Fields and Waves I

ECSE-2100   **Spring 2000**

Preparation Assignment for Project 2
Due at the start of class.

Reading Assignment
See the handouts for each lesson for the reading assignment.

27 March Lesson 4.4
Write out in phasor form the voltage and current on the 75 ohm transmission line you
analyzed in Homework 6 for each of the three loads: 75 ohms, open circuit and 300 ohms.
Be specific – use real numbers for all of the parameters.

29 March Lessons 4.5 and 4.6
a. Write out the voltage and current on the 50 ohm transmission line (in phasor form) with
a 93 ohm load analyzed in question b5 of problem 1 in lesson 4.4.
b. For a lossless line with a purely resistive load, when will $Z_{in} = Z_L$? That is, when will
the input impedance equal the load impedance?
c. Write out the general expression for the characteristic impedance of a general lossy line.
Under what conditions does this expression reduce to that of a lossless line?

d. What is the VSWR when a transmission line is properly matched?

31 March Lesson 4.2
a. What parameters are essentially the same for low-loss lines?   What is new?
b. Write out the voltage and current on the 50 ohm line with a 93 ohm load (in phasor
form) using the low-loss line parameters developed in problem 1 of lesson 4.5.
c. What is a lattice diagram? (This also goes by other names such as reflection diagram,
bounce diagram, etc.)
d. Try out the Java applet listed with today's lesson. Consider the case where the source
resistance is 50 ohms, the cable impedance is 50 ohms and the load is 25 ohms. Also, try
the applet at http://users.ece.gatech.edu/%7Ewrscott/applet_bounce/Reflect1.html
by setting up the same kind of problem. Print out a plot produced by one of the applets
showing the voltage at some location on the line. Identify the location.

3, 7 April (5 April is a holiday)
Open Shop for Project 2