Course Outline

Instructor
- Prof. Greg Bridges, P.Eng.
  E3-465 EITC
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  Greg.Bridges@umanitoba.ca
  (Reference to ECE 4860 must appear in the subject line.)

Office Hours
- Tuesday, 11:30am–12:30pm
  or by appointment

Teaching Assistant
- TBD

Contact Hours
- 4 credit hours
- Lectures
  3 hours × 13 weeks = 39 hours
- Laboratories
  3 hours × 5 weeks = 15 hours

Prerequisites:
- ECE 3590 Electromagnetic Theory

Course Website:
http://ece.eng.umanitoba.ca/undergraduate/ECE4860/RF/ECE4860/Home.html

Course Outline

ECE 4860 (T01) – Design of RF Devices & Wireless Systems  Winter 2015

Course Objectives

Learn techniques for the design, simulation, fabrication and testing of RF and microwave circuits at the device and systems levels. Gain experience with CAD tools for design of RF components and RF systems. The course will involve design, implementation and test of example RF devices and systems. Basics of RFID technology will be covered.

Course Content

The following topics will be covered:

- Introduction to wireless system architectures.
- Brief review of transmission line and microwave network theory.
- Noise and distortion in microwave systems.
- Antennas and propagation for wireless systems.
- Microwave system components: passive circuits, filters, amplifiers, mixers, oscillators.
- RF Integrated Circuits.
- RFID.

Laboratories

The course will consist of 5 laboratories involving design, simulation, fabrication, and testing of RF circuits and systems.

Textbook (Suggested)


Other References


(ISBN:0-471-32282-2) (short version of the above textbook)

Requirements/Regulations

- Attendance at lectures and laboratories is essential for successful completion of this course. Students must satisfy each evaluation component in the course to receive a final grade.
- It is the responsibility of each student to contact the instructor in a timely manner if he or she is uncertain about his or her standing in the course and about his or her potential for receiving a failing grade. Students should also familiarize themselves with the University’s General Academic Regulations, as well as Section 3 of the Faculty of Engineering Academic Regulations dealing with incomplete term work, deferred examinations, attendance and withdrawal.
- No programmable devices or systems (such as calculators, PDAs, iPods, iPads, cell phones, wireless communication or data storage devices) are allowed in examinations unless approved by the course instructor.
Learning Outcomes

1. Understand the architecture and parameters used to evaluate the performance of a transceiver.
2. Be able to design basic RF system components such as filter, amplifier, mixer, oscillator.
3. Measure and evaluate the performance parameters of RF device and system level components.
4. Be able to use appropriate CAD tools for wireless system analysis and RF device design.
5. Be able to design and construct a wireless system such as an RFID.

Expected Competency Levels

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Evaluation

The final course grade is determined by the student's performance on assignments, quizzes, in laboratories, term test, and on the examination. Students must complete all the laboratories in order to be eligible to receive a passing grade.

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<th>Component</th>
<th>Value (%)</th>
<th>Method of Feedback</th>
<th>Learning Outcomes Evaluated</th>
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<tr>
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* Method of Feedback: F - Formative (written comments and/or oral discussion), S - summative (numerical grade)

Academic Integrity

Students are expected to conduct themselves in accordance with the highest ethical standards of the Profession of Engineering and evince academic integrity in all their pursuits and activities at the university. As such, in accordance with the General Academic Regulations on Academic Integrity, students are reminded that plagiarism or any other form of cheating in examinations, term tests, assignments, projects, or laboratory reports is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university). A student found guilty of contributing to cheating by another student is also subject to serious academic penalty.