RF Devices and Circuits

Catalog Data: ELEC 5130/6130. RF Devices and Circuits. Pr., ELEC 3700. Introduction to RF semiconductor devices and circuits targeted for wireless applications.

Text Book:

Reference Books:
- Integrated Circuit Design for High-Speed Frequency Synthesis by J. Rogers, C. Plett, and F. Dai

Instructor: Foster Dai, 404 Broun Hall. Tel. 844-1863, Email: fosterdai@auburn.edu
Office Hour: 5:00 ~ 6:00 pm, TU, TH.

Objectives: This course provides information about fundamentals of radio frequency (RF) devices and circuits. It introduces both system and circuit level designs on wireless communication transceivers. The course is designed for senior and graduate students with prerequisite of ELEC 3700 Analog Electronics or with consent of the instructor. Grading for 6130 requires additional work on class assignments.

Topics: (75 minute classes, twice per week)
- Chapter 1 Introduction to RF and Wireless Technology
- Chapter 2 Basic Concepts in RF Design
- Chapter 3 Communication Concepts
- Chapter 4 Transceiver Architectures
- Midterm I
- Chapter 5 Low Noise Amplifiers
- Chapter 6 Mixers
- Chapter 7 Passive Devices
- Midterm II
- Chapter 8 Oscillators
- Chapter 9 Phase-Locked Loops
- Chapter 10 Conclusions
- Final Review
- Final Exam
Grading: Different requirements applied to 5130 and 6130.

- Homework (10%)
- Midterm Exam I (26%)
- Midterm Exam II (26%)
- Final Exam (38%)

Class Calendar:

| Aug. 18  | Classes Begin | (Tues) |
| Sept. 29 | Midterm I     | (Tues) |
| Oct. 15  | Fall Break (no class) | (Thurs) |
| Oct. 29  | Midterm II    | (Thurs) |
| Nov. 23-27 | Thanksgiving Break (no class) | (Mon - Fri) |
| Dec. 4   | Classes End   | (Fri)  |
| Dec. 11 (12:00~2:30 p.m.) | Final Exam | (Fri) |

Primary program outcomes related to this course:
Outcome 1. Ability to apply knowledge of math, science and engineering to solve problems.
Outcome 2. Ability to apply in-depth knowledge in one or more disciplines.
Outcome 3. Ability to design an electrical component or system to meet desired needs.
Outcome 6. Proficiency in the use of computers and other modern tools to solve engineering problems.
Outcome 8. Proficiency in communicating ideas and information orally and in writing.
Outcome 9. Appreciation of the need for, and an ability to learn new concepts as required for the continuing practice of ECE.

Computer usage: Matlab or similar.

Attendance Policy: Course attendance is strongly encouraged, but will not be a factor in determining the course grade.

Justification for Graduate Credit: Students enrolled in ELEC 6130 will be asked to do additional questions in the exams.

Academic Honesty Policy: All portions of the Auburn University student academic honesty code (Title XII) found in the Tiger Cub will apply to this class. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

- Course info located at ftp://ftp.eng.auburn.edu/pub/daifa01/ELEC5130_6130/.

Prepared by: Fa Foster Dai, Date: August 8, 2015.