PHYS 2426.02E
University Physics II
Electricity and Magnetism
COURSE SYLLABUS: Spring 2025

(xkcd.com/567/)

Instructor: Dr. Matt Wood (matt.wood@tamuc.edu)
Office Location: Science 344
Class time: MWF 2:00 – 3:50, STC 135
Office Hours: M-F 11-11:50, or by appointment (but drop-by is usually OK*)
Preferred Forms of Communication: email (Subject line: "PHYS2426…")
Email Response Time: 48 hours or less

Syllabus/schedule subject to change

COURSE INFORMATION

Textbook(s) Required:

Textbooks: OpenStax University Physics, Vol 2 (https://openstax.org/subjects/science). The "OS" books are free (PDF or online access), or you may purchase a hardcopy for $50. I do recommend that you purchase a physical copy of the textbook as that improves learning, but if nothing else do download a copy of the PDF so you have that readily available.

Course Description:

Physics 2426 is the second semester of a calculus-based physics sequence. University Physics II introduces electrical and magnetic phenomena in nature, including the concepts of electrical charges, electric and magnetic fields, the application of Gauss' Law, electric potential, conductors and insulators, currents, basic circuits, and induction.

University Catalogue Description

Second semester of calculus based physics with topics in electricity and magnetism for science, mathematics, and engineering students. Prerequisites: PHYS 2425 with a minimum grade of C, MATH 2413. Additionally, MATH 192: Calculus II, or concurrent enrollment.

Student Learning Outcomes

Students will be able to demonstrate the following skills when analyzing situations involving electrostatic fields and potentials and their sources, currents, voltage, capacitance, power, basic electrical circuits, magnetic fields and their sources, and induction:

1. Students will be able to conduct qualitative analysis which demonstrates physical and mathematical intuition and conceptual understanding.
2. Students will be able to perform quantitative calculations in situations involving electric and magnetic fields, and demonstrate knowledge of the relevant basic units, vector addition, and application of basic calculus. Students will be able to assess answers to questions for plausibility.
3. Students will be able to use simple laboratory demonstrations and computer simulations to explain the basic properties of electric and magnetic fields, and electrical circuits.

COURSE REQUIREMENTS/INFORMATION

Instructional Methods

We meet 6 hours a week, and there will be lectures where I'm explaining things and working examples, but we will also have time for group problem solving and tutorial/lab work at your tables. Bring your calculators every day. We will have weekly quizzes on Fridays where you will answer questions and/or work problems

from the previous week's work. These quizzes are open book and open (hand written) notes, but you can't search the internet (no laptops/phones allowed). You can work alone or with your table-mates on these quizzes.

Solving physics problems is a skill that is learned through **doing**. Successful athletes practice countless hours and spend further hours doing reps in the weight room so that they can perform at their best when it is game time. As a successful physics student, you need to spend countless hours working physics problems so you can perform at your best when it is exam time. **You can do this**, but you need to want to succeed enough to put in the time. You're building a foundational skill set – take the time to do it correctly and it will help in your future technical courses.

If you haven't thought about the topics in Physics 2425 for several months, please do just skim back through Chapters, re-read the example problems to help reinforce the learning you did last semester/year. You will be amazed how much just a few hours of doing this will help you in this course.

A note on reading the textbook: Many students take the wrong approach to reading textbooks; they try and read and understand every word, refuse to move on until they've understood everything in the present section, refuse to skip passages, and only read the material once. Reading textbooks is a skill: here is one of several good websites with instruction on how to acquire that skill.

http://www.dartmouth.edu/~acskills/success/reading.html

When reading textbooks, the aim is not to understand everything right away. You will likely need to read the chapters several times before and after covering the material in class to really feel like you're getting the material (I always had to read textbooks half a dozen times for the content to begin to sink in). The first time you read the chapter, you should skim it (this is the "preview" read discussed in the above website).

This is why I suggest you re-read the chapters from PHYS 2425 again these first few days of class. You've read them all before (right?), and this one 'last' time will bring a lot of that back to the working area your brain surprisingly quickly!

A note on "physics is hard": Yes, it is. It is for everyone, and it was for me (it was for Einstein, too). Some of you come from high school with great physics teachers and a lot of funding – you've had AP physics and calculus and are very well prepared. Many of you don't have this background at all. You may be in a group with someone that does, and they're "getting it" quickly while you're still struggling. This doesn't mean that the other person is innately talented and you are not – in most cases it just means that they have spent more time doing math and physics in the past than you have. You can do it – you just need to put in the time. This "genius" narrative – mistaking background for ability – can particularly negatively affect women and underrepresented minorities due to existing stereotypes about these

groups. In studio physics, we are hoping you will feel proud about yourself and your accomplishments. You can feel ownership for your contributions to your group; proud of your improvement; proud of challenging yourself; proud of your ability to discuss physics concepts with others, and more. Want to read more about this? Follow this link: https://aas.org/sites/default/files/2019-09/status_2015jun.pdf and read the essay on page 7 by Dr. Angela Little.

To succeed in this class

The biggest predictor for success in this (and any) class is the time, thoroughness, and effort you put into the work and reading set. The harder you work, the better you'll do. Therefore you need to aim to

- Attend all classes, and participate fully in group work
- Work lots of physics problems
- Complete and turn in all the work on time
- Read the textbook thoroughly, in the most efficacious way (see above)
- Ask for help when needed, and make sure you questions are specific
- Work more physics problems

GRADING

Item	Percentage of Class Grade
Homework Assignments	15%
Midterms (2)	45% (15% each)
Final Exam	20%
Quizzes and In-Class Work	20%
Class Participation	Up to 5%*

In addition, you can 1% course credit for coming to my office during the first week of class (STC 344) – office hours is best but not required! If I'm not there, take a selfie in front of the sign outside my office door, and email it to me.

Grading scale: (**NOTE:** Grades are not curved in this class – what you get is what you get!)

90 % < A
80 % < B < 89.99 %
70 % < C < 79.99 %
60 % < D < 69.99 %
F < 60%

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by East Texas A&M University have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

Zoom Virtual Classroom Requirements:
https://support.zoom.us/hc/en-us/articles/201362023-Zoom-system-requirements-Windows-macOS-Linux

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@tamuc.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

COURSE AND UNIVERSITY PROCEDURES/POLICIES

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.

University Specific Procedures

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://inside.tamuc.edu/admissions/registrar/documents/studentGuidebook.pdf.

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

ETAMU Attendance

For more information about the attendance policy, please visit the webpages below.

Attendance,

https://inside.tamuc.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 Students Academic Integrity Policy and Form

Undergraduate Academic Dishonesty 13.99.99.R0.03

https://inside.tamuc.edu/aboutus/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Undergraduate Student Academic Dishonesty Form

https://inside.tamuc.edu/aboutus/policiesProceduresStandardsStatements/rulesProcedures/documents/13.99.99.R0.03UndergraduateStudentAcademicDishonestyForm.pdf

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
Velma K. Waters Library- Room 162
Phone (903) 886-5930
Fax (903) 468-8148
Email: StudentDisabilityServices@tamuc.edu
Website: https://www.tamuc.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 and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

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:
http://www.tamuc.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.

East Texas A&M University Supports Students' Mental Health

Counseling Center Services

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.tamuc.edu/counsel**

COURSE OUTLINE / CALENDAR

This schedule is intended as a rough guide only and is subject to change; all due dates will be announced in class. Expect about 1 homework assignment per week.

Weeks 1-2	Vectors and Electric Force
Weeks 3-4	Electric Field & Gauss Law (Exam 1)
Weeks 5-6	Electric Potential
Weeks 7-8	Capacitance (Exam 2)
Week 9	Current and Resistance
Week 10	Direct-Current (DC) Circuits
Weeks 11-12	Magnetic Fields and Magnetic Force (Exam3)
Weeks 13-14	Sources of Magnetic Field
Week 15	Electromagnetic Induction and Inductance