA  
MTU RTP MAN FDDI DHCP  
HTTP MANET RFC IP EGP PDU  
PIM ICMP HTTP RPF T3 WAP DCE  
ABR ATM MAC OSPF MOSPF IGMP CGI  
SMTP UDP CDMA DSL IPv6 CIDR  
IRSG PSTN LAN BGP VBR FDM CRC  
IGMP PPP NAT CSMA/CD XNS  
MIB ISP NAT CSMA/CD RIP COPS  
CBT TLI DDN SVC SNMP L2CAP SLIP OC12  
AUI RTSP BNC NIS DNS ARQ SONET 10Base3



# What is the course about?

 Meta

Google



ChatGPT

  
airbnb

LinkedIn

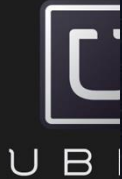


  
UBER

amazon

 TikTok

# *INTERNET*



PT

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# What you'd achieve from this course

- ❖ Learn the **fundamentals** of Internet and general computer networking concepts
  - The technologies that make networking possible.
  - Software architectures integrating the technologies to build a computer network, the Internet in particular.
  - Network programming.
  - Shortcomings and challenges of current Internet architecture (technologically, politically).
- ❖ Have fun!

# What you will not learn from this course

- ❖ A lot!!!
- ❖ Why?
  - There are many things we don't know
  - The field is enormous
  - Technologies evolve super-fast

# Prerequisites

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- ❖ Elementary calculus and probability
- ❖ Elementary computer architecture, operating system, data structures and algorithms
- ❖ Basic Communication Theory (helpful)
- ❖ **Strong C / C++ programming skills** in Unix/Linux
  - You need to be proficient in order to do the project assignments!
  - No other programming language will be allowed!
  - No other OS will be allowed!

# Course Material

## ❖ Textbook

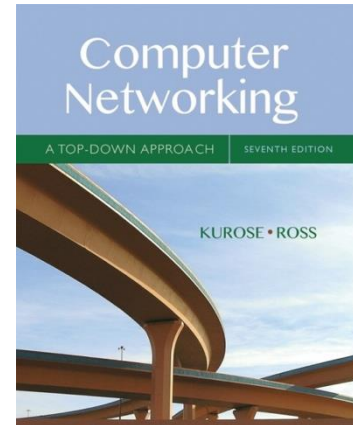
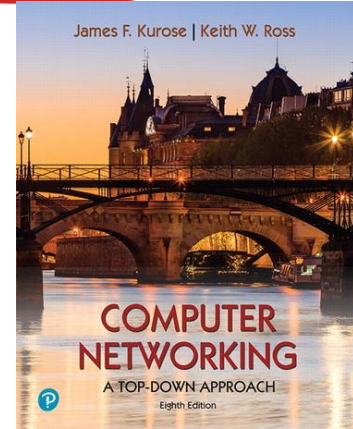
- James F. F. Kurose and Keith W. Ross, "**Computer Networking: A Top-Down Approach**", 8th edition, 2020
- [https://gaia.cs.umass.edu/kurose\\_ross/index.php](https://gaia.cs.umass.edu/kurose_ross/index.php)

## ❖ Recommended reference

- James F. F. Kurose and Keith W. Ross, "**Computer Networking: A Top-Down Approach**", 7th edition, 2017
- W. Richard Stevens, "**UNIX Network Programming : Networking APIs : Sockets and XTI : Volume 1, Second Edition**", Prentice Hall.

## ❖ Other references (including slides)

- Piazza and UB Learns



# Lectures

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- ❖ Will follow the textbook
  - Read relevant chapters before and after lectures
  - Preview the slides (available most of the time before each class)
- ❖ Lectures will be recorded and available at UBLearns (I hope)

# Grading: Academic Honesty

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- ❖ **Zero tolerance** on cheating/plagiarism:
  - Must fully understand the [Academic Integrity \(AI\) policy](#)
  - Fail the course on any homework assignment/lab, project, or exam even **for first attempt**, & report to the department.
  - May result in having a note on your transcript or expulsion
- ❖ Group study/discussion is encouraged, but the submission **must be your own work (except when teaming is explicitly allowed e.g, for a group project)**.
- ❖ **Students who share their work with others** are as guilty as those receiving the material.



# Grading Policy

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- ❖ 4 Homework
- ❖ 4 Wireshark Labs
- ❖ Programming Assignments (PAs)
- ❖ Mid term and Final

# Homework and Wireshark Labs

- ❖ 4 Homework : Best 3 towards final grade (4% each)
- ❖ 4 Wireshark Labs : 2%
- ❖ All done **individually**
- ❖ Counts **20%** towards the final grade.
- ❖ Submitted **electronically**, **late** submissions for up to 7 days are accepted
  - ❖ With a fixed daily penalty of 10 out of 100 points
  - ❖ Latest submission (7 days late) will receive at most 30 points even if it's all correct; 0 points if more than 7 days late;

# Programming Assignments (Projects)

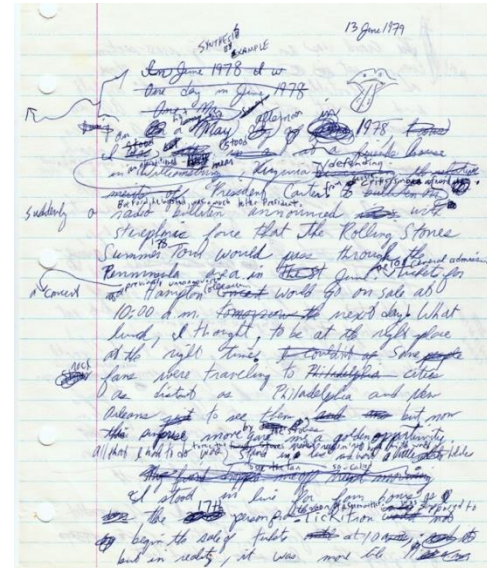
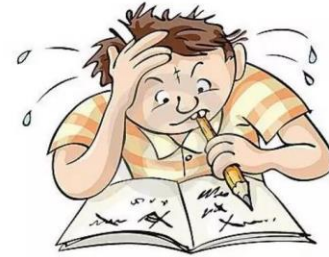
- ❖ Programming Assignments
  - 40%
  - The details of the PA will be released soon.
- ❖ Projects can be done in a group of 2 students, (or individually).
- ❖ Late submissions will receive penalties.

# More on Grading Policy (Tentative)

- ❖ Mid-term Exam (20%)
  - March 13<sup>th</sup>
  - (right before Spring Break)
- ❖ Final Exam (20%)
  - 5/9/2025, Friday, 7:15PM – 10:15PM
- ❖ No make up exam will be given without a **valid excuse**

# No handwritten work

- ❖ All assignments and exams must be typed.
- ❖ Handwritten work is not allowed.



# Grade Expectation

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- ❖ On the curve
- ❖ Just for reference:
  - **A**: top 15-20%
  - **A-**: next 10-15%
  - **B+, B, B-**: next 25-40%
  - **C+, C, C-**: next 10-20%
  - **D and below**: you don't want to know
- ❖ We reserve the right to assign grades based on the overall performance.

# No lame excuses, please!!!

- ❖ I have to go home early, Can I take the exam on December 1st? (no long valid)
- ❖ I had a fight with my girlfriend/boyfriend.
- ❖ I've studied very hard, I understood the stuff very well, but I got a C- please consider giving an A-.
- ❖ I will graduate this semester and won't be able to graduate unless I get at least a B+.

# Academic Honesty

Important Enough to be Repeated

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- ❖ **Zero tolerance** on cheating/plagiarism:
  - Fail the course on any homework assignment/lab, project, or exam even **for first attempt**, & report to the department
  - Consult the [University Code of Conduct](#) for details on other consequences of academic misconduct
- ❖ Group study/discussion is encouraged, but the submission **must be your own work, or in the case of a team programming project, your teammate's work.**
- ❖ Team members are **equally** responsible for any AI violation! (don't let your teammate violate AI policy)
- ❖ For individual assignments, students who share their work are equally responsible for AI violation as those receiving the material.



# More on Academic Honesty

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- ❖ Homework
  - No collaboration across teams!
  - Use of reference material is allowed as long as you explicitly state the reference
    - Exception: **hw/lab solutions from past years or Internet**
- ❖ Course Projects:
  - Discussion of ideas is welcome but **no sharing of code!**
  - Use of code found online is not allowed even you explicitly state the reference
  - We will use **MOSS** to detect cheating.
- ❖ No lame excuses!
  - I did not know/I was not sure/I forgot

# Use of AI Tools

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- ❖ **No use of AI Tools for any submissions**
  - AI Tools like ChatGPT, Google Gemini, Claude, etc. are not allowed.
- ❖ They can be used to understand the concepts and for clarifications.
- ❖ Use of AI Tools for the submissions in any class work
  - Homeworks/Wireshark Labs/Programming Assignments

**will not be acceptable.**

# How to do well?

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- ❖ Preview the textbook, attend lectures and review notes
- ❖ Start **early** on homework/labs/programming assignments
- ❖ Do homework, labs and projects yourself
- ❖ Use Piazza often and effectively
- ❖ Ask TAs questions during office hours

# Where Do I Ask Questions About

- ❖ Lectures
  - Piazza
  - Instructors (office hours, email)
- ❖ Homework and Labs
  - Piazza
  - TAs (office hours, email)
  - Instructor (office hours, email)
- ❖ Programming Assignments
  - Piazza
  - **Graders** (office hours, email)
  - TAs (office hours, email)

Questions?