Introduction to Electromagnetic Theory
EE 345

I. **Course Number**: EE 345

II. **Course Title**: Introduction to Electromagnetic Theory

III. **Office Hours:** TR 10:30am – 12:30pm

IV. **Semester Credit Hours**: 3

V. **Course Description**: This is an introductory course in engineering electromagnetics. Emphasis is placed on time-varying topics, such as transmission lines, Maxwell's equations, and plane and guided waves. The basic concepts of electromagnetic fields, including field vectors, and potentials will be covered. Prerequisites: **(**Math 315) Differential Equations and (Phy 2426) Physics 2. It cannot be taken concurrently with Math 315 and Phy 2426.

VI. **Required Textbook:** Elements of Electromagnetics, 6th Edition, Matthew O. Sadiku, Oxford University Press, Jan 2014, ISBN: 978-0199321384.

VII. **Student Learning Outcomes:** Upon completion of the course, students will

- **(i)** Apply vector calculus operations.
- **(ii)** Develop a knowledge of vector fields and scalar fields.
- **(iii)** Describe the fundamental nature of static fields, including steady current, static electric and magnetic fields.
- **(iv)** Apply Maxwell's equations and their application to time-harmonic fields, boundary conditions, wave equations, and Poynting's power-balance theorem.
- **(v)** Describe the properties of plane waves in unbounded space, and understand such concepts as wavelength, phase velocity, and attenuation.
- **(vi)** Solve problems involving lossless transmission lines with time-harmonic excitation.

VIII. **Course Outline**: Topics covered in this course include transient and time-harmonic transmission lines, Smith charts, Maxwell's equations, force, energy and power, plane electromagnetic waves, guided waves.

IX. **Course Requirements:** Attendance of lectures and completion of assignments

X. **Methods of Evaluation**:

Homeworks	20 pts
Test I	25 pts
Test II	25 pts
Test III	30 pts

XI. **Grading Scale**: A (100-90), B (89-80), C (79-70), D (69-60), F (59-0)

XII. **Faculty Office Location and Contact Information**:

Office: 318-C,
Phone: (903) 223-3181
Email: Hasan.Ferdowsi@tamut.edu

XIII. Course Schedule (Tentative):

Topics:

Vector Analysis (Coordinate systems and Transformation. Line, surface and volume integrals)	Weeks 1-3 (Chap. 1 to 3)
Electrostatics	Weeks 4-6 (Chap. 4 & 5)
Test I	Week 7
Magnetostatics	Weeks 8-11 (Chap. 7 & 8)
Test II	Week 12
Maxwell's Equations and Electromagnetic Wave Propagation	Weeks 13-14 (Chap. 9 & 10)
Transmission Lines	Weeks 15 (Chap. 11)
Test III	Week 16

XIV. Student Participation:

a. Participation Policy: Students are expected to attend the lectures

XV. ABET Outcomes Coverage

(a) an ability to apply knowledge of mathematics, science, and engineering

(e) identify, formulate and solve engineering problems

Disclaimer: The above procedure is subject to change in the event of extenuating circumstances.

Required Regulations:

Class Attendance: Class attendance at Texas A&M-Texarkana University is compulsory. A student's grade may reduce to a lower grade letter if he/she misses more than two classes without permission. When students are absent for emergency reasons, the number of excused absences permitted should not exceed the number of credit hours awarded for the course except for the most extreme unavoidable emergencies (e.g., death of family members, jury duty, etc.).

Disability Accommodations: Students with disabilities may request reasonable accommodations through the A&M-Texarkana Disability Services Office by calling 903-223-3062.

Academic Integrity: Academic honesty is expected of students enrolled in this course. Cheating on examinations, unauthorized collaboration, falsification of research data, plagiarism, and undocumented use of materials from any source constitute academic dishonesty and may be grounds for a grade of 'F' in the course and/or disciplinary actions. For additional information, see the university catalog.

A&M-Texarkana Email Address: Upon application to Texas A&M University-Texarkana an individual will be assigned an A&M-Texarkana email account. This email account will be used to deliver official university correspondence. Each individual is responsible for information sent and received via the university email account and is expected to check the official A&M-Texarkana email account on a frequent and consistent basis. Faculty and students are required to utilize the university email account when communicating about coursework.

Drop Policy: To drop this course after the census date (see semester calendar**)**, a student must complete the Drop/Withdrawal Request Form, located on the University website https://www.tamut.edu/Admissions/Enrollment-Services/Registrar/Dropping.html) or obtained in the Registrar's Office. The student must submit the signed and completed form to the instructor of each course indicated on the form to be dropped for his/her signature. The signature is not an

"approval" to drop, but rather confirmation that the student has discussed the drop/withdrawal with the faculty member. The form must be submitted to the Registrar's office for processing in person, email Registrar@tamut.edu, mail (7101 University Ave., Texarkana, TX 75503) or fax (903-223-3140). Drop/withdraw forms missing any of the required information will not be accepted by the Registrar's Office for processing. It is the student's responsibility to ensure that the form is completed properly before submission. If a student stops participating in class (attending and submitting assignments) but does not complete and submit the drop/withdrawal form, a final grade based on work completed as outlined in the syllabus will be assigned.

Student Technical Assistance:

Solutions to common problems and FAQ's for your web-enhanced and online courses are found at this link: http://www.tamut.edu/webcourses/index.php?pageid=37

If you cannot find your resolution there, you can send in a support request detailing your specific problem here: http://www.tamut.edu/webcourses/gethelp2.php

Blackboard Helpdesk contacts:

Office hours are: Monday - Friday, 8:00a to 5:00p

Julia Allen (main contact) 903-223-3154 julia.allen@tamut.edu
Frank Miller (alternate) 903-223-3156 frank.miller@tamut.edu
Nikki Thomson (alternate) 903-223-3083 nikki.thomson@tamut.edu