EE-271 – Fall 2012 Semester Class Project

Project Description

Students will individually research a “practical topic” or “applied example” of Engineering Electromagnetics. *Two lecture classes will be designated as project time so students can work on the project.* This project is worth 10% of your overall grade as stated in the course “Class and Grading Policy”.

Requirements:

- One-page minimum, two-page maximum report on the topic.
- Format is to follow the IEEE conference proceedings template: [http://www.ieee.org/conferences_events/conferences/publishing/templates.html](http://www.ieee.org/conferences_events/conferences/publishing/templates.html)
- (see Microsoft Word, US letter)
- References: minimum three references. At least one reference must be a technical book or a journal paper (IEEE, etc.)
- Your reference list must be included in the report, but does not count towards the page number requirements (i.e., 3 inches of reference text at the bottom of a one-page document does not constitute a full 1-page document).
- Descriptive figures are permitted, they must be reasonably sized (not a space-filler) and properly referenced.

Dates and deadlines:

- Lecture hours designated for this project will be designated later.
- Final report will be due by 4:30 pm on Wednesday, December 05, 2012 (one week before the finals).
- Hardcopy for the final report in my mailbox is preferred, but may be also submitted via e-mail.

Possible topics:

- *Time-domain reflectometry*
- *Grounding and shielding*
- *Lightning*
- *Electrostatic discharge*
- *Problems of electromagnetic compatibility*
- *Signal integrity*
- *Power integrity*
- *Inductance calculations*
- *Radio broadcasting*
• Ground penetration radars
• Capacitor design problems
• Stripline and/or microstrip circuit design
• Numerical methods of electromagnetic
• Transformers
• Wireless communication
• Lasers
• Doppler effect and radars
• Galvanometer
• Faraday Cage
• Faraday Disk generator
• Antenna Design (any type!)
• Electric power transmission
• Electric power generation
• Magnetic materials
• Dielectric materials
• RFID
• Microwave oven
• Leyden Jar
• Electric motors
• Microwave ferrites
• Ferroelectrics
• Hall effect
• Electrolytes
• Radio astronomy
• Night vision
• Remote sensing and radars
• Thermoelectric effects
• Electromagnetic wave pressure
• Communication in sea water
• Vector network analyzer
• Any of the “Electromagnetic Greats” (Coloumb, Gauss, Ampere, Franklin, Faraday, Tesla, Oersted, Ohm, Maxwell, to name a few)
• Any idea – come up with your own!