

## **EEL 6591 – WIRELESS NETWORKS**

**Catalog Description** – (3 credits) Design and analysis of wireless networks including channel characteristics, physical layer, cellular concepts, multiple access control protocols, FEC and ARQ protocols, resource allocation, and wireless standards.

**Pre-requisites and Co-requisites** EEL 5718 and basic knowledge of probability and statistics.

**Course Objectives** By the end of this course, students will know the basic operation and design of a wireless system, specifically, the key features of the 5th Generation (5G) mobile networks. Students will learn how wireless networks are designed, how to do wireless network simulations, and how to critically evaluate recent research papers.

**Instructor** – Dr. Janise McNair

- a. Office Location: NEB 429
- b. Telephone: 392-2629
- c. E-mail address -- Use Canvas Mail tool
- d. Web site – [wam.ece.ufl.edu/winets](http://wam.ece.ufl.edu/winets)
- e. Office hours – one hour, starting 30 minutes after lecture

**Teaching Assistant** – Keerthiraj Nagaraj

- a. Office location: NEB 456
- b. Telephone
- c. E-mail address -- Use Canvas Mail tool
- d. Office hours -- See Canvas website for class

**Meeting Times** – M,W,F Period 6

**Class/laboratory schedule:** 3 sessions per week, 50-minute sessions

**Meeting Location:** NEB202

**Material and Supply Fees** -- none

**Textbooks and Software Required**

- a. Title – Fundamentals of 5G Mobile Networks
- b. Edited by Jonathan Rodriguez
- c. Publication date and edition – June 2015
- d. ISBN numbers:  
ISBN-13: 978-1118867525  
ISBN-10: 1118867521

**Recommended Reading (Optional):**

**For calculation explanations and example problems:**

- i. Principles of Wireless Access and Localization by K. Pahlavan and P.

Krishnamurthy, Wiley, November 2013

ISBN-13: 978-0470697085

ISBN-10: 0470697083

*Note: The Wireless Access and Localization textbook has an older version called, Principles of Wireless Networks: A Unified Approach. The 2001 version is out of print, but can still be purchased on Amazon (and possibly at the UF bookstore).*

Principles of Wireless Networks by K. Pahlavan and P. Krishnamurthy, Prentice Hall, December 2001.

ISBN-13: 978-0130930033

ISBN-10: 0130930032

**For background on computer communications**

- ii. W. Stallings, Wireless Communications and Networks, Prentice-Hall, 2002

ISBN 0-13-040864-6

- iii. Alberto Leon-Garcia, Communication Networks, McGraw-Hill, 2nd ed., 2003.

ISBN-10 007246352X

ISBN-13”9780072463521

**Course Outline** (provide topics covered by week or by class period)

Week 1:	Course	Overview,	Drivers	for	5G
Week 2:	5G				Internet
Week 3:	5G		Internet		(continued)
Week 4:	Cellular	Networks	and	5G	Small Cells
Week 4:	Project		Proposal		Presentations
Week 5:	Cellular	Networks	and	5G	Small Cells (continued)
Week 6:	Project		Proposal		Presentations
Week 7:	Cooperative				Protocols
Week 8:	Review	/		Midterm	Exam
Week 9:	Spring				Break
Week 10:	Mobile				Clouds
Week 11:	Cognitive				Radio
Week 12:	Project	Progress	Presentations	or	Discussions
Week 13:	Mobile		Social		Networks
Week 14:	Security		in		5G
Week 15:	Small		Satellite		Networks
Week 16:	Project	Presentations	and	Demonstrations	

**Course**

**Website:**

Access Canvas via <http://elearning.ufl.edu> . The class website will be used to:

- view announcements, course schedule and other required information, collaborate with project groups, start discussions, view e-book in course reserves, download class lecture notes, handouts and assignments, and submit presentations and project files (Office, Text, or PDF only).

**Computer****requirements:**

--Access to a networked computer is needed for the simulation project and some homework problems (e.g., MatLab, C/C++, ns-2)  
--If you need remote access to the ECE computer lab, you must create an account. Contact instructor for more information.

**Attendance and Expectations**

Class attendance is required. A class participation grade will be assessed, based on class participation during group presentations.

**Grading** – Homework (10%), Midterm exam (25%), Review Report (25%), Course Project (40%), In-Class Participation (5%)

**Grading Scale** –For information on UF grades and grading policies, please visit: <http://gradschool.ufl.edu/catalog/current-catalog/catalog-general-regulations.html#grades>

Note: In order to graduate, undergraduate students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). A C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement.

**Make-up Exam Policy**

There will be no make-up exams, except for rare, unavoidable cases (as determined by the instructor), for which the student has provided verifiable documentation at least 2 weeks in advance.

**Honesty Policy** – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

**Accommodation for Students with Disabilities** – Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

**UF Counseling Services** – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
- SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, Sexual assault counseling.
- Career Resource Center, Reitz Union, 392-1601, Career development assistance and counseling.

**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.

**Online 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>. Evaluations are typically open during the last two or three weeks of the semesters, 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>.