

Wireless and Mobile Networks

EEL4599 Section #1B32

Class Periods: T | Period 7 (1:55 PM - 2:45 PM)

R | Period 7 - 8 (1:55 PM - 3:50 PM)

Location: MAE-A 327

Final Exam Period: 5/1/2019 @ 10:00 AM - 12:00 PM

Academic Term: Spring 2019

Instructor:

- Name: Janise McNair
- Email Address: mcnair@ece.ufl.edu (After class begins, please contact through Canvas.)
- Office Phone Number: 352-392-2629
- Office Hours: M,W 1130am-1pm

Teaching Assistants:

Please contact through the Canvas website

- TBD

Course Description

Senior-level study of wireless and mobile networks. Investigates telecommunication architectures and protocols for wireless sensor networks and wireless embedded systems; Wi-Fi and wireless local area networks; mobile ad-hoc networks; next generation cellular systems and satellite networks. (3 credit hours)

Course Pre-Requisites / Co-Requisites

EEL 3701C and junior or senior standing.

Course Objectives

In this course, students will learn about the basic operation and design of a wireless 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 advanced wireless networks.

These objectives will be accomplished through:

1. Discussion of modern and next generation technologies and standards.
2. Designing and conducting hands-on experiments, such as building a wireless network or network analysis 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: Optional: Can purchase additional devices for course project (< \$60).

Professional Component (ABET) - This course consists of 3 credits of Engineering Design;

Relation to Program Outcomes (ABET)

Engineering Criteria a - an ability to apply knowledge of mathematics, science, and engineering
 e - an ability to identify, formulate, and solve engineering problems
 k - an ability to use the techniques, skills, and tools necessary for engineering practice
EE Program Criteria: EE2 - knowledge of mathematics and sciences necessary to analyze and design complex systems

Required Textbooks and Software

- Title: [Principles of Wireless Access and Localization](#)*
- Author: K. Pahlavan and P. Krishnamurthy
- Publication date, edition, and publisher: 2013, Wiley & Sons
- ISBN number: ISBN-13: 978-0470697085 ISBN-10: 0470697083

* There is an electronic version of the required textbook available from the UF Library, <http://uflib.ufl.edu>. You will be able to access the e-book through Course Reserves in the course Canvas website. There is also an older version of the textbook from 2001: Principles of Wireless Networks: A Unified Approach, K. Pahlavan and P. Krishnamurthy, Prentice Hall, December 2001. ISBN-13: 978-0130930033, ISBN-10: 0130930032. The older version has the same foundational concepts, but not the updated standards information.

Recommended Materials*

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

- Title: Mobile Communications
- Author: J. Schiller
- Publication date, edition, and publisher: 2003, 2nd edition, Addison Wesley
- ISBN number: *ISBN 0-321-12381-6*

- Title: Wireless Communications and Networks
- Author: W. Stallings
- Publication date, edition, and publisher: 2002, Prentice Hall
- ISBN number: *ISBN 0-13-040864-6*

Course Schedule

Week 1:	Introduction and Overview/Layered Networks; Chapter 1
Week 2:	Signal Propagation, Chapter 2
Week 3:	Signal Propagation (continued), Chapter 3, Sect 3.1, 3.2
Week 4:	Cellular System Evolution and Modulation Techniques (Chapter 3, Sect 3.4)
Week 5:	Cellular System Evolution and Multiplexing Techniques (Chapter 3, Sect 3.5)
Week 6:	Project 1 Presentations
Week 7:	Cellular System Design and Network Planning (Chapter 5)
Week 8:	Review / Exam 1
Week 9:	<i>Spring Break</i>
Week 10:	Next Generation WiFi Systems
Week 11:	Wi-Fi to WPAN Physical Layer Alternatives (Chapter 3, Chapter 11)
Week 12:	WiFi to WPAN Medium and Multiple Access Protocols (Chapter 4, Chapter 11)
Week 13:	IEEE 802.11 Standards
Week 14:	Review / Exam 2
Week 15:	WiFi to WPAN Ad Hoc Networks (Chapter 13)
Week 16:	Project 2 Presentations and Demonstrations

Attendance Policy, Class Expectations, and Make-Up Policy

- 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 may be required for homework and assignments. Access will be free to students (either by UF agreement with company or by use of open source simulators.)
- Regular Participation is Expected:
 - Perfect class attendance is not required, but regular participation is expected. It will be tracked through participation in the in-class problems.
 - It is the student's responsibility to independently obtain missed material from lectures. Check e-learning.
 - Excused absences are consistent with university policies in the undergraduate catalog and require appropriate documentation. <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 or as pre-approved by the instructor), for which the student has provided verifiable documentation.
- Individual Effort
 - All assignments are assumed to be an individual effort unless otherwise specified by the instructor.

- Announcements and updates will be made in Lecture or via the E-learning system.
 - E-learning sends announcements to your gatorlink email. You will need to check it regularly.
- Class participation
 - A class participation grade will be assigned to each student to reflect performance on in-class assignments, as well as discussion participation, disruptive behavior, tardiness, etc.

Evaluation of Grades:

Assignment	Percentage of Final Grade
Homework Sets (5)	15%
Midterm Exam 1	25%
Midterm Exam 2	25%
Cumulative Final Exam (optional)	Replaces lowest exam grade
Projects (2 to 3)	30%
Class Participation Grade	5%
TOTAL	100%

Grading Policy:

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

Percent	Grade	Grade Points
93 - 100	A	4.00
90 - 92	A-	3.67
87 - 89	B+	3.33
83 - 86	B	3.00
80 - 82	B-	2.67
77 - 79	C+	2.33
73 - 76	C	2.00
70 - 72	C-	1.67
67 - 69	D+	1.33
63 - 66	D	1.00
60 - 62	D-	0.67
0 - 59	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/sccr/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 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.
<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.

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