

EE 447/647 ANTENNA THEORY

<u>Winter, 2004</u>	Instructor, Dr. R. Riechers	Phone: 429-3468 (Home) e-mail: riechersrg@worldnet.att.net
<u>Office Hours:</u>	Room: 112C Russ Center	Time: TBD
<u>Lecture:</u>	Room: TBD	MW 6:10-7:40 PM
<u>Lab:</u>	Room 112C/112D Russ Center	Day/Time: TBD

Topics To Be Covered By Week

Week 1:	Review of EM needed to study antennas, Chapter 1 (Balanis)
Week 2:	Chapter 2 (Balanis)
Week 3:	Chapter 3 (Balanis)
Week 4:	Chapter 4, Chapter 5 (Balanis)
Week 5:	Chapter 6, (Balanis) First Exam, Take-home, Begin antenna fabrication project
Week 6:	Chapter 7 (Balanis)
Week 7:	Chapter 11 (Balanis)
Week 8:	Chapter 14 (Balanis)
Week 9:	Chapter 16 (Balanis)
Week 10:	Final, Project Report / Demonstration

Final Examination: Last Week of the Term, Day/Time: TBD

TEXTS

Antenna Theory, Analysis and Design, Constantine Balanis,
Antennas for All Applications, John Kraus and Ron Marhefka (Reference)

These books are bargains at twice the price, especially Kraus' book. The texts and the authors are some of the best in the business, and they will be valuable references for your library.

GRADING (Subject to Change)

Your Grade will be based upon total of 400 points distributed as follows:

1. 100 points for the first exam
2. 125 points for Computer Project
3. 125 points for Antenna Fabrication Project
4. 50 points for homework problems

There will be a number of exercises assigned during lectures, each worth five (5) points. These exercises will be in addition to the regular HW problems. Thus an additional fifty (50) points will be available. These are **optional**, for those needing an additional number of points to boost their grade. I repeat, **THIS IS OPTIONAL.**

There will be a laboratory for this course, as part of the lab you will be required to use the software: **Microwave Office**. This is a Microwave Circuit Design software package used in the industry. This will be used on a weekly basis during the lab, it can be run on any of the networked PC's in Rm 112C.

We will design several RF components, and realize these designs in microstrip. These Lab projects will contribute 125 points to your final grade. A more significant design project will be given later in the term, and will contribute 125 points to your final grade.

The Lab will also involve the design and realization of RF structures in microstrip, this will require that we use the Printed Circuit Facility in Room 112D in the Russ Center. This Lab will involve the use of chemicals so I recommend that you locate the safety goggles you used in Chemistry, the apron or lab coat and some old shoes. When you are etching you will need gloves that the EE department will provide. You will be expected to wear your goggles in the etching room and it is strongly advised that you wear an apron or lab coat to protect your clothing. The active ingredient is sodium perchlorate, which acts as a bleach and will spot your clothes. So if you want to be safe use an apron or lab coat.

REFERENCES

1. *Antenna Theory and Design*, Gary Thiele and Warren Stutzman
2. *Principles of Antenna Theory*, Kai Fong Lee
3. *Antenna Analysis*, Edward, Wolff
4. *Antenna Engineering*, W. I. Weeks
5. *Antennas, Theory and Practice*, Sergei Schelkunoff and Harald Friis

These books and the literature (*IEEE Transactions on Antennas and Propagation*) contain a great deal of supplemental material to fill any gaps left by the text or my lectures. In addition, there is a collection of trade journals in 112 Lobby area. These offer a very practical source of design information and will help you become with the vendors and their products in the antenna field. Use them!