ECE-UY 4183 Wireless Communications: Senior Design Project 1
Fall 2020

Instructor: Prof. Michael Knox, mikeknox@nyu.edu
Office Hours: TBD

Teaching Assistant: TBD

Lectures, RH317	Tuesday	10:00am-11:50am
Lab A, LC016	Monday	11:00am-1:50pm
Lab B, LC016	Friday	11:00am-1:50pm

Course Pre-requisites: Comm Theory

ABET competencies: 1, 2, 3, 4, 5, 6, 7

Lectures are Mandatory. Labs are Mandatory. No personal electronics during lectures and labs unless approved by instructor or TA. On-time arrival is a must.

GRADING FOR EE4183 DP1

30% Lab Reports
30% Final Exam (based on lab theory and experiments)
40% Project Effort and Presentations

LAB GOALS AND REQUIREMENTS

To develop an understanding of the theory and techniques used in modern wireless communications. The students will become familiar with test equipment used by wireless engineers including the RF spectrum analyzer and RF vector signal generator.

Lab experiments
- Lab lecture followed by lab experiment
- Lab Manuals and Lecture Material posted to NYU CLASSES. There are PCs in the lab to view the lab manual or use your own personal laptop. Otherwise bring a hard copy of the lab manual to your assigned lab section.
- **Final Exam** is online and covers the material from all lab lectures and laboratory experiments

Lab Topics

Lab 1: Equipment Orientation and PN Codes
Lab 2: Mixers, Modulation and Receivers
Lab 3: Bit Error Rates
Lab 4: Spread Spectrum Techniques
Lab 5: UHF Propagation
Lab 6: OFDM and Software Radio
Lab 7: RFID
Lab 8: Sensors and Zigbee

Textbook: None required.

Reference Material:

- Principles of Communication Systems, 2nd edition by Herbert Taub and Donald L. Schilling
- Digital Communications: Fundamentals and Applications, 2nd Edition by Bernard Sklar
- Digital Communications by John G. Proakis
- Modern Digital and Analog Communication Systems by B.P. Lathi

DESIGN PROJECT GOALS AND REQUIREMENTS

During the second half of the semester, teams will be formed to begin the research portion of the senior design project. Team size can range from 1-3 students with the preferred size of two students. The project begins with a proposed project topic and literature review of similar technologies.   Weekly presentations allow the team members to present their findings and discuss next steps. Software simulations are often included as part of the project development. A final report and final presentation are delivered by each team.

Appendix A includes notes about the requirements for spring 2021 semester of EE4283 SDP2.

APPENDIX A: Notes about spring semester EE4283 Senior Design Project 2 Requirements

Based on the research you gathered in SDP1, you will use *agile development* to rapidly iterate your product or concept to build/design a working prototype that customers could actually buy and use. Your working prototype will be submitted to the NYU Tandon Capstone Contest in the spring 2021 (typically last week of the semester).

Project Development

- Student presentations, every week.
- Design and develop an operational prototype.
- Submit project to the NYU Tandon Capstone Contest in the spring 2021.
- Your project can be *optionally* entered into the Innovention Contest, extra credit for each round achieved.
- Submission of project to the Tandon Research Expo for extra credit.

APPENDIX B: Intellectual Property and Contest Awards

- Every member of the team shares equally any intellectual property developed which working on the senior design project (as long as the project is not part of a government funded project at NYU)

- You and your team members need to disclose to each other what IP/Licensing rights any company you've worked at has to inventions you make at school

- If any member or members decide to start a company based on your class project, you own only what was written and completed in the class. You have no claim for work done before or after the SDP1/SDP2 course

- If a subset of the team decides to start a company they do NOT "owe" anything to any other team members for work done in and during the class. All team members are free to start the same company, without permission of the others. (We would hope that a modicum of common sense and fairness would apply.)

- If your team wins a competition or contest based on your design project and the award comes in the time you are enrolled in this senior design course, then the award will be divided equally among all the team members.

APPENDIX C: NYU School of Engineering Policies and Procedures on Academic Misconduct

Introduction: The School of Engineering encourages academic excellence in an environment that promotes honesty, integrity, and fairness, and students at the School of Engineering are expected to exhibit those qualities in their academic work. It is through the process of submitting their own work and receiving honest feedback on that work that students may progress academically. Any act of academic dishonesty is seen as an attack upon the School and will not be tolerated. Furthermore, those who

A.   breach the School's rules on academic integrity will be sanctioned under this Policy. Students are responsible for familiarizing themselves with the School's Policy on Academic Misconduct.

B.   Definition: Academic dishonesty may include misrepresentation, deception, dishonesty, or any act of falsification committed by a student to influence a grade or other academic evaluation. Academic dishonesty also includes intentionally damaging the academic work of others or assisting other students in acts of dishonesty. Common examples of academically dishonest behavior include, but are not limited to, the following:

1.   Cheating: intentionally using or attempting to use unauthorized notes, books, electronic media, or electronic communications in an exam; talking with fellow students or looking at another person's work during an exam; submitting work prepared in advance for an in-class examination; having someone take an exam for you or taking an exam for someone else; violating other rules governing the administration of examinations.

2.   Fabrication: including but not limited to, falsifying experimental data and/or citations.

3.   Plagiarism: intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise; failure to attribute direct quotations, paraphrases, or borrowed facts or information.

4.   Unauthorized collaboration: working together on work that was meant to be done individually.

5.   Duplicating work: presenting for grading the same work for more than one project or in more than one class, unless express and prior permission has been received from the course instructor(s) or research adviser involved.

6.   Forgery: altering any academic document, including, but not limited to, academic records, admissions materials, or medical excuses.

APPENDIX D: Moses Center Statement of Disability

If you are student with a disability who is requesting accommodations, please contact New York University's Moses Center for Students with Disabilities (CSD) at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 2nd floor.