

# **EENG 3410 - Engineering Electromagnetics**

## **Spring 2026**

### **Course Description**

Electromagnetic theory as applied to electrical engineering: vector calculus; electrostatics and magnetostatics; Maxwell's equations, including Poynting's theorem and boundary conditions; uniform plane-wave propagation; transmission lines – TEM modes, including treatment of general, lossless line and pulse propagation; introduction to guided waves; introduction to radiation and scattering concepts. Credit hours: 3 hrs.

**Prerequisite(s): EENG 2610, MATH 3310.**

### **Lectures**

- Class meetings NTDP B190, Tuesday and Thursday 10 am – 11:20 am
- Lecture notes and other supplementary materials will be posted on Canvas  
<https://unt.instructure.com/courses/138336>

### **Instructor**

Hung Luyen, Assistant Professor, Electrical Engineering Department

- Office: NTDP B232
- Office hours: 14:00-15:00 Tuesday & Thursday, or by appointment.
- Email: [Hung.Luyen@unt.edu](mailto:Hung.Luyen@unt.edu)

### **Teaching Assistant**

Huy Nguyen

- Office: NTDP B245
- Office hours: 15:00-16:00 Monday & Wednesday
- Email: [HuyNguyen33@my.unt.edu](mailto:HuyNguyen33@my.unt.edu)

### **Grade**

- Homeworks: 25%
- Quizzes: 25%
- Mid-term exam: 25%
- Final exam: 25%

### **Grade distribution**

A=90-100, B=80-89, C=70-79, D=60-69, F=0-59

### **Schedules of exams**

- Midterm: TBD
- Final: 7:30-9:30, May 7

<http://registrar.unt.edu/exams/final-exam-schedule>

### **Textbooks**

- Required: by Matthew Sadiku. Elements of Electromagnetics (The Oxford Series in Electrical and Computer Engineering) 7th Edition
- Optional: Microwave Engineering 4th Edition, David M. Pozar.

### **Class Evaluation by Students**

Student Perceptions of Teaching (SPOT) is a requirement for all organized classes at UNT and is available for your input at the end of the semester.

### **Topics**

- Vector Algebra, Chapter 1, sections 1.1 – 1.7
- Coordinate Systems and Transformation, Chapter 2, sections 2.1 – 2.4
- Vector Calculus, Chapter 3, sections 3.1 – 3.7
- Electrostatic Fields, Chapter 4, sections 4.1 – 4.10
- Electric Fields in Material Space, Chapter 5, sections 5.1 – 5.9
- Electrostatic Boundary Value Problems, Chapter 6, sections 6.1 – 6.5
- Magnetostatic Fields, Chapter 7, sections 7.1 – 7.7
- Magnetic Forces, Materials, and Devices, Chapter 8, sections 8.1 – 8.10
- Maxwell's Equations, Chapter 9, sections 9.1-9.7

### **Policies**

- Grades: All grades for the course will be final. No extra credit assignments or work will be considered after the final grade has been recorded.
- Homework policies:
  - Homeworks are due at the end of class on the due date. Solutions to the homework assignments will be posted on the course web page after the submission deadline.
  - Late assignments will not be accepted after 24 hours of the submission deadline. A 30% penalty is applied to accepted late assignments.

- It is fine for you to discuss homeworks with your classmates. However, each of you must write and turn in your own answer sheets. For copied assignments (e.g., two or more answer sheets that are too obviously similar), no credit will be given (equivalent to a zero grade).
- Exam & quiz policies:
  - Failure to show up for an exam/quiz results in receiving no credit for that exam. In such case, there will be no second chance for you to retake the missed exam, unless under very special circumstances (e.g., family or medical emergency).
  - Any academic misconduct (e.g., cheating, plagiarism) should be avoided at all cost. If two or (more) answer sheets are found to be almost identical (especially in the errors and mistakes), they will receive zero credits.
- Accommodations: The EE Department in cooperation with the Office of Disability Accommodation complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. Please present your written accommodation request before the 12th class day.
- Academic Dishonesty: Students caught cheating, plagiarizing, or any other academic dishonesty will be subject to penalty according to the new Policy on Students Standards on Academic Integrity. See full policy at [http://www.unt.edu/policy/UNT\\_Policy/volume3/18\\_1\\_16.pdf](http://www.unt.edu/policy/UNT_Policy/volume3/18_1_16.pdf)  
According to this policy the categories of academic dishonesty are:
  1. Cheating. The use of unauthorized assistance in an academic exercise, including but not limited to:
    - a. use of any unauthorized assistance to take exams, tests, quizzes or other assessments;
    - b. dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems or carrying out other assignments;
    - c. acquisition, without permission, of tests, notes or other academic materials belonging to a faculty or staff member of the University;
    - d. dual submission of a paper or project, or re-submission of a paper or project to a different class without express permission from the instructor;
    - e. Any other act designed to give a student an unfair advantage on an academic assignment.
  2. Plagiarism. Use of another's thoughts or words without proper attribution in any academic
  3. Forgery. Altering a score, grade or official academic university record or forging the signature of an instructor or other student.
  4. Fabrication. Falsifying or inventing any information, data or research as part of an academic exercise.

5. Facilitating Academic Dishonesty. Helping or assisting another in the commission of academic dishonesty.
6. Sabotage. Acting to prevent others from completing their work or willfully disrupting the academic work of others.

### Tentative Course Calendar

Week	Date	Topics	Reading
1	<b>01/13</b>	Introduction Vector Algebra	1.1-1.7
		Coordinate System and Transformations Base Vectors	2.1-2.4
2	<b>01/20</b>	Contours, Surfaces and Volume Del Operator	3.1-3.4
		Gradient Divergence Curl	3.5-3.7
3	<b>01/28</b>	Divergence Theorem Stokes' Theorem	3.6-3.7
		Electric Charge Coulomb's Law Electric Field	4.1-4.2
4	<b>02/03</b>	Charge Density Line/Surface/Volume Charge	4.3
		E-field Lines Electric Flux	4.3-4.4
5	<b>02/10</b>	Gauss's Law	
		Electric Potential Relationship between $\vec{E}$ and $V$	
6	<b>02/17</b>	Conduction and Convection Current Dielectrics and Conductors	4.5
		Ohm's Law and Resistors Polarization	4.7-4.8
7	<b>02/24</b>	Poisson's and Laplace's Equation	5.1-5.3

		Boundary-Value Problems	
	<b>02/26</b>	Capacitance in Boundary-Value Problem Resistance in Boundary-Value Problems	5.4-5.6
8	<b>03/03</b>	Electrostatics Review	6.1-6.2
	<b>03/05</b>	<b>Mid-Term Exam</b>	6.4-6.5
9	<b>03/10</b>	<b>Spring Break</b>	
	<b>03/12</b>	<b>Spring Break</b>	
10	<b>03/17</b>	Biot-Savart's Law	7.1-7.2
	<b>03/19</b>	Ampere's Circuit law Magnetic Flux Density	7.3-7.5
11	<b>03/24</b>	Magnetic Potential	7.7
	<b>03/26</b>	Forces due to Magnetic Fields	8.1-8.2
12	<b>03/31</b>	Magnetic Torque and Moment	8.3
	<b>04/02</b>	Magnetic Dipole	8.4
13	<b>04/07</b>	Magnetization	8.5
	<b>04/09</b>	Magnetic Boundary Condition	8.7
14	<b>04/14</b>	Faraday's Law	9.1-9.3
	<b>04/16</b>	Displacement Current	9.4
15	<b>04/21</b>	Maxwell's Equations	9.5
	<b>04/23</b>	Time-varying Potentials	9.6
16	<b>04/28</b>	Time-harmonic Field	9.7
	<b>04/30</b>	Magnetostatics Review	
17	<b>05/07</b>	<b>Final Exam</b>	