

Physics 4B - Physics for Scientists and Engineers: Electricity and Magnetism - Winter 2017

Sections	PHYS004B.63 CRN: 34070; PHYS004B.64 CRN: 34879
Instructor	Dr. Patrick Huet
Email	huetpatrick@fhda.edu
Office	S13
Office Hours	Mon. & Wed. 4:30 - 5:20 PM
Lecture Hours	Mon. & Wed. 5:30 - 7:45 PM
Lecture Room	S35
Lab Room	S17
Textbook	Physics for Scientists and Engineers by Serway and Jewett, 9th edition
Prerequisites	Successful completion of Math 1B, Physics 4A
Corequisites	Concurrent enrollment in Math 1C
Final Exam Date	Monday, March 27, 6:15-8:15 PM
Course Website	Masteringphysics.com, courseID: MPHUET60738

Course Description:

This is Physics for Scientists and Engineers: Electricity and Magnetism - A calculus-based course in Classical Electrodynamics with a study of DC and AC circuits.

Electromagnetism was synthesized by J. C. Maxwell during the 19th century into four fundamental laws. The goal of this course is to understand the four Maxwell equations of classical electrodynamics in integral form and the Lorentz force equation and to solve problems using them.

A tentative schedule with an outline of the topic covered each week is appended at the end of this syllabus.

Textbook and additional reading:

Our official textbook is *Physics for Scientists and Engineers* by Serway and Jewett, 9th edition. This is the recommended edition, although other editions are acceptable. This edition can be found in the bookstore. Other textbooks can be considered. An example of a good alternate textbook is *Sears & Zemansky's University Physics* by Young and Freedman, 13th Edition – Please consult with your instructor before purchasing an alternate textbook.

Supplemental and optional reading material will be posted on the course website as the course progresses. The course website is masteringphysics.com and will also be used for homework, announcements and other documents sharing. A one-time registration is required (about \$69). An access code can be purchased during online registration.

Student Learning Outcomes:

Critically examine new, previously un-encountered problems, analyzing and evaluating their constituent parts, to construct and explain a logical solution utilizing, and based upon, the fundamental laws of Electricity and Magnetism.

Readings and Class Participation:

You are expected to be in class at the beginning of each lecture for the duration of the quarter. Attendance will be collected at the beginning of each lecture. If you miss three or more lectures, you will be dropped from the course. This course includes class discussions and collaborative activities. Lectures may provide supplemental information not found in the textbook that is critical for quizzes and exams. Part of your final grade will depend on your contributions in class. Make sure you do the assigned reading prior to the class, so that you are prepared to answer questions and participate effectively.

Homework and Quizzes:

Homework problems are assigned weekly in pace with each chapter of the textbook, and are completed online on [masteringphysics.com](https://www.masteringphysics.com). Grading is done automatically - Remember that you need to create an account to access this website. Once logged on, your calendar will show you the homework assignment as well as its due date. For material that depart from the textbook, additional assignments may be provided in the form of reading of science articles and question/problem sets or essay questions.

There will be frequent quizzes on some of the Wednesdays. The questions on the quizzes will test your knowledge of the recent weeks' homework problems, lecture material, and textbook reading assignment. Therefore, it is to your advantage to attend every lecture and have **ALL** the homework completed timely. The quiz format may be work-out problems, multiple-choice, conceptual, or a combination of the three. The lowest quiz score will be replaced by the average of quiz scores. **NO MAKE-UP QUIZZES!** There will not be make-up quizzes. If you miss a quiz and you are not excused, then your score is a zero; if it is excused then the missed quiz grade will be the average of your other quiz grades.

Laboratory:

This course has a companion lab course that consists in about 8 to 10 laboratory experiments and one final lab exam. All lab experiments are conducted in groups. Students within each group are encouraged to collaborate on discussing the experiment, doing the data analysis and redacting a lab report, if one has been requested.

Each student will maintain a lab book for each experiment conducted. The lab book will be kept in the lab classroom unless required for redacting a lab report, if requested. The lab book will be periodically checked and graded either on completion or on content.

The final lab grade will consider class attendance and participation, content of lab book, quality of lab reports, and final exam.

Laboratory Objectives:

1. Maintain a legible, coherent and useful lab book utilizing extended written passages.
2. Take accurate measurements with confidence and understand the uncertainties associated with them.
3. Analyze data using graphical, statistical, and computer based techniques.
4. Analyze data to induce scientific conclusions.
5. Collaborate with others as a team to produce collective and reproducible results.
6. Collaborate with others as a team to publish a lab report to convey reproducible results.

Lab Policy:

Laboratory experience is critical for any person entering a scientific or technical field. All lab reports should be written by each individual student even if the lab is done with other students. Lab reports will emphasize error analyses; an experiment without error analysis is essentially worthless. You will be taught how to do proper error analysis using a variety of techniques.

Students must be on time for lab. If you are late then you lose points proportionately for the time you are late. You are not allowed to receive credit for a lab if you are more than 30 minutes late. Students are only allowed a certain number of late-nesses and absences.

There will be no makeup lab; a student missing a lab session will receive a grade of zero for the missed lab report and/or content of the lab book. A makeup grade can be arranged only in case of emergency absence and after a written proof of the cause of the absence is provided. Students must notify the instructor of any planned absence in advance.

You are dismissed from a lab for the day after you have the instructor's permission to leave. Although you may leave the lab for a *short* time and then return, attending lab and leaving early for the day without explicit permission from the instructor will constitute an unexcused absence.

Students must adhere to lab and equipment safety, to be reviewed at the beginning of each lab. All materials and equipment used during the lab must be returned to their appropriate locations by the end of each lab.

Every lab requires the following items:

1. A *quadrille* ruled (looks like graph paper), non-spiral bound lab book. This book will be kept permanently in the lab after you bring it the first day.
2. A pen *and* pencil.
3. A ruler.
4. A scientific calculator. It would be helpful if your calculator could perform statistical functions, but it is not required.

The Lab book is a critical component of the course and must be kept up-to-date and be well-maintained. Lab reports are designed to convey crucial information and must be well-organized, concise and accurate.

The LABS SKILLS MANUAL is recommended and will be reviewed with your instructor on the first lab day.

Exams:

There will be a comprehensive final exam at the end of the course and two midterm exams set in class time (see tentative schedule below.) Both midterms will count toward your final score but the lowest of your two

midterms grades will be given 1/2 of the weight of the other midterm when calculating your midterm average. There will be no make-up tests. In order to do well on the exams, attend all classes, read the textbook, review the quizzes, and do the homework problems. To get credit for the answer on an exam, you must make it clear that you understand the reasoning that got you to the answer.

There will be a lab exam on the last week of class.

Grading Policy:

A+	97-99%
A	93-96%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	60-76%
D	50-59%
F	0-49%

Labs	10%
Homework & Quizzes	10%
Midterm I	20%
Midterm II	20%
Final Exam	40%

Grading of homework, quizzes, presentation, and exams will emphasize conceptual understanding and critical thinking. Outstanding students' participation contributes to the final grade and is a critical factor in rounding off to the final grade (Extra credits). The calculated percentage will be rounded to the nearest whole number. The grading scale shown above is firm. Although unlikely, all tests and assignments may be curved, slightly. Being close to a grade does not entitle a student to that grade (89.4% is a "B+", 89.5 % is an A-).

Academic Integrity:

Students must adhere to the general principles of academic integrity. Plagiarism or other form of violation of academic integrity may result in a failed grade.

Disability Support Services:

Let your instructor know if you need any support in that regard.

Tentative Schedule (subject to change at the discretion of your instructor):

PHYSD004B63 CRN: 34070 and PHYSD004B64 CRN: 34879 - Winter 2017 CALENDAR (12 Weeks)				
	M Date	MONDAY 5:30-7:45; Lab 8:00 - 10:50	WEDNESDAY 5:30-7:45; Lab 8:00 - 10:50	
1	9-Jan	9 Ch 23 Electric Fields	11 Ch 23 Electric Fields	
2	16-Jan	16 Martin Luther King's Birthday	18 CH 24 Gauss's Law	21 Last date to ADD
3	23-Jan	23 CH 24 Gauss's Law CH 25 Electric Potential	25 CH 25 Electric Potential	22 Last date to DROP
4	30-Jan	30 Ch 26 Capacitance and Dielectrics	1 Ch 26 Capacitance and Dielectrics	3 Last date Pass/No
5	6-Feb	6 Ch 27/28 Current and Resistance and DC Circuits	8 Ch 27/28 Current and Resistance and DC Circuits Review	
6	13-Feb	13 MIDTERM I	15 Ch 29 Magnetic Fields	
7	20-Feb	20 Ch 29 Magnetic Fields	22 CH 30 Sources of the Magnetic Fieds	
8	27-Feb	27 CH 30 Sources of the Magnetic Fieds	1 Ch 31 Faraday's Law	3 Last date to W
9	6-Mar	6 Ch 31 Faraday's Law	8 MIDTERM II	
10	13-Mar	13 Ch 32 Inductance	15 Ch 32 Inductance	
11	20-Mar	20 Ch 33 Alternating-Current Circuits LAB EXAM for 34879 (8:15-10:15 p.m.)	22 Ch 33 Alternating-Current Circuits Review LAB EXAM for 34070 (8:15-10:15 p.m.)	
12	27-Mar	27 FINAL EXAM (6:15-8:15 p.m.)	29 No Class	31 Class End