Course Syllabus

EE 3407 Lecture component
Fall, 2015
M,W,F 11:00 – 11:50 am
WH, Room 311

Instructor: Prof. Jonathan Bredow (Lecture)

Office: Room 522 Nedderman Hall

Office Hours: M,W,F 9:00-9:30am, otherwise by appointment.

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Instructor WWW site: www.uta.edu/ee

Course WWW site: https://elearn.uta.edu/

Required Textbook(s): Fundamentals of Applied Electromagnetics, Ulaby, Michielssen, Ravailoi (6^{th} ed)

Optional material: TBD

Reference Materials: See materials provided on Blackboard.

Course Description: Time varying electric and magnetic fields, displacement current, Maxwell's equations and transverse electromagnetic waves; plane waves in an unbounded medium, waves in media with planar interfaces, boundary conditions, reflection and transmission, plane waves in lossless and lossy media; electromagnetic waves in a bounded medium, guided waves, wave guides, propagation modes; transmission lines, circuit models of transmission lines, transmission line equations, reflection at discontinuities, terminations, transient response, steady state waves on transmission lines, open and short circuited lines, power flow, impedance matching and the Smith chart, antennas. Problems and experimental demonstrations will be covered during recitation and laboratory sessions.

Course Learning Goals/Objectives: Refer to Table 1 at the end of the syllabus

ABET Outcomes coverage in the course: Refer to Table 2 at the end of the syllabus

Attendance Policy:

Drop Policy:

As per University guidelines. See the Registrar's Bulletin or the University Calendar for drop dates.

Tentative Lecture/Topic Schedule (Course Content) and Specific Course Requirements w/Descriptions:

Grade Computation: TBA – week of Sept 1

Policies: Late homeworks, projects and not showing for exams is inexcuseable with-out approval of instructor prior to due date or exam date

Aug.	28	What is electromagnetics and why is it important?
"	31	The Electric Field
Sep.	3	The Magnetic Field
"	5	Static fields, time-varying fields and EM waves
"	7	Labor Day
"	10	EM wave propagation
"	12	Boundary conditions and reflection of waves
"	14	" " " "
"	17	Transmission lines
"	19	Standing waves/reflections on transmission lines
"	21	" " " "
"	24	Impedance matching on transmission lines
"	26	Review
"	28	Exam 1
"	30	Relating reflection coefficient to impedance mismatch
Oct.	2	" " " "
".	5	General mathematical aspects in determining fields
"	7	Problems containing sources
"	9	Problems ignoring sources
"	12	EM radiation
"	14	" "
"	16	Radiation characterization for antennas
"	19	Waveguides
"	21	" "
"	23	Review
"	26	Exam 2
"	28	Electrostatic fields
"	30	" " "
Nov.	2	" " "
"	4	Dielectric materials
"	6	Magnetostatic fields
"	9	" " "
"	11	" " "
"	13	Magnetic materials
"	16	Inductance (L) and capacitance (C)
"	18	" " " "
"	20	Parasitic L's and C's in practical components and circuits
"	23	" " " "
"	25	EMI and EMC (FCC and other types of certification)
"	27	Thanksgiving
"	30	Overall assessment of applying knowledge of EM to practical problems in design and development
Dec.	2	What other topics of study might build on fundamental knowledge of EM?
"	4	" " " "
"	7	Review
"	9	" "

Final Exam: Wednesday Dec 16 11:00 am - 1:30 pm

Lab Schedule TBA

Week beginning with Monday	Topic
xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx

xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx
xxx	xxx

If you require an accommodation based on disability, I would like to meet with you in the privacy of my office, during the first week of the semester, to make sure you are properly accommodated.

Student Evaluation of Teaching

Students will be asked to complete instructor/course evaluation forms at the end of the semester.

Americans with Disabilities Act:

The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112—The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act – (ADA), pursuant to section 504 of The Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide **"reasonable accommodation"** to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with **informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels.**

Academic Dishonesty

It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

"Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22).

ANY CHEATING WILL RESULT IN SEVERE PENALTIES.

Table 1: Statements of Course Objectives

Student is expected to demonstrate:	ABET Outcome mapping
Understanding of many ways in which electromagnetics describes/impacts behaviors and functionality of modern electronic circuits and systems.	c, e, j
Ability to effectively design using transmission lines in practical low and high frequency electrical and electronic systems.	a, c, e
Ability to design simple impedance matching circuits for high frequency circuits and systems.	c, k
Fundamental understanding of EM radiation from intentional and unintentional sources.	a, e
Understanding of EM behaviors of dielectric and magnetic materials.	a, e
Ability to use modern instruments for characterizing EM systems, including VNA, spectrum analyzer and simple optical sources and power meters.	k
Demonstrate quantitative understanding of simple electromechanical systems in terms of forces associated with electric charges and currents.	a, e
Ability to analyze fields produced by a system of charges and currents.	A,e

Table 2: Coverage of ABET outcomes

ABET Outcome	Primary course component	Weight
(a) an ability to apply knowledge of mathematics, science, and engineering	**Exams, Homeworks, Projects**	**High**
(b) an ability to design and construct experiments, as well as to analyze and interpret data	**Lab**	**Moderate**
(c) an ability to design system, component, or process to meet desired needs	**Exams, Homeworks, Projects, Labs**	**High**
(d) an ability to function on multidisciplinary teams	**Lab**	**Low**
(e) an ability to identify, formulate, and solve engineering problems;	**Exams, Homeworks, Projects, Labs**	**High**
(f) an understanding of professional and ethical responsibility	**Not addressed**	**Not addressed**
(g) an ability to communicate effectively	**Projects, Labs**	**Moderate for written communication**
(h) the broad education necessary to understand the impact of engineering solutions in a global and societal context	**Not addressed**	**Not addressed**
(i) a recognition of the need for, and an ability to engage in lifelong learning	**Projects**	**Low**
(j) a knowledge of contemporary issues	**Not addressed**	**Not addressed**
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	**Projects, Labs**	**High**
(l) an ability to apply probability and statistics, including applications appropriate to electrical engineering	**Exams, Homeworks**	**Low**