Computer Communications

EEL4598 Sections: CAMP, OVER (Live/Synchronous)
EEL5718 Sections: CAMP, OVER (Live/Synchronous)
EDGE EEL5718 Sections: 1FE2, 2FED (Online/Asynchronous)

Class Periods: Tuesday, Period 4 (12:30pm-1:35pm)
Thursday, Periods 4-5 (12:30pm-2:40pm)
Location: NEB 201
Academic Term: Summer C 2024

Instructor of record:
Name: Professor Janise McNair
Email Address: Please use Canvas mail tool.
Office Phone Number: 352-392-2629 (prefer Canvas email)
Office Hours: N/A

Teaching Assistant/Lecturer:
Name: Pavan Mangipudi
Email Address: Please use Canvas mail tool.
Office Hours: The hour immediately following the lecture, and by appointment.
Office: MALA 3000 (Text first using number posted in Canvas)

Teaching Assistant:
Sharon Boamah
Email Address: Please use Canvas mail tool.
Office Hours: See Canvas listing.

Course Description
This course introduces the principles and practice of computer networking, emphasizing data communication and the lower layers of the OSI and TCP/IP protocol architectures. Includes the design of data communication networks: modems, terminals, error control, multiplexing, message switching, and data concentration.

Course Pre-Requisites / Co-Requisites

EEL4598 Pre-req: EEL 3834 or COP 3503C or COP 3504C or COP 2274 or equivalent, all with minimum grades C and junior standing or higher.

EEL5718 Pre-req: Communication Systems and Components or equivalent and graduate level standing. Students may not take this course if they have already taken EEL4598.

Course Objectives
Computer communications networks are the key infrastructures of today's information society. They contribute to the correct operations of many critical services (from healthcare to finance to transportation to power to entertainment). A computer communication network consists of a set of equipment, facilities, architectures and protocols that enable the transfer of information between two or more chips, devices, machines and/or users.

In this course, students will learn about the basic operation and design of various computer communications systems. The students will apply their knowledge of advanced mathematics, basic programming, and communications systems to understand and evaluate the performance of modern and next generation computer communication networks.
These objectives will be accomplished through:
1. Examining the operation of networks for services, such as transport of voice, data, image, and video.
2. Designing and conducting experiments using professional computer engineering industry tools

3. Applying mathematics (including probability and statistics, discrete math) and engineering to evaluate performance and compare networked systems.
4. Developing techniques and skills necessary for applying computer communications in practice.

Materials and Supply Fees
None

EEL4598 - Professional Component (ABET):
This course consists of 3 credits of Engineering Science

EEL4598 - Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	
3. An ability to communicate effectively with a range of audiences	Medium
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	High
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	High

Required Textbooks and Software (not required)
- A. Leon-Garcia and I. Widjaja, Communication Networks, McGraw-Hill, 2nd edition, 2003.
  ISBN number: ISBN-10: 007246352X or ISBN-13: 978-007246352
  The textbook is from 2003, but it has good fundamentals discussions. It will be supplemented with up-to-date IEEE and ACM articles and book chapters.
- References to articles and chapters will be provided through Canvas

Recommended Materials (not required)
- Other textbook material will be provided through the UF Ares electronic library links in Canvas.

Course Schedule
Week 1: Introduction and Overview; Layered System Model
Week 2: Digital Transmission Fundamentals
Week 3: Line Coding
Week 4: Frames and Errors
Week 5: Error control
Week 6: Error control: ARQ protocols
Week 7: *Summer Break*
Week 8: The Internet
Week 9: Mid Term exam
Week 10: IP addressing
Week 11: Routing
Week 12: Special Topics: Software Defined Networking
Week 13: Project Demonstrations

Class Organization

This course in summer 2024 will have campus (in-person) sections and EDGE (distance-learning online) sections. Every lecture will be recorded and posted online.

- **Beginning in the second week, Tuesday lectures** will be **online only** and **pre-recorded**. Tuesday lectures will be recorded by Prof McNair. The lectures must be viewed by Wednesday.
  - o Campus section students are expected to watch the Tuesday lectures by Wednesday of each week.
  - o EDGE students are expected to watch the Tuesday lectures within 7 days, i.e., by the following Tuesday.
  - o Class participation quizzes will be given about textbook readings and recorded lecture content. (EDGE students will be given a one-week extension for all assignments, including the quizzes.)
- **Thursday lectures** will be **hybrid (live in-person and online)**. Thursday lectures will be given by the TA and will have a technology discussion, followed by discussion of concepts and examples from lectures and the textbook.
- **Midterm Exam.** There is one midterm exam.
  - o **Campus section students must take the exam in person.** If for some reason, you cannot take it in person during the summer, you can request to take the exam during the first week of fall classes in August. This will delay the posting of your grade in the course on your transcript to September.
  - o **EDGE section students can take the exam in person or online.** An online proctoring system has been purchased to proctor online EDGE exams. The exam will require EDGE students to have access to a working webcam, a non-work computer, and a stable internet connection.

Online Course Recording

Our class sessions, including group presentations, may be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate verbally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Attendance Policy, Class Expectations, and Make-Up Policy

- For regular lectures, in-class attendance is not required.
- For the midterm exam, in-person attendance is required for students enrolled in Section CAMP (Class Number 11247 or Class Number 11202).
- For EDGE section students, an online exam proctor service has been purchased for taking the exam online.
- **Undergraduate section attendance**:
  - o Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/
- **Graduate section attendance:**
  - o Excused absences must be consistent with university policies in the Graduate Catalog (https://catalog.ufl.edu/graduate/regulations) and require appropriate documentation. Additional information can be found here: https://gradcatalog.ufl.edu/graduate/regulations/

Other Course Policies

- o **Check Canvas or Gatorlink Email daily for announcements and updates**
  - ▪ It is the student's responsibility to check Canvas regularly for discussion items in Canvas. Set Canvas to send announcements to your gatorlink email and check your email regularly to receive announcements.
- o **Assignments are an Individual Effort**

- All assignments are assumed to be an individual effort unless otherwise specified by the instructor.

- o **Regular Participation is Expected:**
    - All students are expected to read the textbook section and view the pre-recorded lectures for each week by Wednesday. Class quizzes about pre-recorded lectures and/or the textbook reading assignments may be assigned on Thursdays.
    - A class participation grade will be assessed for each student based on regular (not perfect) participation in class quizzes, surveys, and discussions, with deductions for disruptive behavior.
    - Every student (including EDGE students) **must participate in a course project group.** It is expected that each student will be responsive to and communicate within their group and will behave responsibly in group participation. Group participation assessments are part of the class participation grade.
- o **Assignment Submission.**
    - Electronic submission of homework and assignments to the course Canvas site is required.
    - Lab demos will be recorded and posted on in the cloud.
    - Final project group presentations will be live on Zoom.
- o **Access to a computer programming and/or simulation tool is required.**
    - Open-source software will be used for simulator/emulator assignments. You must have a computer where you can install and use new software.
    - For EEL5718, your computer must be able to support virtual machines to run project simulations.
    - EDGE section quizzes and midterm exam will be on Canvas using Honorlock.
        - Honorlock requires access to your computer for online proctoring during the exam.
        - Honorlock Guidelines can be found in Canvas Files/Honorlock
- o **Deadlines:**
    - No make-ups for missing homework or in-class assignments due to **unexcused** absences.
    - Late homework may be accepted **before solutions are posted**. A 5% daily penalty may be applied.
    - There will be no make-ups for missed exams due to **unexcused** absences.
      Excused absences are determined by the undergraduate catalog and require documentation (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) .
    - **EDGE students will have a one-week automatic extension for all deadlines**, except for dates that go beyond the end date of the summer term. Extensions for more than one week require prior approval by instructor.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework (4)	100 each	20%
Labs (2)	100 each	20%
Class Participation (5)	10 each	10%
Midterm Exam	100	35%
Group Presentation	100	15%
Total		100%

Grading Policy

Percent	Grade	Grade Points
91.0 - 100	A	4.00
89.0 - 90.9	A-	3.67
87.0 - 88.9	B+	3.33
80.0 - 86.9	B	3.00
79.0 - 79.9	B-	2.67
77.0 - 78.9	C+	2.33
70.0 - 76.9	C	2.00

69.0 - 69.9	C-	1.67
67.0 - 68.9	D+	1.33
60 - 66.9	D	1.00
59.0 - 59.9	D-	0.67
0 – 58.9	E	0.00

Information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Students Requiring Accommodations
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/get-started/) It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

In-Class Recording
Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates

academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Graduate/Undergraduate Program Coordinator
• Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@ufl.edu
• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:

Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://career.ufl.edu.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using UF libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*: https://care.dso.ufl.edu

On-Line Students Complaints*: http://www.distance.ufl.edu/student-complaint-process.