

# Physics 4B Syllabus

Hartnell College • Fall 11

## Principles of Community:

Above all, this class is a learning community. The principles of that community have been determined by you as follows:

- everyone participates
- speak freely and ask questions
- respect opinions
- work as a team
- don't cheat or copy
- don't leave all the work for one person in your group
- share opinions and comments
- attendance is very important
- arrive on time!
- bring a good attitude and be prepared for class
- help and encourage each other
- be dedicated and work hard
- complete assignments on time
- constructive criticism is good
- everyone is responsible for helping when someone doesn't understand
- approach the class with energy to learn

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## Physics

**Webpage:** <http://www.hartnell.edu/physics>

## Office

**Hours:** M, F 1-2 pm , and by appointment (I am often in my office and happy to discuss physics outside of official "office hours")

## Required Materials:

- **Fundamental of Physics**, 8th Edition, Halliday, Resnick, and Walker
- 1 spiral bound notebook suitable for a journal
- 15 cm clear plastic ruler
- scientific calculator
- usb / thumb drive

**Course Objectives:** You will be expected to have gained a thorough understanding of physics by attending all class meetings, actively participating in the learning community, and completing all assignments.

In addition the learning outcomes of the course are as follows:

- Given information about a simple collection of electric charges, a student will be able to characterize the electric and magnetic fields caused by these charges and predict the behavior of other charges under the influence of these fields.
- Given information about a simple electrical circuit, a student will be able to describe the flow of charge and energy through the circuit and do quantitative calculations that predict the behavior of the circuit.
- Given appropriate direction, a student will be able to set up simple electrical circuits safely, use meters, oscilloscopes and other basic electrical equipment to perform measurements on these circuits, perform calculations based on data collected from these measurements and draw meaningful conclusions from these calculations.
- Given information about the electric and magnetic properties of some region, a student will be able to describe the production and propagation of electromagnetic waves in that region.

**Course Content:** Chapters 21- 33 in **Fundamentals of Physics**

**Attendance:** Attendance will be taken at the beginning of each class session. The standard attendance policy from the Hartnell Schedule of Classes will be adhered to:

“Any lack of attendance which leads an instructor to judge that unsatisfactory progress is being made may result in the student being dropped. Absence from a full semester class in excess of two weeks (consecutive or non-consecutive) may result in the instructor dropping the student. That is, a student may be dropped after missing one more class meeting than twice the number of class meetings per week”

This amounts to 11 absences, excused OR unexcused. In addition, 3 tardies can be counted as 1 absence.

**Cell phones:** If your phone rings during class or lab, you will be obligated to bring snacks for the next class meeting. This policy applies if you are caught texting or otherwise using your phone inappropriately\* during class or lab time. (\* this includes using your phone as a calculator; as per the supplies list, please have a scientific calculator separate from your phone.)

**Homework:** Homework problems will be assigned and collected weekly. Assignments will be given out in class as well as online. Working problems is one of the most important ways you can learn the material in a physics course. Working outside of class with classmates is an excellent way to get the homework done and get the most out of the assignments.

The homework will be graded:

- for completeness
- one problem will be selected and graded in a detailed way

Only two late homework assignments will be allowed for credit.

**Laboratory:** You will be doing an experiment or exercise each week in the laboratory section of the course. Details will be given to you during the first laboratory session.

**Note:** Experiments must be completed for at least  $\frac{3}{4}$  of the scheduled labs or no credit will be given for the entire course.

**Celebrations of Learning:** Several one-hour “celebrations of learning” will be given throughout the course. They will generally consist of three problems reflective of class discussions. One or more of the problems may be taken from the homework assignments. Sample Exam problems may also be found on the website. You are allowed one 3x5 inch card with formulas (including the final). If you use anything larger than a 3x5 card, points will be deducted. In addition you will be expected to rework each exam (if the score is lower than an A). In return, at the conclusion of the semester you will receive half of the points back on your exam with the lowest score. A reworked exam is due one week after the exam is turned back.

No makeups will be given without a prior arrangement agreed upon between student and instructor. Make-up “celebrations” will be partially verbal.

**Journals:** You will be expected to keep a physics journal. Each day there is a class meeting, you will be expected to make an entry of your learning and observations. The journal will be collected periodically and checked for a grade. Journal entries are only to be made **after class**. If a journal entry is made in class, it will be taken away for the day.

**Academic Dishonesty / Cheating:**

As per the Hartnell policy from the Schedule of Classes:

“ Dishonesty includes, but is not limited to, in-class cheating, out-of-class cheating, plagiarism, knowingly assisting another student in cheating or plagiarism, or knowingly furnishing false information to College staff, faculty, administrators or other officials. Following are definitions of in-class cheating, out-of-class cheating, plagiarism, and furnishing information. These are not all-inclusive, and the list itself is not meant to limit the definition of cheating to just those mentioned.

1. In-class cheating: during an examination or on any work for which the student will receive a grade or points, unauthorized looking at or procuring information from any unauthorized sources or from any other student’s work.

2. Out-of-class cheating: unauthorized acquisition, reading or knowledge of test questions prior to the testing date and time; changing any portion of a returned graded test or report and resubmitting as original work to be regarded; or presenting the work of another as one’s own for a grade of points.

3. Plagiarism: unauthorized use of expression of ideas from either published or unpublished work(s) as a student’s own work for a grade in a class. This also includes the violation of copyright laws, including copying of software packages.

4. Furnishing false information: forgery, falsification, alteration, or misuse of College situations.”

If a student is discovered to be cheating, a zero will be given on the assignment immediately and a meeting with the instructor will be scheduled. If a second instance occurs, the prior policy will be invoked in addition to further action taken with administration and the possible result of a failing grade in the course.

**Final Grade:** Your grade in the course will be based on the total number of points\* you receive for the following:

Item	Points (approximate)	% of Total (approximate)
Laboratory	100	10
Journals	100	10
Homework	100	10
Quizzes	75	10
Celebrations of Learning	300	35
Final Celebration	200	25

Final grades will be determined by calculating the percentage of your total points earned relative to the total possible points for the course and then applying that percentage to the following table:

Letter Grade	Percentage
A	90 - 100%
B	80 - 89%
C	70 - 79%
D	60 - 69%
F	0 - 60 %

\*Additional points for extra credit projects, extra or fewer “celebrations of learning”, the Physics Olympics and other subjective factors may change these percentages somewhat.

The Final Celebration of Learning for this class will be given Friday, December 16 from 8 - 11 am.

**Tentative Schedule of Topics:**

<b>Week Starting</b>	<b>Topic</b>	<b>Chapter</b>
Aug 15, 2011	Electric Charge	21
Aug 22, 2011	Electric Fields	22
Aug 29, 2011	Gauss' Law	23
Sep 5, 2011	Gauss' Law / Celebration 1	23
Sep 12, 2011	Electric Potential	24
Sep 19, 2011	Capacitance	25
Sep 26, 2011	Current and Resistance	26
Oct 3, 2011	Circuits	27
Oct 10, 2011	Circuits / Celebration 2	27
Oct 17, 2011	Magnetic Fields	28
Oct 24, 2011	Magnetic Fields due to Currents	29
Oct 31, 2011	Magnetic Fields due to Currents	29
Nov 7, 2011	Induction and Inductance	30
Nov 14, 2011	Electromagnetic Oscillations and Alternating Current	31
Nov 21, 2011	Electromagnetic Oscillations and Alternating Current / Celebration 3	31
Nov 28, 2011	Maxwell's Equations	32
Dec 5, 2011	Electromagnetic Waves	33

**Homework Assignments:**

**Chapter 21:**

Questions: 2, 3, 8  
Problems: 2, 8, 15, 17, 28

**Chapter 22:**

Questions: 2, 3  
Problems: 2, 9, 12, 19\*, 21\*\*, 25, 26, 37, 52  
(\*use the binomial expansion, \*\*extra credit)

**Chapter 23:**

Questions: 5, 10  
Problems: 11, 18, 21, 27, 36, 37, 46, 50\*  
(\*plot the electric field)

**Chapter 24:**

Questions: 9  
Problems: 7, 17, 19, 25, 28, 30, 36, 45, 47\*, 55, 63  
(\*extra credit)

**Chapter 25:**

Questions: 9  
Problems: 9, 16, 24, 30, 35, 42, 51

**Chapter 26:**

Questions: 6  
Problems: 4, 13, 18, 24, 31, 48, 52

**Chapter 27:**

Questions: 10  
Problems: 8, 17, 23, 27, 31, 37, 49, 51, 60\*, 64  
(\*plot the charge across the capacitor as a function of time)

**Chapter 28:**

Questions: 2, 3  
Problems: 7, 14, 24, 31, 39, 48, 53\*, 55  
(\*extra credit)

**Chapter 29:**

Questions: 1, 5  
Problems: 6, 10, 12, 29, 36, 39, 44, 45, 47, 58

**Chapter 30:**

Questions: 7  
Problems: 11, 18, 31, 36, 40, 45, 56, 64

**Chapter 31:**

Questions: 8, 11  
Problems: 31, 32, 35, 37, 57, 63

**Chapter 32:**

Questions: 1, 2  
Problems: 3, 9, 18, 19, 35, 36, 37, 53

**Chapter 33:**

Questions: 9, 10  
Problems: 6, 9, 15, 19, 27, 34, 46, 53, 60, 69