EE 692 Advanced Electromagnetics  
Spring 2009, 3-0 (3 credit hours)  

Instructor: Dr. Dimitris E. Anagnostou, Office: PE-319 (Electrical Engineering/Physics Building), danagn@sdsmt.edu, http://anagnostou.sdsmt.edu

Lecture Room: 12:30 – 13:45 (MW), Room: EE-251-A.

Office Hours: 14:00-16:00 (MW) or by appointment

Students are encouraged to keep the textbook.


EE 692 Course Description: Lecture course or seminar on a topic or field of special interest, as determined by the instructor.

Prerequisite(s): EE382

WWW: Email and the page http://anagnostou.sdsmt.edu will be used for course-related communication. Ensure your @mines.sdsmt.edu email is listed on WebAdvisor.

ADA: Students with special needs or requiring special accommodations, contact the instructor and/or the campus ADA coordinator, Jolie McCoy, at 394-1924.

Grading: Homework ................................................................. 40%
Projects / Assignments ............................................................. 20%
Midterm Exam (closed book, 1 handwritten sheet allowed) .................. 10%
Final Exam (required, open book and notes) ................................... 30%
Total...... 100%

Tentative Grading Scale: The minimum percentage necessary for each letter grade is as follows: 100 > A > 90, 89 > B > 80, 79 > C > 70, 69 > D > 60, F < 60. The instructor reserves the right to adjust this scale at the end of the semester (to the students’ advantage), based on the student's overall course percentage and on the difficulty of course assignments and examinations.

Projects: Assignments will be announced as they come up during the semester.

Reading Assignment: Students individually or in groups will be required to read a paper from a related scientific journal or chose an antenna-related topic and write a report and/or present it in class. Topics and papers will be distributed in class. Students can work on a topic of their own interest after getting approval from the instructor. The report must be in IEEE format, which can be obtained from: http://www.ieee.org/web/publications/authors/transjnl/index.html, or from: http://www.ieee.org/portal/cms_docs/pubs/transactions/TRANS-JOUR_DOC.
Tentative Course Schedule
Antennas for Wireless Communications, EE 692, Spring 2009

The following chapters will be fully or partially covered:

Chapter 1. Time-Varying and Time-Harmonic E/M Fields
Chapter 2. Electrical Properties of Matter
Chapter 3. Wave Equation and its Solutions
Chapter 4. Wave Propagation and Polarization
Chapter 5. Reflection and Transmission
Chapter 6. Auxiliary Vector Potentials, Solutions, Radiation and Scattering
Chapter 7. Electromagnetic Theorems and Principles
Chapter 8. Rectangular Cross-Section Waveguides and Cavities
Chapter 9. Circular Cross-Section Waveguides and Cavities
Chapter 11. Scattering
Chapter 14. Green’s Functions

May 6th 2009 EE692 Final Exam, 9-10:50am, Room: To be arranged

For material that is not in contained in the textbook, handouts will be distributed.

Homework, exam and attendance policies:

- Homework is due before class begins. Late homework will not be accepted. For full credit, show all your work (include code for plots, units, intermediate stages, etc.). Include the equations you used. If you use equations derived elsewhere, reference them (e.g., source, eq. number and/or page). Box or double underline your answers. Use conventional engineering units (i.e. μF, mV, GHz, etc). All pages should be in order, numbered, and stapled (NO paper clips / folded corners).
- Exam dates are fixed. There will be absolutely no changes to these dates.
- Attendance is not required but students are responsible for all the material we cover.
- Do not contact the instructor if you miss a lecture. If you miss an exam for good and valid reason, inform the instructor as soon as possible to schedule a make-up exam.
- All laboratory/project assignments must be completed at a passing level to pass.
- Unless otherwise specified, all coursework is to be individually completed. See The Student Code of Conduct for SDSM&T.

Electronic Devices Policy: Students must turn off their cell phone, ipod and any other electronic device before class starts. No text messaging in class. No headphones. If you wish to use a laptop for note taking, you may; however, you are required to download DyKnow and join EE692 to activate. Any attempt to circumvent the DyKnow monitoring system will be considered a form of cheating and a breach of academic integrity. According to “Policy Governing Academic Integrity” in the SDSM&T Undergrad Catalog, the instructor has discretion of how acts of academic dishonesty are penalized, subject to the appeal process, and that “Penalties may range from requiring the students to repeat the work in question to failure in the course” (72-73). No other use of any other electronic/computer media is allowed.
**Integrity Policy:** You are expected to do your own work (as an individual or as a team as the case may be); however, one can learn by consulting with others. If you receive help from others, acknowledge that assistance appropriately. Understand the significant difference between consulting or asking someone a question versus outright copying or plagiarism. If individuals or teams turn in assignments that are clearly not their own work, all parties involved can expect to receive no credit for that assignment. In addition, if teams fail to demonstrate teamwork, all parties involved can expect to receive no credit for that assignment.

**Freedom In Learning:** Students are responsible for learning the content of any course of study in which they are enrolled. Under Board of Regents and University policy, student academic performance shall be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Students who believe that an academic evaluation reflects prejudiced or capricious consideration of student opinions or conduct unrelated to academic standards should contact the dean of the college which offers the class to initiate a review of the evaluation.

**Course objectives:**

1. Introduce students to the fundamentals of Maxwell’s equations and their relation to wave propagation in material media, reflection and transmission.

2. Understand wave principles of waveguides and the modal description of the fields.

3. Understand the vector potentials and field theorems, specifically with regard to antennas, radiation and scattering.

4. Math and computation: Develop mathematical skills including vector calculus and linear algebra, and implement solutions to electromagnetic problems.

**Related Courses:**

- EE 692 – Advanced Antenna Engineering
- EE 692 – Computational Electromagnetics
- EE 692 – Advanced Microwave Engineering
- PHYS 521 – Electromagnetism
- MES 692 – Printed Electronics