TCN 5010 - U01 (19243)– Telecommunications Technology and Applications
Spring 2023

Instructor:	Xuyu Wang
Email:	xuywang@fiu.edu
Place:	Green Library 166
Lecture Time:	Monday, 12:30PM - 3:10PM
Office	CASE 388

Office Hours: Monday, 3:20 pm-4:50 pm with the zoom link with https://fiu.zoom.us/j/7821251111 (Passcode: jT6QUx), or by appointment.

Textbook: **Required Text**
No textbook is required

Recommended Texts & Other Readings
Computer Networking: A Top-Down Approach Featuring the Internet, 7rd edition, by James F. Kurose and Keith W. Ross.
Andrea Goldsmith. 2005. Wireless Communications. Cambridge University Press, New York, NY, USA.
Wireless Communications: Principles and Practice by Theodore S. Rappaport, Prentice Hall

Course slides, assignments and other artifacts will be available to you through Canvas.

Course Content:

This course provides students with telecommunication fundamentals with emphasis on higher level protocols, wireless networks, and applications. Also, this course focuses on exploiting deep learning methods for data networking, wireless communications (e.g., signal and modulation, and coding), and security. Topics of this course include the state-of-the-art telecommunication techniques and applications (e.g. data networks, network and IoT security, edge computing, video streaming/analysis, federated learning, wireless systems/sensing, LTE/5G, and AI security) as well as next generation telecommunication technologies (e.g., quantum and semantic communications, satellite networks, and metaverse).

Course Objectives:
1. To gain breadth and depth of knowledge of data network protocol design
2. To develop state-of-the-art knowledge of advanced topics in computer networking, wireless networks, and security
3. To use deep learning to design computer networking, wireless networks, and security
4. To provide programming experience in telecommunication technology and applications

TENTATIVE SCHEDULE SUBJECT TO CHANGE

Week	Topics and Major Content
1	Syllabus, Introduction (AI and Telecommunication Networks)
2	Martin Luther King Day (No Class)
3	TCP/IP Review
4	Network and IoT Security
5	AI for Networking
6	Edge Computing (e.g., Video Streaming/Analysis)
7	Federated Learning on Edge
8	Spring Break (No Class)
9	AI for Wireless (Modulation and Coding)
10	Wi-Fi and Wireless Sensing Systems
11	Wireless IoT Systems (e.g., LoRa)
12	LTE/5G Systems
13	New Techniques-1 (e.g., Quantum and Semantic Communications)
14	New Techniques-2 (e.g., Satellite, ORAN, Metaverse)
15	AI Security and Pre-Final Review

Tentative Grading Policy (subject to change during the semester):

Final Exam	30%
Homework Assignments	30%
Project	35%
Attendance	5%

Grading Breakdown (%):

A = 93-100	C = 70-76
A- = 90-92	D = 60-69
B+ = 87-89	F = 59 or below
B = 83-86	
B- = 80-82	
C+ = 77-79	

Submission Rules:

Each submission needs to be in an **electronic version** (through Canvas). Any file needs be named according to one of the following formats (depending on the submission type). **Please do NOT use txt format**. **Word or PDF** format is preferable.

TCN5010_homework#_name

TCN5010_project#_name,

For example, if James Green is submitting project, the file name of the submission should be TCN5010_homework_James_Green. **On the first page of each submitted document, please always list your name as the author**. Please note: if the attachment is not according to proper format as stated above, it will not be accepted.

Late submission will be penalized by the following rules:
- o Second day submission: **20% off** the assignment grade;
- o Third day submission: **50% off** the assignment grade;
- o After the third day: **100% off** the assignment grade.

Project

Two students can work together for the final project.

Policies

Please review the FIU's Policies webpage. The policies webpage contains essential information regarding guidelines relevant to all courses at FIU, as well as additional information about acceptable netiquette for online courses. For additional information, please visit FIU's Policy and Procedure Library.

As a member of the FIU community you are expected to be knowledgeable about the behavioral expectations set forth in the FIU Student Conduct and Honor Code.

Accessibility and Accommodation

The Disability Resource Center collaborates with students, faculty, staff, and community members to create diverse learning environments that are usable, equitable, inclusive, and sustainable. The DRC provides FIU students with disabilities the necessary support to successfully complete their education and participate in activities available to all students. If you have a diagnosed disability and plan to utilize academic accommodations, please contact the Center at 305-348-3532 or visit them at the Graham Center GC 190.

For additional assistance please contact FIU's Disability Resource Center.

Please visit our ADA Compliance webpage for additional information about accessibility involving the tools used in this course.

Academic Misconduct Statement

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Conduct and Honor Code. Academic Misconduct includes:

Cheating

- The unauthorized use of any materials, information, study aids or assistance from another person on any academic assignment or exercise, unless explicitly authorized by the course Instructor;
- Assisting another student in the unauthorized use of any materials, information, study aids, unless explicitly authorized by the Instructor; and
- Having a substitute complete any academic assignment or completing an academic assignment for someone else, either paid or unpaid; and

Plagiarism

- The deliberate use and appropriation of another are work without any indication of the source and the representation of such work as the Student's own.
- Assisting another student in the deliberate use and appropriation of another's work without any indication of the source and the representation of such work as the student's own.

Learn more about the academic integrity policies and procedures as well as student resources that can help you prepare for a successful semester.

Panthers Care & Counseling and Psychological Services (CAPS)

If you are looking for help for yourself or a fellow classmate, Panthers Care encourages you to express any concerns you may come across as it relates to any personal behavior concerns or worries you have, for the classmate's well-being or yours; you are encouraged to share your concerns with FIU's Panthers Care website.

Counseling and Psychological Services (CAPS) offers free and confidential help for anxiety, depression, stress, and other concerns that life brings. Professional counselors are available for same-day appointments. Don't wait to call (305) 348-2277 to set up a time to talk or visit the online self-help portal.