ECE 421 and ECE 546 Fall 2021 Instruction Plan

(Regular Online Instruction with Asynchronous Remote Section)

Course Number: 14:332:421 / 16:332:546

Course Name: Wireless Communication System / Wireless Communications Technologies

Course Type: Cross-listed UG/Grad (will be held concurrently)

Instructor Name: Prof. Dario Pompili, PhD

Assigned Course Meeting Times: Mondays 7–10pm EST

Instruction Format: Recognizing that the university will operate in a mode where regular instruction will be complemented by a separate remote instruction section for students unable to attend the regular instruction sections, the instructor for this class has developed a plan for providing regular online instruction and asynchronous remote instruction to class participants.

Asynchronous instruction will involve recorded lectures that will be posted on the course Sakai website. Lectures will be recorded using Powerpoint Show or Google Slideshow, which provides an audio accompaniment for the slides.

All lectures will be available for remote students to watch asynchronously, at their convenience, recognizing that many students will be in different time zones.

At regular intervals, students in both modes of instruction will be polled for acquiring feedback necessary for keeping both modes of instruction on pace with each other. Further, the feedback will be used to ensure that the ABET educational goals and objectives of the class are being met.

Textbook: Fundamentals of Wireless Communication, David Tse and Pramod Viswanath, Cambridge University Press, 2005 (freely downloadable at: https://web.stanford.edu/~dntse/wireless_book.html). This textbook takes a unified view of the fundamentals of wireless communication and explains the web of concepts underpinning these advances at a level accessible to an audience with a basic background in probability and digital communication.

Course Description: This course is an introduction to the basic principles and applications of wireless communications. It covers the following topics: The wireless channel; Point-to-point communication: detection, diversity and channel uncertainty; Cellular systems: multiple access

and interference management; Capacity of wireless channels; Multiuser capacity and opportunistic communication; MIMO I: spatial multiplexing and channel modeling.

Course Grading: Recognizing the need to alter traditional course evaluation plan because some students will experience traditional lectures, while others will experience remote instruction, the instructor will adjust the evaluation format to provide a fair assessment across both modes of instruction. The specific grading breakdown the instructor will follow is:

Quizzes: 16%

Midterm exam (online synchronous): 20%

Final exam (cumulative, online synchronous): 25%

Course Project (semester-long project with 3 homework assignments, 13% each): 39%

Quizzes and exams will be given to remote students using online methods. All students will be required to acknowledge an Honor Pledge; in which they commit to ensuring the integrity of the grading process across both modes of instruction.

Office Hours: For students engaged in regular instruction, the instructor will make office hours available as per the usual practice. Since it will not be possible to hold office hours on campus for remote students, the instructor will interact with those students via email. Additionally, as necessary, the instructor will set up one-on-one office hour sessions using collaborative platforms, such as Zoom (at this link: https://rutgers.zoom.us/my/pompili) or WebEx (at this link: https://rutgers.webex.com/meet/pompili).