

Computer Communications

EEL4598 Sections: CAMP, OVER (Live/Synchronous)

EEL5718 Sections: CAMP, OVER (Live/Synchronous)

EDGE EEL5718 Sections: 1FE2, 2FED (EDGE, 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 2022

Instructor:

Name: Dr. Janise McNair

Email Address: Contact through Canvas mail tool.

Office Phone Number: 352-392-2629

Office Hours: The hour immediately following lecture, or by appointment

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Name: To be announced

Email Address: Contact through Canvas mail tool.

Office Hours: To be determined

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. (3 credits)

Course Pre-Requisites / Co-Requisites

EEL5718 Pre-req: Communication Systems and Components or equivalent and graduate level standing.

EEL4598 Pre-req: EEL 3834 or COP 3503C or COP 3504C or COP 2274 or equivalent, and junior standing or higher

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 is 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 a computer communications system. The students will apply their knowledge of advanced mathematics, basic programming and communications 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 telecommunication networks for services such as voice, data, image, and video transport.
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 IEEE and ACM articles and other book 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: Internet Topology, Packet Switching and Routing

Week 3: Internet Protocol (IP)

Week 4: Software Defined Networks Basics

Week 5: Software Defined Networks Research

Week 6: Review / Exam 1

Campus Section: In-person exam required

EDGE Section: Honorlock

Week 7: **Summer Break**

Week 8: Local Area Networks – Operations and Topology

Week 9: Line Coding and Error Control

Week 10: Ethernet

Week 11: Gigabit Ethernet

Week 12: Special Topics - Smart Grid Networks, Time-Triggered Ethernet

Week 13: Project Demonstrations

*It is expected that on campus project groups will give in-person presentations, while EDGE project groups will provide recorded presentations. All groups will provide recorded lab demonstrations via either youtube.com or the zoom cloud and will provide in-person or **live-on-zoom** final course project demonstrations. Schedule to be determined.*

Online Course Recording

Our class sessions 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 orally 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

The class may at times be presented online using Zoom and requires students to have access to a working webcam and stable internet connection.

Excused absences must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require documentation.

Other Course Policies

- **Regular Participation is Expected:**
 - A class participation grade will be assessed for each student based on regular (not perfect) participation for in-class assignments and discussions, as well as deductions for disruptive behavior.
 - It is expected that each student will be responsive to and will behave responsibly in group participation. A group participation grade will be assessed.
- **Assignment Submission.**
 - Electronic submission of homework and assignments to the course Canvas site is required.
 - Lab demos will be recorded and posted on youtube or zoom cloud.
 - Final project group demonstrations will be **in-person or live on Zoom**.
- **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. Virtual machines will be used in EEL5718.
 - On campus sections' quizzes and midterm exam are expected to be in-person during classtime.
 - All quizzes will be on Honorlock. On campus exams are **in-person**.
 - **EDGE sections'** midterm exam will be on Honorlock.
 - Honorlock requires access to your computer for proctoring during the exam.
 - Honorlock Guidelines: <https://dce.ufl.edu/media/dceufledu/pdfs/Honorlock-Student-Exam-Preparation-Information.pdf>
- **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% penalty per day 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>).
- **Individual Effort**
 - All assignments are assumed to be an individual effort unless otherwise specified by the instructor.
- **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.

EDGE Student Policies (This list applies only to those registered in an EDGE section)

- **EDGE students will have a one-week automatic extension for all deadlines**, except for dates beyond the end date of the summer term. Extensions for more than one week require prior approval by instructor.
- **EDGE students are not required to attend the live lectures** but are expected to view the lectures within 7 days of the date they are first posted in Canvas.
- **EDGE Quizzes and Exams will be on Canvas using Honorlock**
 - Honorlock requires access to your computer for proctoring during the exam. Work computers may not allow this kind of access.

- Honorlock Guidelines: <https://dce.ufl.edu/media/dceufledu/pdfs/Honorlock-Student-Exam-Preparation-Information.pdf>

Evaluation of Grades

| Assignment | Total Points | Percentage of Final Grade |
|--|---------------------|----------------------------------|
| (Individual) Homework Worksheets/Quizzes (4) | 50 each | 15% |
| (Group) Labs and Presentations (3-4) | 100 each | 15% |
| (Individual) Class Participation | 100 each | 2.5% |
| (Individual) Group Participation | 100 each | 2.5% |
| (Individual) Midterm Exam | 100 | 35% |
| (Group) Course Project Demo | 100 | 20% |
| (Group) Course Project Final Report | 100 | 10% |
| 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 requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure 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.ua.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.ua.ufl.edu/public-results/>.

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/policies/student-honor-code-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 Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.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/services-resources/career-planning/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the 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>.