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
   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-10: 1118867521
Recommended Reading (Optional):

For calculation explanations and example problems:

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).

ISBN-10: 0130930032

For background on computer communications

ii. W. Stallings, Wireless Communications and Networks, Prentice-Hall, 2002
ISBN 0-13-040864-6

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 Networks
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.