Phys 489.03E: Electricity and Magnetism

COURSE SYLLABUS: FALL 2025

INSTRUCTOR INFORMATION

Instructor: Dr. Blake Head
Office Location: Room 340, McFarland Science Building
Office Hours: TBA
University Email Address: Thomas.Head@etamu.edu
Preferred Form of Communication**: office hours or email**
Communication Response Time: I will do my best to respond to your e-mails as soon as possible, definitely within 24 hours.

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Recommended Text

Introduction to Electrodynamics, David J. Griffiths, 4th edition, ISBN: 9781108420419, Cambridge University Press or ISBN-13: 9780321856562, Pearson

Required Software

Zoom
Web browser with access to WTClass, PHYS 3330 TPC Mechanics 1

Course Description

Hours: 3
An advanced undergraduate course in theoretical electricity and magnetism. Geometry of static electric and magnetic fields, electric charges and currents, calculating electric and magnetic fields from potentials, fields inside matter, Maxwell's equations, and EM waves. Prerequisites: PHYS 2426, and concurrent enrollment in MATH 2415 or MATH 2320 or consent of instructor.

COURSE REQUIREMENTS

When you registered for this course, you agreed to take this course through the Texas Physics Consortium. Details about the Consortium are found here: https://www.tarleton.edu/tpc/. The syllabus posted on WTClass, the West Texas A&M

University's Learning Management System, is appended to the end of this document. That syllabus is the official syllabus for this course and lists all details, course requirements, etc. The instructor listed on that syllabus should be your official contact for this course; the listed ETAMU instructor is simply the local coordinator responsible for monitoring your progress and recording the final grade.

The grade you earn that is visible in WTClass is your official grade for this course; the ETAMU instructor cannot alter the WTClass grade.

TECHNOLOGY REQUIREMENTS

D2L (a.k.a. Brightspace, MyLEO Online, LMS)

All course sections offered by East Texas A&M University have a corresponding course shell in the myLEO Online Learning Management System (LMS). The link below gives technical requirements for accessing the LMS

LMS Browser Support:
https://community.d2l.com/brightspace/kb/articles/5663-browser-support

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@etamu.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

The *syllabus/schedule are subject to change.*

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook: https://www.etamu.edu/student-guidebook/

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: https://www.britannica.com/topic/netiquette

Mental Health and Counseling

The Counseling Center at ETAMU, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.etamu.edu/counseling-center

ETAMU Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01. https://inside.etamu.edu/admissions/registrar/generalInformation/attendance.aspx

Academic Integrity

Students at East Texas A&M University are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

https://inside.etamu.edu/aboutus/policiesproceduresstandardsstatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03.pdf

Artificial Intelligence

East Texas A&M University acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

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Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors 'guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty
13.99.99.R0.10 Graduate Student Academic Dishonesty

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Services
East Texas A&M University
Velma K. Waters Library 162
Phone (903) 886-5150
Fax (903) 468-8148
Email: StudentDisabilityServices@etamu.edu
Website: Office of Student Disability Resources and Services
https://www.etamu.edu/student-disability-services/

Nondiscrimination Notice

East Texas A&M University will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination, sexual harassment, and retaliation against any individual on the basis of race, color, religion, sex, national origin, age, disability, genetic information, veteran status, sexual orientation, gender identity, or any other legally prohibited basis. Such discrimination, harassment, and retaliation are violations of A&M System policy and will not be tolerated. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

The *syllabus/schedule are subject to change.*

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in East Texas A&M University buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and ETAMU Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:
https://inside.etamu.edu/aboutus/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all ETAMU campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

Sexual Harassment and Violence

Violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc.

If you or someone you know is a victim of harassment, stalking, domestic violence, sexual assault, or related crimes, has been harassed or assaulted, here are some resources for you:

24/7 Resources

- National Domestic Awareness Hotline: 1-800-799-SAFE (7223)
- National Sexual Assault Hotline: 1-800-656-4673
- National Suicide Prevention Lifeline: 988

Campus Resources

- **Call 911 in emergency situations**
- If you or someone you know has been impacted and needs support, email: CARE@etamu.edu (monitored Monday-Friday, 8am-5pm)
- Victim Advocacy and Support: https://www.etamu.edu/student-advocacy-support/victim-support-services/
- How to Help and Report: https://www.etamu.edu/student-advocacy-support/victim-support-services/
- How to Report Concerns About a Fellow Student: https://cm.maxient.com/reportingform.php?TAMUCommerce&layout_id=20
- University Title IX Compliance Office: https://www.etamu.edu/titleix/
- University Title IX Contact: Amanda Berry, 903-886-5991, TitleIX@etamu.edu

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- University Police Department Sexual Assault pages: https://www.etamu.edu/university-police-department/crime-prevention/
- University Counseling Center: https://www.etamu.edu/counseling-center/
- Campus police email: upd@etamu.edu

External resources:

Crisis center of Northeast Texas: http://www.ccnetx.org
Know your IX: https://www.advocatesforyouth.org/campaigns/know-your-ix/
End rape on campus: https://endrapeoncampus.org/
Clery Center for Security on Campus: https://clerycenter.org/
National Sexual Assault Online Hotline: https://hotline.rainn.org/online

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Course Information

Course Number: PHYS 3332.301
Course Title: Electromagnetic Field Theory
Section: 010
Semester: Fall 2025
Time: T, Th 11:00 AM – 12:15 PM
Location: This is a zoom class – Tarleton Students can come to science 209F
Credit Hours: 3
Zoom Class ID
Course Website: https://wtclass.wtamu.edu

TPC Campus Course Numbering

Midwestern State University	PHYS 3323	Texas A&M University-Corpus Christi	PHYS 3332
Prairie View A&M University	PHYS 3123	Texas A&M University-Kingsville	PHYS 3323
Tarleton State University	PHYS 332	Texas Southern University	PHYS 333
Texas A&M University-Commerce	PHYS 412	West Texas A&M University	PHYS 3340

Instructor Details

Instructor: Dr. Shaukat Goderya
Office: Science 213F
Phone: 254-968-9730
E-Mail: goderya@tarleton.edu
Office Hours: Online via zoom: Setup an appointment, For Tarleton Students in person possible

Communication Expectations

For TPC classes the best way for communication is via email. I will respond within 24 hours, if possible, otherwise within 48 hours. Course related materials will be posted on WT- Class.

Course Description

This course contains a mathematical introduction to electricity and magnetism, including electrostatics, Laplace's equation, the theory of dielectrics, magnetostatic fields, electromagnetic induction, magnetic fields of currents, and Maxwell's equations. This course is offered through the Texas Physics Consortium (TPC).

Course Requirements

1. Lectures: This is a TPC class and therefore taught online via zoom. Lecture recordings will be available on WT class. Note: Class for all campuses begin on August 26. Student at other campuses with different start date can view the recorded videos. Likewise, Thanksgiving break may be different on different campuses, at Tarleton we have no class on Wednesday November 22nd.
2. Homework: There will be several homework's in this course. Each homework will consist of about 5 - 10 problems. Homework will be assigned on the WT class and due in about 7-10 days. Penalty for late turn in is 20% of the weight of the homework every day, however waiver of penalty will depend on student explanation and frequency of late turn-in and posting of the feedbacks. No homework will be accepted if it is late by more than 5 days after the due date. Problems will be selected from the text book, or ones that I develop for the course. I may decide not to grade every problem on the homework, but I will try to provide either the hints to solution and/or the answer after the homework's are graded and returned. You can work out the answers and solutions in your own handwriting and scan your work as one pdf file and uploaded in the appropriate folder on WT class. The title of the pdf file should be course name, homework number and your name (example E&M-HW1-Shaukat Goderya). Each page should have your last name and homework number. The questions should be answered in order of the homework assignment problems. Failure to follow instructions may result in 20% penalty.

   The homework will be graded on the quality of your reasoning and math and how well they support the result obtained. Collaboration in figuring out how to approach the homework is permitted and encouraged, but you must work out and write up your solutions independently. **You need to be able to explain each step of your solution. Copying from your colleagues or manual solutions is forbidden and will result in grade of zero for that assignment.**

3. Exam(s): There will be 2 term exams and a Final Exam. Exams will be closed book and in class. You will be allowed to make and bring a formula sheet or I might provide one for you. A stand-alone scientific calculator is also allowed but no laptops or cellphones or applications there in are allowed. More details to come later.

Course Prerequisites

University Physics II (PHYS 2426), Calculus III (MATH 3433), or Differential Equations (MATH 3306) (Co-requisite

Course Learning Outcomes

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in

this process is making clear the course's student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

Student Learning Outcomes:
Upon successful completion of this course, students will:

1. Know Coulomb's law and be able to use it to solve for the electrostatic force applied upon a point charge by a collection of other point charges.
2. Know the definitions of standard terms in electromagnetism including electric potential, electric field, magnetic field, magnetic vector potential, induction, capacitance, etc.
3. Know the formula for the electric field due to an infinitesimal point charge and be able to use it to calculate the electric field due to either a collection of discrete point charges or a continuous surface, line or volume charge density.
4. Know the formula for the electric potential due to an infinitesimal point charge and be able to use it to calculate the electric potential due to either a collection of discrete point charges or a continuous surface, line or volume charge density.
5. Be able to find the electric field at a point in space given the electric potential
6. Be able to apply Gauss' Law to solve for the electric field in an electrostatic problem that involves a high degree of symmetry.
7. Be able to apply various solution techniques to solve Poisson's and Laplace's Equations.
8. Know the meaning of polarization, displacement vector, and dielectric constant and be able to use these concepts to solve problems involving dielectric media.
9. Be able to determine the magnetic field created by either a line, area, or volume current density.
10. Be able to write Maxwell's equations in both integral and differential form.
11. Be able to show that the solution to Maxwell's equations for time varying fields in free space are electromagnetic waves with the speed c.

Be able to apply mathematical techniques necessary to solve E&M problems including the application of vectors, vector and integral calculus

Textbook and/or Resource Materials

1. Required Textbook: *Introduction to Electrodynamics*, David J. Griffiths, 4th edition, ISBN: 9781108420419, Cambridge University Press or ISBN-13: 9780321856562, Pearson
2. Scientific Calculator
3. Account setup/access to WT-Canvas class at WTAMU (contact person Dr. Christopher Baird cbaird@wtamu.edu

A student of this institution is not under any obligation to purchase a textbook from a university-affiliated bookstore. The same textbook may also be available from an independent retailer, including an online retailer.

Generative AI and Large Language Models

AI tools can be used as additional learning resource and not to find solutions to homework problems and other assignments.

Grading Policy

Please refer to the current University Catalog for additional information regarding grades and course withdrawal policies. For this course, your grade will be determined in the following manner:

Student performance evaluation methods, including grading scale

Activity	Weight
Homework's	30%
Term Exams	40%
Final Exam	30%

Grade Scale
90 – 100.0% = A
80 – 89.99% = B
70 – 79.99% = C
60 – 69.99% = D
00 – 59.99% = F

Tarleton differentiates between a failed grade in a class because a student never attended (F0 grade), stopped attending at some point in the semester (FX grade), or because the student did not pass the course (F) but attended the entire semester. Other campuses may have similar policy, check with your class facilitator.

Grading Feedback Expectations

Homework's will be graded and posted on WT-Canvas class page. It may take me more than 2 weeks to complete the grading. Exams will be graded within one week.

Graded Class Participation

There is no participation grade for this class as it is a zoom online class.

Graded Attendance

Attendance is not enforced or graded since this is a zoom online class with video recordings posted on WT-Canvas class page.

Late/Make-up Work Policy

Homework

Late turn in penalty is 20%/day, waiver will depend on student explanation and circumstance and will be decided on case-by-case basis. Waiver will not be allowed if the student fails to turn in homework's on a regular basis.

Exam(s)

There are no makeup exams for this class other than your class facilitator may agree to proctor the exam at a different date and time than the rest of the class.

Course Schedule

Textbook Chapter to be covered (Tentative)

Chapter	Title
1	Introductions, Vector Algebra
2	Electrostatics
3	Special Techniques
4	Electric Fields in Matter
5	Magnetostatics
6	Magnetic Fields in Matter
7	Electrodynamics
8	Conservation Laws
9	Electromagnetic Waves

Learning Management System Usage (Blackboard -WTClass)

WTClass uses Canvas as LMS.

Important Dates

For Tarleton Campus. For your own local campus check with your class facilitator or campus academic calendar.
For more information, please see the Academic Calendar - https://catalog.tarleton.edu/universitycalendarsandfinalexaminationschedules.

- **Holidays and No-Class Days**
  - *Labor Day: (No Classes) Monday, September 1*
  - *Fall Break: (No Classes) – October 22-24*
  - *No Class: Wednesday November 26*
  - *Thanksgiving: November 27-20*
- **Grade-related Dates**
  - *See Academic Calendar*
- **Course Drop Deadlines**

- *See Academic Calendar*
- **Finals and Commencement**
  - *See Academic Calendar*

Technology Support – <Provide appropriate technical support information to inform students who to contact if they encounter technical difficulties (e.g., direct technical questions to the course teaching assistant; contact the vendor; etc.). Technical support information should include information such as who to contact, how to contact that resource, hours of availability, etc. >

Learning Resources

MIT Open Courseware
https://ocw.mit.edu/courses/8-07-electromagnetism-ii-fall-2012/pages/lecture-notes/

Schaum's Outline of Electromagnetics
(Any edition should help, but 4th and 5th are recommended)
Search on Amazon or other online stores.

University Policies

This is for Tarleton students, but you may have similar policies for your own local campus. Your class facilitator can provide more information. Your local campus policy will be applicable in your particular case.

Academic Integrity Statement and Policy

Cheating, plagiarism, or doing work for another person who will receive academic credit is impermissible. This includes the use of unauthorized books, notebooks, or other sources in order to secure or give help during an examination, the unauthorized copying of examinations, assignments, reports, or term papers, or the presentation of unacknowledged material as if it were the own work. Disciplinary action may be taken beyond the academic discipline administered by the faculty member who teaches the course in which the cheating took place. Consult the following links for further information on academic conduct.

- Student Judicial Affairs: https://www.tarleton.edu/judicial/academicconduct.html
- Student Handbook: https://www.tarleton.edu/studentrules/code-of-student-conduct.html

Americans with Disabilities Act (ADA) - Student Success

Tarleton State University is committed to complying with the Americans with Disabilities Act (www.ada.gov) and other applicable laws. If you are a student with a disability seeking accommodation for this course, please contact the Office of Student Accessibility Services at 254.968.9650, studentaccessibilityservices@tarleton.edu, or visit https://www.tarleton.edu/sas/

Academic Affairs Core Values in the Classroom

Academic Integrity

Tarleton State University's core values are integrity, leadership, tradition, civility, excellence, and service. Central to these values is integrity, which is maintaining a high standard of personal and scholarly conduct. Academic integrity represents the choice to uphold ethical responsibility for one's learning within the academic community, regardless of audience or situation.

Academic Civility

Students are expected to interact with professors and peers in a respectful manner that enhances the learning environment. Professors may require a student who deviates from this expectation to leave the face-to-face (or virtual) classroom learning environment for that particular class session (and potentially subsequent class sessions) for a specific amount of time. In addition, the professor might consider the university disciplinary process (for Academic Affairs/Student Life) for egregious or continued disruptive behavior.

Academic Excellence

Tarleton holds high expectations for students to assume responsibility for their own individual learning. Students are also expected to achieve academic excellence by:

- honoring Tarleton's core values.
- upholding high standards of habit and behavior.
- maintaining excellence through class attendance and punctuality.
- preparing for active participation in all learning experiences.
- putting forth their best individual effort.
- continually improving as independent learners.
- engaging in extracurricular opportunities that encourage personal and academic growth.
- reflecting critically upon feedback and applying these lessons to meet future challenges.

Student Rules

Students are responsible for knowing and abiding by the policies and information contained in the Tarleton Student Rules - https://www.tarleton.edu/studentrules.

TPC Policy

Since this is a TPC class. TPC policies will be in effect as well. Contact your class facilitator for details.

Disclaimer

The instructor reserves the right to make modifications to this information throughout the semester. The course schedule is tentative. The instructor reserves the right to change this syllabus at any time. Any changes will be announced in class in advance