

- Session:** Class: Tuesday, Thursday 6 pm
Lab: Tuesday or Thursday at 7:30 pm
- Text:** William Sinnema, Electronic Transmission Technology: Lines, Waves, and Antennas, 2nd Edition, Upper Saddle River, NJ, Prentice-Hall, 1988
- Prerequisite:** ECET 2110
- Instructor:** Walter Thain
Office: G162 (678) 915-7436
ECET Department Phone: (678) 915-7246
Home Phone (before 9 PM): (770) 579-3051
Office Hours: posted at my office, or by appointment
e-mail: use VISTA e-mail tool
web: See the 3410 VISTA page and my web site
<http://fac-web.spsu.edu/ecet/wthain/>
- Objectives:** This course is a survey of data communications topics. Upon successful completion of the course, the student will be able to
- Calculate voltages, currents, and impedance of RF transmission lines
 - Describe the behavior of DC transients on transmission lines
 - Use the Smith chart to solve for transmission line performance parameters
 - Implement stub matching networks on a transmission line using the Smith chart
 - Calculate parameters associated with plane wave propagation
 - Describe waveguide operation and calculate parameters associated with waveguide operation and selection
 - Calculate performance parameters of simple antennas
 - Describe fiber optic waveguide operation and calculate parameters associated with waveguide operation and selection
- Class Attendance:** On-time attendance is expected. You are responsible for everything covered and all assignments given during classes you miss. Obtain assignments, handouts, etc., for days you miss from classmates, from the Vista site, or ask me after class. Lab attendance is discussed in the Laboratory Policy section of the syllabus.
- Homework:** Homework will be assigned and not collected for grading. Homework is for your benefit; so do not fall behind. If you are having trouble, see me or consult with classmates.
- Quizzes:** There will be three tests over material covered in class and lab. If you miss a test with an approved absence, you must make it up as soon as possible after your return.
- Unapproved absences result in a zero for the test grade.* If you must miss a

quiz, obtain approval at least **48 hours** in advance of the test. Extenuating circumstances, e.g. a car accident, will be given consideration.

Expected Quiz Dates:

Quiz 1: Thursday, February 9

Quiz 2: Thursday, March 22

Quiz 3: Thursday, April 19

**Laboratory
Grades:**

Each student must perform **all** hands-on lab exercises to pass the laboratory portion of the course. **Department policy requires the student to pass the laboratory portion of the course (earn 60% or better) in order to pass the course.**

Lab exercises may or may not require a lab report or a lab quiz. Those that do not are called check-off labs.

Lab exercises requiring a report or a lab quiz count the same. Check-off labs count as 1/3 of a report/quiz lab.

The lab grade is computed as follows:

$$\text{Lab Grade} = \frac{\sum \text{Report/Quiz Grades} + 0.33 \times \sum \text{Check Lab Grades}}{(\text{Number of Report/Quiz Labs} \times 100) + (33 \times \text{Number of Check Labs})} \times 100\%$$

All lab reports are informal and use a memo format. **All work must be computer generated.** An exception is for hand written calculations and results included in an appendix.

Unless specified differently, lab reports are due on the next day your lab section meets within the first 10 minutes of the lab session. After that, the report is late 1 day. Each working day late costs 10 points off. A weekend counts as one day.

Lab reports must be turned in electronically. See the General section of this policy document for electronic document submission specifications. Failure to follow the electronic submission specifications can result in a points taken off for that lab exercise. Note that you can turn in paper copies of an appendix to keep electronic file sizes down. Do not turn in the laboratory exercise instructions as part of your lab report.

Read the lab exercise before arriving at the lab session. **Be sure to complete any required prelab assignment before coming to the lab session. It is part of your grade for that lab and it will be collected or checked at the beginning of the session.**

On-time attendance is expected. If you miss a hands-on lab with an approved absence, you can make it up at a mutually agreed upon time and you can earn full credit for the lab exercise.

If you miss a hands-on lab with an unapproved absence, including check-off labs, you must make up the lab; but your grade for the lab portion of the course reduces by 12 points. If the hands-on lab missed with unexcused

absence normally required a lab report, you do not have to turn one in because it will not be graded. Once you make up the lab exercise, the penalty is implemented by giving you full credit for the particular exercise and subtracting 12 points from the overall lab grade.

If you miss a Demo lab with an unapproved absence, you cannot make up the lab and your grade for the lab portion of the course is reduced by 12 points. The penalty is implemented by giving you full credit for the particular exercise and subtracting 12 points from the overall lab grade.

Failure to make up a missed hands-on lab exercise before the last day of class results in a 0 for the lab portion of the course grade; and therefore you fail the course.

If a required report for a hands-on lab is not turned in, you receive the minimum credit specified by the instructor for having performed that lab correctly.

Failure to take a lab quiz reduces that individual lab's grade by the number of points the quiz is worth.

Failure to turn in a homework-type lab exercise report (like Smith Chart Project #1) results in a 0 for that individual grade only.

Note that some lab sessions may be subdivided into two "mini" sessions of 1 hr 25 minutes each to facilitate student access to equipment. In this case half the students will be assigned to first mini session and the other half to the second

Final Exam: The final exam day and time will be given later the semester.

Course	Quiz Avg.	54%
Grading:	Final Exam	24%
	Lab	20%
	Syllabus Quiz	2%

A = 100-90, B = 89-80, C = 79-70, D = 69-60, F = below 60

General: See the **Course Info – Start Here** module on the VISTA page for logistical information, including a copy of the syllabus and details on using VISTA.

Electronic document submissions must be in ONE Microsoft Word format (.doc or .docx) file and submitted via the VISTA course e-mail (not SPSU e-mail) or the VISTA course Assignments tool.

Late work must be turned in to (a) me in person, or (b) the ECET secretary's office, or (c) the technician lab if after 5 pm. Your deliverable will be dated signed by the person receiving it. **You may also submit late lab reports via VISTA e-mail (not SPSU e-mail).**

Neatness on work turned in for grading is important. Work that is sloppy or contains spelling and grammatical errors will be penalized.

If you appeal a grade, I reserve the right to re-grade the entire test or assignment. **All appeals for re-evaluation of a grade must be made within 5 working**

days after the assignment was returned to the class. Appeals can be made by e-mail.

Students are responsible for following the Student Conduct Code given in the Undergraduate catalog, particularly those paragraphs dealing with academic dishonesty.

If you are caught cheating: For the first offense, the maximum penalty is that you will receive a zero for that assignment. For the second, the maximum penalty is that you will fail the course.

Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the counselor working with disabilities at the ATTIC as soon as possible to better ensure that such accommodations are implemented in a timely fashion.

Course Outline

Week	Date (Monday)	Topic	Reference	Problems
1	1/9	Introduction, standard transmission lines	1-2,3,4	1.1,2,3,5,6
2	1/16	Transmission line modeling, transients on transmission lines	2-1,2,3 3-2	2.1,2,3,4,5 3.1,2,3,4,5,26
3	1/23	Transients, TDR, steady-state transmission line behavior	2-4 3-1,2,3,4	2.6,7,8,9 3.10
4	1/30	Steady-state transmission line behavior	3-7,8,9,12,13	3.11,14,15,16, 18, 20,24,25
5	2/6	(Quiz 1 2/9) , Smith Chart	4-1	
6	2/13	Smith Chart	4-2,3	4.1,2,3,4,5,6,7, 8,9,10
7	2/20	Smith Chart		
8	2/27	Impedance matching	6-1,2,3	6.1,2,3,4,5,6
	3/5	SPRING BREAK		
9	3/12	Plane waves	7-1,2	
10	3/19	(Quiz 2 3/22) , Good conductors, rectangular waveguides,	7-3,5,6	7.1,3,4,6,7,8, 10,21
11	3/26	Phase & group velocity, circular waveguides	7-7,8,9, 10, 11,12	7.11,12,13, 14,16,17,21
12	4/2	Radio wave propagation, reflection, refraction	8-1,2,3,4	8.1,2,3,4,5
13	4/9	Fiber optic communications	9-1,2,3,4,5	9.1,2,3,4,5,6,7, 8,9,10,11, 21
14	4/16	(Quiz 3 4/19) , Fiber optic communications	9-6,7,8	9.12,13
15	4/23	Dipole antennas	10-1,2,3,4,5	10.2,3,4,14,15

Lab Exercise Schedule (Subject to Change)

Lab Dates	Topic	Turn In Prelab?	Report Type	Report Due Date
1/10 1/12	No Lab Scheduled			
1/17 1/19	No Lab Scheduled			
1/24 1/26	Power Measurements (hands-on)	Yes	Memo	Thurs. 2/2 at 7:40pm for both sections
1/31 2/2	Time Domain Reflectometry (hands-on)		None	
2/7 2/9	Slotted lines (hands-on)		Memo	Thurs. 2/16 at 7:40pm for both sections
2/14 2/16	Swept frequency measurements #1 (hands-on)		None	
2/21 2/23	Determining an Unknown Load (homework)		Quiz + turn in calculations	Quiz is 3/1 <i>during class</i>
2/28 3/1	Smith chart project #1 (homework)		Memo	Thurs. 3/15 at 7:40pm for both sections
3/6 3/8	Spring Break			
3/13 3/15	Single-stub tuners (hands-on)	Yes	None	
3/20 3/22	Swept frequency measurements #2 (hands-on)		Memo	Thurs. 3/29 at 7:40pm for both sections
3/27 3/29	Smith chart project #2 (homework)		Memo	Thurs. 4/5 at 7:40pm for both sections
4/3 4/5	Waveguides (hands-on)		None	
4/10 4/12	No Lab Scheduled			

ECET 3410 Memo

To: Dr. Walter Thain

From:

Partners:

Group Yes or No. Indicate whether you are submitting this report as a
Report? group (if permitted) or individual.

Subject: This is the title of the lab exercise

Date: Report date

Introduction:

The first section of your report should be a *brief* summary of what was done and why it was done. To do this, you should read the entire laboratory instruction sheet, including the procedure section. Do not repeat the step-by-step instructions; instead give an overview of the procedure.

Results:

This section documents the results of the exercise and validates the analysis and conclusion sections of your report. Make use of tables when appropriate to organize your presentation of results. Include the results of prelab exercises in this section. Use equation numbers, table numbers, and figure numbers. For example, Eq. 1, Table 1, and Fig. 1 are typical naming conventions when referencing these items in a report. Be sure to include a title for figures and tables. Note that equation numbers are justified on the right margin and are given numbers like (1), (2), etc. Look at how it is done in your text. Note that figure titles appear under the figure and table titles are above the table.

Questions:

This section is reserved for answering the questions included at the end of the laboratory instructions if present. **Copy the complete question from the lab instructions and follow it with the answer.**

Conclusions:

This section pulls together all the information in the report and advises the reader of the important results. Do not recite the procedure. **All lab reports must have a good conclusion.**

Appendix:

Put hand calculations and copies of original data here to support what is stated in your report body.

Note: Your report should be concise, well organized, and use proper grammar and spelling. Always use complete sentences. Paragraphs consist of at least 3 sentences. Use the same type font and size throughout the report. Write your report in the third person so that it reads like a newspaper story. That is, do not use I, we, us, etc. Use either Times, Arial, or Courier fonts. Use 10 pt or 12 pt size only and do not change from one to the other.