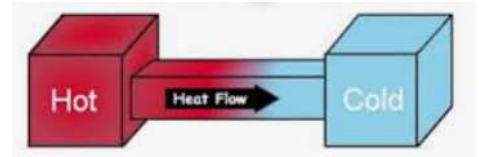


# Physics for Scientists and Engineers

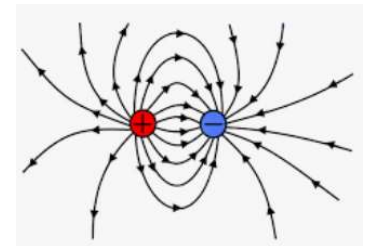
SPRING 2020

PHYS 4B

Section #55130



**Instructor:** Dr. John Heathcote  
**Class Times:** MWF 8:00-9:50am, PHY-76  
(Lectures and Labs will both occur during these times.)  
**Office:** FEM-1B (in the math study center)  
**Phone:** (559) 638-0300 ext. 3215  
**e-mail:** [john.heathcote@reedleycollege.edu](mailto:john.heathcote@reedleycollege.edu)



**Office Hours:**  
MWF 10:00-10:50am  
Th 12:00-1:50pm

If you cannot make regular office hours, feel free to make an appointment.

**Prerequisite:** PHYS 4A  
**Corequisite:** MATH 6  
**Advisory:** ENGLISH 1A

## Welcome to your second semester in Calculus-Based Physics!

I am happy to be working with you this semester in PHYS 4B! In this course, we will wrap up some topics in mechanics, work through the interesting field of thermodynamics, and then transition into electricity. Along the way, we will further our physics knowledge and problem-solving skills.

Similar to PHYS 4A, this class will teach you much about the world in which you live. Once you have worked through physics, you no longer see the world in the same way!

I look forward to working with you in this class! This is a challenging topic, but we can work together so that you can be successful!

**Catalog Description:** The topics covered in this course include: Mechanical waves, Thermodynamics, electricity, magnetism.

**Required Textbook:** Physics for Scientists and Engineers, with Modern Physics, Douglas Giancoli, 4<sup>th</sup> Edition, Pearson

- This is the same book that was used in PHYS 4A at Reedley College. It will also be the same book you will use in PHYS 4C.
- Although a new book is very expensive, there are many cheaper, used books available online.

<b>Grading:</b>	60%	Tests and Final Exam
	20%	Homework and In-Class Problems
	10%	Laboratory Activities and Reports
	10%	Presentation

**Tests and Final Exam:** There will be three tests and one final exam during the term. The first three will cover approximately four chapters each. The final exam will be given during our scheduled final exam time (Monday, 5/18, 8:00-9:50am) and will cover the topics from the entire semester. Rules for what students are allowed to use during each test and exam will be announced.

**Tentative Test Dates:** 2/21, 3/27, 5/8, 5/18

**Homework:** Homework will be assigned in order to practice the concepts and problem-solving skills taught in class. These will be handwritten assignments. You are required to show complete diagrams and full working of your problem solving for each assignment. Grades will be based upon both completeness, accuracy, and neatness. The homework is very important. Not only does it count for a significant portion of the overall grade, it will also be very useful practice for the problem solving techniques taught in this class.

**Use of Posted Solutions:** The solutions to the textbook problems are available at many locations online. You are allowed to look at these solutions as you complete your assignments. However, what is most important is that you understand these solutions. If you blindly copy solutions to homework problems, you are setting yourself up for failure on the exams.

**In-Class Problems:** With our two-hour class periods, we will often have a short problem-solving session during the second half of the period. This is a time to practice problem-solving in an interactive environment. Students are encouraged to work together in groups during this time to help each other learn the material. **These activities will be a portion of the Homework and In-Class Problems grade.**

**Presentation:** In order to see how the concepts of physics are applied to modern technology, students will research, prepare, and present about an application of the topics we learn during this semester.

**Late Work Policy:** It is very important that you submit all of your work (homework and in-class work). Late submissions will not receive full credit. However, it is much better to submit work late than to not submit it at all.

**Test Absence Policy:** Test dates will be announced well ahead of time. If you have a reason why you will be absent for a test, you need to let me know as soon as possible so that we can arrange a make-up time for you. If you are sick (or have some other reasonable excuse) on the day of a test, you need to contact me (by email, Canvas message, or phone call) to let me know that you are unable to attend. If I do not hear from you by the time of the test, I have no alternative but to give you a zero on the test.

<b>Grading Scale:</b>	90-100%	A
	80-89.9%	B
	70-79.9%	C
	60-69.9%	D
	<60%	F

**Accommodations for Students with Disabilities:**

If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

<b>Add Date:</b>	Friday, January 31	Last day to add a course
<b>Drop Date:</b>	Friday, March 13	Last day to drop this course
<b>Holidays:</b>	Monday, January 20	Martin Luther King Jr. Day
	Friday, February 14-Monday, February 17	Presidents' Day Holidays
	Monday-Friday, April 6-10	Spring Break
<b>Final:</b>	Monday, May 18, 8:00-9:50 am	

## Course Outline:

Unit	Chapters	Topics	Weeks
A	13-16	Fluids, Oscillations, Wave Motion, Sound	1-6
B	17-20	Temperature, Thermal Expansion, Ideal Gas Law, Kinetic Theory of Gases, Heat, The Laws of Thermodynamics	7-11
C	21-24	Electric Charge, Electric Field, Electric Potential, Capacitance, Energy Storage	12-16
D	Review	Review of Semester	17

## COURSE OUTCOMES:

Upon completion of this course, students will be able to:

- . apply basic concepts and fundamental laws in electricity and magnetism.
- . understand the relationship between temperature and molecular kinetic energy.
- . apply the First Law of Thermodynamics.
- . calculate the electric potential of various charge configurations.
- . differentiate the heat transfer mechanisms of conduction, convection, and radiation.
- . relate electric field and electric potential.
- . solve basic problems involving electrical circuits.
- . solve problems in thermal expansion.

## COURSE OBJECTIVES:

In the process of completing this course, students will:

- complete assignments and lab reports outside of class requiring the application of concepts studied in class.
- develop new ideas using previously held knowledge as their foundation.
- use problem solving processes developed in this course requiring sound reasoning skills that enhance responsible decision-making.
- use the appropriate language of physics and mathematics in order to solve problems in physics.
- use the scientific method for experiments illustrating basic ideas in physics, producing results which must be compared and/or correlated with what has been presented in class lectures.