

## Computer Communications

EEL4598 Section#:2240

EEL5718 Sections: On Campus - 6152

**Class Periods:** Monday, Wednesday, Friday, Period 6 (12:50 PM - 1:40 PM)

**Location:** LAR 310

**Academic Term:** Fall 2019

### **Instructor**

- Name: Dr. Janise McNair
- Email Address: [mcnair@ece.ufl.edu](mailto:mcnair@ece.ufl.edu) (After class begins, please contact using Canvas Inbox.)
- Office Phone Number: 352-392-2629
- Office Hours: Monday and Wednesday 2pm-3pm

### **Teaching Assistants:**

- TBA
- Email address: Contact TA role using Canvas Inbox.

### **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: Communication Systems and Components or equivalent and graduate level standing.

EEL4598: Programming - EEL 3834, COP 2271 or other programming equivalent, junior or senior level standing

### **Course Objectives**

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 science and computer engineering to understand and evaluate the performance issues of modern and next generation computer communication networks.

These objectives will be accomplished through:

1. Discussion of modern and next generation technologies and standards.
2. Designing and conducting hands-on experiments with existing networks or simulation software
3. Applying mathematics and engineering to evaluate systems with performance metrics
4. Identifying, formulating and solving computer communication problems
5. Developing and using techniques, skills, and tools necessary for applying computer communications in practice.

### **Materials and Supply Fees**

None

### **Required Textbooks and Software**

- Title: Communication Networks
- Author: A. Leon-Garcia and I. Widjaja
- Publication date, edition, and publisher: 2003, 2<sup>nd</sup> edition, McGraw-Hill
- ISBN number: *ISBN-10:* 007246352X, *ISBN-13:* 978-007246352

### **Recommended Materials\***

**\*These textbooks are optional resources. They are available for 2-day reserve check-out in Marsten Science Library.**

- Title: Data and Computer Communications
- Author: W. Stallings
- Publication date, edition, and publisher: (Can use any edition) 2003 through 2011, Prentice Hall or 2013, Pearson
- ISBN number: *ISBN-10:* 0131292050 *ISBN-13:* 9780131392052

### ***Course Schedule***

- Week 1: Introduction, Overview and Layers; Chapters 1 and 2
- Week 2: Digital Transmission Fundamentals; Chapter 3, Sections 3.1-3.5, 3.7
- Week 3: Line Encoding and Modulation; Chapter 3, Sections 3.5-3.7
- Week 4: Frames, Error Detection and Correction; Chapter 3, Sections 3.8,3.9
- Week 5: Case Studies: Ethernet HDLC, IP
- Week 6: Medium Access Control Protocols; Chapter 6 Sections 6.1-6.2, 6.5
- Week 7: Evolving Ethernet (research paper)
- Week 8: ARQ Protocols, Chapter 5, Sections 5.1-5.3
- Week 9: Review and Exam 1 (Wednesday Night Exam)
- Week 10: Packet Switching and Routing; Chapter 7 Sections 7.1-7.5
- Week 11: IP, Subnets, and Supernets BGP Chapter 8 sections 8.1-8.3
- Week 12: Software Defined Networks (research paper)
- Week 13: Transport Control Protocol; (TCP); Chapter 8
- Week 14: Internet of Things
- Week 15: Project Work and Thanksgiving Holiday
- Week 16: Project Demonstrations Week

*It is expected that each project group will give an in-class presentation during the semester. Schedule to be determined.*

### ***Course Policies***

- **Assignment Submission.**
  - Electronic submission of homework and project assignments are required.
  - Upload to the course e-learning site in one of the following formats: PDF (preferred), MS Word, or Text
- **Access to a computer programming or simulation tool is required.**
  - Homework, quizzes and assignments may be done in e-learning, ns-3, Matlab, GENI, or other software.
  - Open source software will be used for simulator/emulator assignments.
- **Regular Participation is Expected:**
  - Perfect class attendance is not required, but regular participation is expected.
  - It is the student's responsibility to independently obtain missed material from classtime.
  - Excused absences require proper documentation and must be consistent with the university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>).
- **Deadlines:**
  - There will be no make-ups for homework or in-class assignments. Late homework may be accepted before solutions are posted, but a 10% penalty per day may be applied.
  - There will be no make-up exams except for excused absences (as determined by the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>)). Requires proper documentation.
- **Individual Effort**
  - All assignments are assumed to be an individual effort unless otherwise specified by the instructor.
- **Announcements and updates**
  - Each student must link their e-learning Inbox to your gatorlink email. You will need to check it regularly.
- **Class participation**
  - The class participation grade is assigned to each student to reflect attendance at student presentations, project group participation, and discussion participation, as well as deductions for disruptive behavior, tardiness, etc.

### *Evaluation of Grades:*

<b>Assignment</b>	<b>Percentage of Final Grade</b>
Homework and Simulation Exercises	10%
Midterm Exam	30%
Group Presentations	20%
Course Project(s)	30%
Class/Group Participation	10%
TOTAL	100%

### **5718 Versus 4598:**

Homework and Exams: 5718 will involve some additional advanced problems in homework and exams than 4598.

Projects: 5718 students will complete a semester-long simulation analysis project, while 4598 will have 2 to 3 smaller hands-on projects to complete during the semester.

### **Grading Policy:**

**NOTE: This grading scale does not include any curve that may be applied to the course.**

<b>Percent</b>	<b>Grade</b>	<b>Grade Points</b>
93 - 100	A	4.00
90 - 92.9	A-	3.67
87 - 89.9	B+	3.33
83 - 86.9	B	3.00
80 - 82.9	B-	2.67
77 - 79.9	C+	2.33
73 - 76.9	C	2.00
70 - 72.9	C-	1.67
67 - 69.9	D+	1.33
63 - 66.9	D	1.00
60 - 62.9	D-	0.67
0 - 59.9	E	0.00

Note that A “C-” will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: A “C-” average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement.

More 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 feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/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://www.dso.ufl.edu/scer/process/student-conduct-honor-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.

### ***Software Use***

All faculty, staff and student 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.

### ***Campus Resources:***

#### *Health and Wellness*

##### **U Matter, We Care:**

If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) or 352-392-1575 so that a team member can reach out to the student.

**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 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](mailto:Learning-support@ufl.edu).

<https://lss.at.ufl.edu/help.shtml>.

**Career Resource Center**, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

**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://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf).

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