

**PHYSICS 231**  
**SPRING 2023**  
**FUNDAMENTALS OF PHYSICS:**  
**Electricity and Magnetism**

**Instructor Information**

Instructor: Dr. Yang Zhang, Assistant Professor in Physics & Astronomy, and EECS

Office: 217A Nielson building

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

Communication: The majority of classroom communication will be conducted via Canvas for this class. To ensure a prompt response, please follow the email policy:

- Please put “**PHYS 231**” in the subject line of all course-related emails. This practice helps identify course-related emails.
- Before emailing, please ensure that the information is not already provided in the course syllabus or on Canvas.

**General Course Information**

Lecture Hours            08:00 – 08:50 am Mon/Wed

Location                 NIELSEN 415

Office Hours             09:30 – 10:30 am Monday

<https://tennessee.zoom.us/j/99430303133>

Laboratory Hours        *as scheduled for your section*

**General Course Description**

Physics 231 is a 3 credit-hour fundamentals of physics course with laboratory. This course covers the Fundamentals of Electricity and Magnetism (E&M). The goal is to make you familiar with the concepts of electromagnetism, and foster problem-solving skills in this field.

**Prerequisites**

Familiarity with calculus and calculus concepts, as well as concepts in vector algebra. A background in mathematics up to the level of Math 141-142, or equivalent, is highly recommended and is probably necessary for success in the course. The course also assumes that you are familiar with concepts in classical mechanics such as force, acceleration, work, kinetic and potential energy, and Newton’s laws, as taught in PHYS 135 or PHYS 137 or EF 151 or EF 152.

## Course Repetition Policy

If you are repeating the course, please refer to the [Laboratory Policy Regarding Repeating a Course](http://www.phys.utk.edu/labs/Lab%20Repeat.pdf) (<http://www.phys.utk.edu/labs/Lab%20Repeat.pdf>)

## Textbooks

You will need two books for the course:

1. **University Physics with Modern Physics** (15th Edition) by Young and Freedman. The course covers **chapters 21 to 32** only. The online version of the book is accessible via Canvas (VolBooks Course Materials - VitalSource). If you use a previous edition, please be aware and keep track of possible changes with respect to the 15th edition by yourself. The inclusive online access includes homework system access. For details, please see: [youtu.be/5HpBeu3G6gQ](https://youtu.be/5HpBeu3G6gQ).
2. **Contemporary Introductory Physics Experiments**, 2nd Edition by James E. Parks, Hayden- McNeil Publishing, ISBN 978-0-7380-6168-9. **You are required to purchase a current edition of the Laboratory manual. Please wait to hear from your TA for the details about the book and other lab resources.**

## Course Format

1. The course consists of two lectures per week, which does not leave enough time to cover every aspect of each chapter in detail. We will, therefore, proceed using a mix of traditional lecturing, and problem-solving demonstrations/active-learning exercises.
2. **For this approach to succeed, you have to come to the class prepared.** To complete the reading assignments as posted on Canvas before the class is strongly encouraged.

## Announcements, Lecture Notes, Course Updates

This syllabus and other important information and announcements will be posted on Canvas, as well as copies of the slides used in lecture. Your grades of in-class exams will be posted in the Canvas Grade-book, and your grades will be available for only you to see.

The homework website is entered from the course menu on Canvas. At the end of the semester, your homework and laboratory grades will also be posted on Canvas.

## Class Schedule

The following is a class schedule along with lecture topics, assignments etc. This is a tentative schedule and might differ as our class speeds. We will discuss in the class if there are any changes and notices made in the classes/announcements supersede the schedule.

## Class sessions:

1.	M Jan. 23	Introduction	
2.	W Jan. 25	Chap 21-I	
3.	M Jan. 30	Chap 21-II	
4.	W Feb. 1	Chap 22-I	1 <sup>st</sup> HW due
5.	M Feb. 6	Chap 22-II	
6.	W Feb. 8	Chap 23-I	2 <sup>nd</sup> HW due
7.	M Feb. 13	Chap 23-II	
8.	W Feb. 15	Chap 24-I	3 <sup>rd</sup> HW due
9.	M Feb. 20	Chap 24-II	
10.	W Feb. 22	Chap 21-24 Review	4 <sup>th</sup> HW due
<b>11.</b>	<b>M Feb. 27</b>	<b>Midterm #1</b>	
12.	W Mar. 1	Chap 25-I	
13.	M Mar. 6	Chap 25-II	
	W Mar. 8	Review or Break	5 <sup>th</sup> HW due
14.	M Mar. 20	Chap 26-I	
15.	W Mar. 22	Chap 26-II	
16.	M Mar. 27	Chap 27-I	
17.	W Mar. 29	Chap 27-II	6 <sup>th</sup> HW due
18.	M Apr. 3	Chap 28-I	
19.	W Apr. 5	Chap 28-II	7 <sup>th</sup> HW due
20.	M Apr. 10	Chap 29-I	
21.	W Apr. 12	Chap 29-II	8 <sup>th</sup> HW due
22.	M Apr. 17	Chap 25-29 Review	
<b>23.</b>	<b>W Apr. 19</b>	<b>Midterm #2</b>	
24.	M Apr. 24	Chap 30-I	
25.	W Apr. 26	Chap 30-II	9 <sup>th</sup> HW due
26.	M May. 1	Chap 31-I	
27.	W May. 3	Chap 31-II	
28.	M May. 8	N/A	10 <sup>th</sup> HW due
<b>Thursday May. 17</b>		<b>FINAL EXAM (8:00 a.m. – 10:15 a.m.)</b>	

## Grading & Evaluation

The semester Grade will be based on **Weighted Averages** of the homework assignments, in-class participation (clickers), the laboratory, two 50-mins exams, and the final exam as follows:

<b>Homework</b>	<b>30%</b>
<b>In-class Quiz/Discussion participation</b>	<b>15%</b>
<b>Laboratory</b>	<b>25%</b>
<b>Two 50-mins In-Class Exams</b>	<b>20%</b>
<b>Final Examination (2-Hour test)</b>	<b>15%</b>

## Homework:

You will be assigned homework on MyLab and Mastering Physics. **Course ID: zhang53145**

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. You will need to sign up. Each problem set will generally be available online at 12:00 (noon) each Wednesday and will be due at 11:00 pm the next Wednesday. Exceptions (for example during Spring Break and exam week) will be noted in class. **Due dates for problem sets are firm. Please note: No extensions or make-up problem sets will be given.**

**In-class Participation:** In the class, you will be given reading quizzes (in the form of clicker questions) at the beginning of the lecture and additional clicker questions that will contribute to your reading/participation credit. The reading quiz questions are 2 points each. The other clicker questions are 1 point for the wrong answer and 2 points for the correct answer. Find more information about the clickers in Canvas.

**Laboratory attendance is strictly mandatory.** Work will be graded by each Lab Instructor independently. An effort will be made to ensure a uniform grading policy between different laboratory sections. Laboratory make-ups are entirely at the Lab instructor's discretion and arrangements for such must be made with the Lab instructor directly. The laboratory exercises are an important and integral part of this course and have to be completed before a final grade will be assigned. You must complete all of the Laboratory assignments. Please note: **If you fail the Laboratory part of the course, you automatically fail the entire course.** You find the laboratory schedule in the announcement.

The **In-Class Exams** will be closed book and last 50-min, but a list of useful equations and constants will be provided. Questions and Problems on the Exams will generally NOT require only a purely numerical answer (like the homework). Exam and Final Exam questions will generally be similar in character to example problems in the book and example problems given during lectures. For the Exams, you are required to bring a pencil and a non-programmable pocket calculator. In particular, no laptops, cell phones, or other means of communication are allowed.

**The Final Exam is mandatory.** Missing the final exam is very serious and may result in the course's failure.

The final exam will be given on May. 17th 2023, 8:00 a.m. – 10:15 a.m. The Final Exam will be two hours in length and cumulative in scope, covering chapters 21 to 31 of the textbook. A formula sheet will be available for each exam for quick reference, and you are welcome to prepare your own on an A4 paper.

NO MAKE-UP Exams WILL BE GIVEN! No Exam score will be dropped and ordinarily make-up Exam will NOT be given. However, if there are extremely serious circumstances supported by proper documentation, a make-up for an Exam and/or Final may be considered at my discretion.

<https://registrar.utk.edu/wp-content/uploads/sites/38/2022/11/Spring-2023-Final-Exam-Schedule-Draft-for-Web-Word-Version.pdf>

## Conversion to Letter Grades

A	90 - 105
A-	85 - 89
B+	80 - 84
B	75 - 79
B-	70 - 74
C+	65 - 69
C	60 - 64
C-	55 - 59
D+	50 - 54
D	45 - 49
D-	40 - 44
F	0 - 39

## Questions and Appeals

I encourage you to ask questions during the lecture or/and talk to me during my office hours (Monday or by appointment – just ask after class) about the subject. You can discuss with me and/or complain to me about the grading of a given assignment, homework, Short Exams, or Final Exam. Any appeal will be entertained if it is raised no later than one week after the date on which the graded Exam/ Lab/HW is made available for return to the class. After this “appeal period” of one week, exam grades will be considered final and will not be altered. Any appeal concerning a grade in the Laboratory should directly be discussed with your Lab instructor.

## 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. 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!

## For 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 kinds of disability, or a temporary injury, you are encouraged to contact Student Disability Services (SDS) at 865-974-6087 or [sds@utk.edu](mailto:sds@utk.edu). 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 the accommodations included in your course access letter.

## Academic Honesty

*All work submitted by a student is expected to represent his/her own work. Students are expected to enter their own homework without assistance from others. Students are expected to perform all work in conformance with the University policies regarding Academic Honesty.*