

# Spring 2024 Syllabus

## PHYS 231: Electricity & Magnetism

### General Information:

**Instructor:** Dr. Nau Raj Pokhrel

**Office:** 214 Nielsen Physics Building, UTK

**Phone:** 865-974-5697

**Email:** [npokhrel@utk.edu](mailto:npokhrel@utk.edu) or, via the Canvas message system

**Office Hours:** Monday, 11:30 AM - 12:30 PM Via Zoom

(**Link:** <https://tennessee.zoom.us/j/84447553188>)

Tuesday & Thursday from 11:10 AM to 12:30 PM (in-person)

Wednesday from 11:30 AM to 12:30 PM (in-person)

Or by email appointment

**Lecture:** Asynchronous Online

**Lab:** In-person

**Lab Instructors:** Debraj Kundu ([dkundu2@vols.utk.edu](mailto:dkundu2@vols.utk.edu)) Sections 015 & 016

Prabodha Mudalige ([phewaraj@vols.utk.edu](mailto:phewaraj@vols.utk.edu)) Section 017

Adam Richardson ([aricha76@vols.utk.edu](mailto:aricha76@vols.utk.edu)) Sections 013 & 014

**Communication:** The majority of classroom communication will be conducted via Canvas for this class. The office hours/meetings will be conducted via Zoom. To ensure a prompt response from me, follow the email policy:

- Please put “**PHYS 231**” in the subject line of all course-related emails. This practice will help me identify course-related emails and respond promptly.
- You can expect delays in responding to emails; I will try to minimize such delays, but do not email me on the evening an assignment is due or before an exam expecting an immediate response.
- Before emailing me with questions about the course, please ensure that the information is not already provided in the course syllabus or on Canvas.

### Course Description & Goals:

- **Course Overview:** Physics 231 is a three credit-hour fundamentals of physics course with a laboratory for engineers and majors in mathematics and the physical sciences. This course covers the Fundamentals of electric and magnetic phenomena including DC and AC

circuits. The goal is to make you familiar with the concepts of electromagnetism and give you the skills needed to work with these concepts to solve problems in this field.

- We will cover the **Electromagnetism** section of the textbook (see the information below), which includes chapters 21 through 31. We will build heavily on concepts presented in your previous physics courses.
- The lecture portion of this course will be asynchronous online. I will post reading materials, lecture PowerPoints, and explained videos on Canvas. Please complete them every week as assigned on Canvas.
- However, the labs will be in person as scheduled for different sections.

**Pre/corequisites:** The course and text assume you are familiar with calculus and calculus concepts, as well as concepts in vector algebra. The prerequisite(s) of the course are PHYS 135 or PHYS 137 or EF 151 or EF 152, and the corequisite is Math 142.

## You will need the following materials for the course:

1. **Pearson MyLab and Mastering Physics for University Physics with Modern Physics (15th Edition) by Young and Freedman.** This is inclusive access content. **You don't need to pay it separately, and you don't need any access code.** For the first-time registration, you can follow the Assignments/VitalSource Bookshelf tab on the left sidebar in Canvas.
2. University Physics with Modern Physics (15th Edition) by Young and Freedman. **It is included in the Pearson MyLab, you don't need to purchase the print Textbook.** If you prefer the print textbook, you can have one, **but you do not need to purchase the current edition of the textbook.** The material does not change significantly between editions and any recent edition will meet your needs for the course.
3. **Lab manual and Macmillan Learning "Achieve"**. Your section TA will explain the details on the first day of the Lab. I'll post an instruction page on Canvas as well.

**Class Schedule:** The following is a tentative class schedule along with Chapter topics, assignments, etc. If there are any changes in the schedule, I will post on Canvas announcements. The changes made in the announcements supersede the schedule.

### PHYS 231: Spring 2024 Tentative Schedule (Flexible)

First day of the Class: January 23, Tuesday

Week	Chapter	Topic	Reading Quiz	Assignment
1	Chapter 21	Vector Review/ Electric Charge and Force	Quiz 1	
2	Chapter 21	Electric Field and Force Exerted by Field	Quiz 2	HW 1: Electric Charge and Coulomb's Law
3	Chapter 22	Gauss's Law	Quiz 3	HW 2: Gauss's Law

4	Chapter 23	Electric Potential	Quiz 4	HW 3: Electric Potential
5	Chapter 24	Capacitance and Dielectrics	Quiz 5	HW 4: Capacitance
6	Chapter 24/25	Capacitance and Dielectrics/Current		
7	<b>Mid-Term Exam I</b>	<b>Chapters 21-24 (5th March)</b>	Quiz 6	
7/8	Chapter 25/26	Current, Resistance and EMF/DC Circuit		HW 5: Current Resistance and EMF, DC Circuits
9	Chapter 26/27	DC Circuit/Magnetic Field	Quiz 7	
10	Chapter 27	Magnetic Field		HW 6: Magnetic Field and Forces
11	Chapter 27/28	Magnetic Forces, Sources of B Field	Quiz 8	
12	Chapter 28/29	Magnetic Flux		HW 7: Sources of Magnetic Field
13	<b>Mid-Term Exam II</b>	<b>Chapters 25-28 (16th April)</b>	Quiz 9	
13/14	Chapter 29/30	Electromagnetic Induction/Inductance	Quiz 10	HW 8: EM Induction
15	Chapter 30/31	Inductance/Alternating Current		HW 9: Inductance and AC
16	<b>Final Exam</b>	<b>Cumulative (Chapters 21-31) (9th May, Thursday)</b>		

**Course Repetition Policy:** If you are repeating the course, you may not need to repeat the laboratories. Please refer to the Laboratory policy regarding repeating the course (<http://www.phys.utk.edu/labs/Lab%20Repeat.pdf>).

**Reading Quizzes & Discussion Participation:** You will be responding to Reading quizzes on Canvas. You will have **only ONE attempt** for the quizzes. Your participation in the discussion forum on Canvas also includes the participation grade. Since it is an asynchronous class, I strongly encourage you to participate in discussions.

**Homework Assignments:** You will be assigned homework on MyLab and Mastering Physics. You can access them via the link provided on Canvas Assignments. You will have **THREE attempts** for each Homework, and the highest grade will be the HW grade. The assignments will be due on the indicated due date under the assignment module on Canvas.

**Midterm Tests:** There will be TWO midterm tests. I will publish them on Canvas on the test days (**see the tentative schedule**). I will open tests for a few hours window, but **you need to**

**complete them within 60 minutes** after you open them on Canvas. I will update an announcement on Canvas a couple of days before the tests.

**Final Exam:** The final exam will be available on Canvas on **9<sup>th</sup> May, Thursday**. If you determine that you have a conflict with that time or have three or more exams scheduled on that day, please let me know as soon as possible. **The Final Exam will be Two hours in length and cumulative in scope**, covering chapters 21 to 31 of the textbook.

The formula sheet is available on Canvas for quick reference.

**Laboratory:** The laboratory sections are mandatory. If you fail the Laboratory section of the course, you will fail the course regardless of your scores in class. Lab reports will be turned in to your Teaching Assistant. TAs are responsible for grading them. Please resolve any disputes regarding your laboratory grade with your TA. If you are unable to reconcile the issue, please contact me.

## Grading Scheme:

**Grades:** Your grade is calculated based on many elements of the course. See the table below for details on this.

Course Element	%
Laboratory	25%
Mid-Term I	12%
Mid-Term II	12%
Final Exam	20%
Regular Assignments	21%
Reading Quiz/Discussion Participation	10%
Total	100%

**Letter grade will be obtained using the conversion below:**

%	Grade
90% and above	A
87% - 89%	A-
83% - 86%	B+
80% - 82%	B

77% - 79%	B-
73% - 76%	C+
70% - 72%	C
67% - 69%	C-
63% - 66%	D+
60% - 62%	D
57% - 59%	D-
< 57%	F

**(Note:** The instructor reserves the right, when necessary, to alter the grading policy, change examination dates, and modify the syllabus and course content. Modifications will be announced on Canvas. Students are responsible for announced changes.)

### How to succeed and get a good grade in the class:

- Please communicate with me on time if you have any questions so that we can work together for success.
- This course assumes that you have a calculus background. There is not enough time in the course to review math basics in detail, so you must refresh your vector calculus, differentials, integrals, and non-Cartesian coordinate systems. This will help you follow the material presented in the lecture more thoroughly.
- Read the course material before attempting the quizzes and assignments, this relies heavily on how prepared you are.
- Even we are online, follow the class rules and behavior etiquette. Act in a matured/polite manner and be respectful of the learning process, your instructor, and follow the University guidelines for the meetings/communication.
- Solve examples before you start assignments. Read the textbook ACTIVELY. Active reading means reading the book with a pen and paper nearby. You should try to re-derive equations as you go and be critical of your understanding of how the book gets from point A to point B. Note any questions that you have so you can ask them in the discussion forum, via email, or during office hours.
- **Take advantage of all the help you can get, you will need it: Instructor office hours, Physics Tutorial Center help, Lab Instructor help, etc. Also, you are always appreciated for responding to the course-related questions asked by your classmates on the discussion forum.**

**Your Feedback/Suggestions on the course:** You are encouraged to provide feedback on any aspect of the course all through the semester using any communication method you prefer. Your **grades will not be impacted by any feedback** you provide, they will be purely based on your coursework and lab work. However, your discretion in these matters is expected.

You will also have an opportunity to give feedback at the end of the semester through the Course Evaluation System. Your feedback is critical in improving the course. Each year I take the information provided in feedback seriously so please take the time to fill out the feedback forms in a thoughtful manner.

## **Students with disabilities:**

The University of Tennessee, Knoxville, is committed to providing an inclusive learning environment for all students. If you anticipate or experience a barrier in this course due to a chronic health condition, a learning, hearing, neurological, mental health, vision, physical, or other kind of disability, or a temporary injury, you are encouraged to contact Student Disability Services (SDS). An SDS Coordinator will meet with you to develop a plan to ensure you have equitable access to this course. If you are already registered with SDS, please contact your instructor to discuss implementing accommodations included in your course access letter.

## **Student Disability Services Contact Information:**

1534 White Avenue

Blount Hall First Floor

Knoxville, TN 37996

Phone: (865) 974-6087

Fax: (865) 974-9552

Email: [sds@utk.edu](mailto:sds@utk.edu)

Website <https://sds.utk.edu/>

***For additional important information (Academic integrity, civility statement, UT alerts, ...) please see the Campus Syllabus ([Click here to download the Campus Syllabus](#)).***