

PHYS 114 – General Physics II – Spring 2009

KSU - 4 credits

<u>Section:</u>	<u>Instructor:</u>	<u>Contact Info.</u>
LEC: TU 1:30, CW103	Prof. Gary Wysin	CW309, 532-1628, wysin@phys.ksu.edu
QUIZ: M 5:30 - 6:45, CW101-103	Prof. Gary Wysin	Office hours: TU 2:30-4:20 & appt.
REC: W 2:30, 3:30	Prof. Gary Wysin	
REC: W 8:30, 9:30, 10:30	Prof. Robert Szoszkiewicz	CW307, 532-0855, rs@phys.ksu.edu
		Office hours: TU 4:30-6:30 & appt.
Director of Labs:	Dr. David Van Domelen	CW402, 532-1605, dvandom@phys.ksu.edu

Important!

You must register for all four PHYS 114 sections, LEC, QZ, REC, and LAB. If you are missing any of these, get on the wait list immediately!

Text

Physics: Principles with Applications (6th Ed.), Douglas C. Giancoli.

Course Web Sites

See lecture notes and other aids at www.phys.ksu.edu/personal/wysin/GPII/ .
See your current grades at online.ksu.edu .

Prerequisites

Phys 113, and a basic knowledge of algebra, trigonometry, geometry and a calculator.

Description

PHYS 114 is an algebra/trigonometry based introductory physics course dealing with the topics of electricity, magnetism, light and quantum physics. Emphasis will be placed on the basic principles and concepts and their applications in everyday life and in the world’s economy.

Objectives

Successful students will understand how to analyze the processes of nature, what goes on in the world, and how some technology works, including the basic concepts and numerical estimates.

Grading

Grades will be determined from Recitation, Exams, Labs, and Final Exam, as follows:

<u>Task</u>	<u>Points</u>	<u>Grading scale</u>
Recitation (best 12/15)	200	A: 1000–901
Lab writeups (best 12/13)	200	B: 900–801
Hour Exams (best 4/5)	400	C: 800–701
Comprehensive Final Exam	200	D: 700–601
Total	1000	F: below 601

Each recitation is worth 10 points; the best 12 will be scaled out of 200 points. Each lab writeup is worth 10 points; the best 12 will be scaled out of 200 points. The lowest of the 5 hour-exams, each worth 100 points, will be dropped. There are no makeup recitations, labs or exams. The comprehensive final exam includes all topics covered during the course. You must take the final exam at the scheduled time, 6:20 - 8:10 p.m., Tuesday, May 12, in CW 101, 102, 103. (See <http://courses.k-state.edu/spring2009/information/xam.htm>).

Laboratory

The laboratory is a required and integrated part of the course, and counts 20% towards your grade. *A passing grade (60%) in the laboratory is required to pass the course.* See the lab manual and listen to your lab instructor for rules and grading procedures. Lab begins during the **second week** of class. You must have a lab manual at the first lab. They are available at the Arts and Sciences copy center in the basement of Eisenhower Hall.

Credit for Previous Lab Work

Students retaking the course, who have successfully completed the lab must contact David Van Domelen in CW402 (532-1605) prior to the first week of lab to get credit for the previous lab work.

Recitation and Homework

Doing homework problems is an important part of obtaining success in physics, helping you organize your thoughts, **learn the concepts**, and **apply them**. There is homework assigned with each lecture, try to do it as soon as possible after the lecture, and not get behind!!! Especially make sure you know how to do the level I problems, which usually involve applying only a single concept. Also do as many of the level II problems as possible, which usually involve applying some combination of concepts.

In each recitation, either you will do a short quiz, or your instructor will collect one of the assigned homework questions/problems, for 10 points. If you do not have the requested homework, you can hand in one of the other assigned questions/problems for up to half credit. What you hand in should show the details of how you solved it: include necessary **diagrams**, the **equations** you applied, and show how the numbers with units were inserted after that, and finally, a numerical answer with the correct units. No credit will be given for just numbers or a yes/no response. It's a fact: Students who do best on exams are the ones who work HW carefully, write things out clearly, with well-organized presentation of **equations** used, before inserting numbers. See the problem solving tips on pages 3 and 4.

Hour Exams

These take place on Mondays at 5:30–6:45 p.m. in CW 101,102,103, see the schedule. The exam problems will be based on the same concepts as in the recitation homeworks. Try to study the **concepts** and **how to apply them**, *do not* just try to memorize how to solve *particular* problems.

You are allowed to bring a single 8.5×11 page of notes that you prepared. You can write anything you wish on the page, both sides. You must write this out by hand, so that you have to organize it and think about what is being written when you prepare it. You will not be given a separate equation sheet for the exams. Note that having this page is not a guarantee of success! Understanding how to **apply the concepts** will be the key to your success!!

Final Exam

You are allowed to bring up to three 8.5×11 pages of notes, on which you can write anything, as explained for the hour exams. As well, preparing these papers will be useful for preparing for the exam. The Final Exam includes all topics covered during the semester. It takes place Tuesday, May 12, from 6:20 – 8:10 p.m. in CW 101,102,103.

Tips on doing Physics II homework problems

* Don't wait until the last minute.

Begin homework assignments several days before they are due.
You can surely do some of them even before hearing about the topic in lecture.

* What's going on here?

Sketch the situation. Make it seem real for yourself.
Identify desired quantities, their symbols, and their units.
I want to find charge q , in coulombs
List the quantities you know, with units.
I know potential V , in volts.
I know capacitance C , in farads.
Recall the definitions of these items, it may help a lot!
What are the important equations or relations between them?
The charge is given by the capacitor formula. $q = CV$.

* Get help if you need it.

Being completely stuck is no fun. If you really are getting nowhere, and have no idea what to do next, you are encouraged to cooperate with other students, or seek help from your instructors.

* What's my strategy?

What concepts and equations apply?
Briefly state your strategy in words and sentences.
(Pretend you are explaining to another student.)
Write down the equation(s) you will use, in symbols.

* Solve algebraically for the desired quantity.

Still stuck? Did you really draw a diagram?!
You may need to combine some equations, or use trigonometry, that's OK!
Get the quantity you want on the left of the equals sign, and everything else on the right.
Don't skip steps.

* Do the arithmetic, with units.

Substitute numbers with units in your equation.
Power $P = IV$ becomes $P = (8.0 A)(24 V) = (8.0 C/s)(24 J/C) = 192 J/s = 192 W$.
Keep the units on everything until the end. It's a useful check.

* Write down the answer, with correct units!

* Does the answer make sense?

Is the number of reasonable size, not excessively large or small?
If you change the given numbers to very simple cases, will you get an expected result?
If you modified the situation into a simpler one, will your approach still work?

* Enjoy the challenge.

Hey, you figured out something new. Now you understand it.
And it wasn't so simple.
Have confidence, you can do as well or better on the next problem!

Physics Study Hints:

1. Read the textbook, paying attention to the equations and figures.
2. When you take notes in class, don't just copy equations and diagrams. Listen to the instructor and write down the *ideas* behind the equations and diagrams!
3. Study the examples in the book in order to learn how to solve problems.
4. If you don't understand, formulate a question. Write down your questions so you can ask your instructor later. Then ask your instructor later!
5. Stop occasionally and think about what you just read. Try to think of real-life examples where the physics ideas might be applicable.
6. Look at extra questions and level I problems, just to see if you would know how to answer them. If so, you have a good grasp of the definitions of basic concepts.
7. If you can't work a difficult homework problem, try to work a related, but easier one first. Or, try breaking your problem into steps or parts.
8. Keep in mind, the level II problems usually require you to apply more than one concept. You probably need to use more than one equation.
9. In physics, the same idea can be expressed several ways: as a picture or diagram, equation, or graph. Look for the main idea. Think about how the different presentations help you to understand it.
10. Remember, physics isn't always complicated. Most of the ideas are simple and common-sense.

Laboratory Hints:

1. Work smart, which is to say, efficiently. Check yourself as you go along (hints 3,5,6 above). Do it right the first time, because you won't have time to do it over.
2. Write down the names and telephone numbers of your lab partners on your data sheet.
3. Read the lab manual before lab. Figure out what you want to look for, and how you will look for it. Write this down before you get to lab. (This is the start of your lab report.)
4. In lab, pay attention to the lab instructor's explanation. Some things aren't in the lab manual.
5. While taking data, make a graph right away so you can see if your data make sense. Professional physicists do this all the time. Plot each data point as soon as you've finished writing down the number. This habit can save a lot of trouble later, because you can immediately see what the data are doing!
6. After you have taken a few data points, do a sample calculation for analyzing the data. This will (a) let you know if your data make sense, (b) let you know whether you understand what you are doing, (c) let you know if you've forgotten to write down any quantities. A sample calculation will save you from getting home, then realizing that you forgot to get a number.
7. Write down everything on your data sheets. Never rely on your memory. Use pen. Never erase. Cross mistakes out neatly instead, so you can still read them if you have to. Write down ideas that occur to members of your lab group, too!
8. Work as a team. Make sure that everyone gets to play with the equipment. Report broken equipment to the lab instructor, so he can make sure it gets fixed.
9. Graphs on the data sheet may be crude. Graphs in the lab report should be drawn large enough to see, preferably on a full page. Graphs and tables must have titles. The axes on graphs must have labels (i.e., numbers, name of quantity being plotted, and its units).
10. Use words and sentences to describe what you are doing. Correct spelling and grammar are encouraged. Graphs, tables and equations supplement the words. They never replace words.

Schedule for General Physics II, Spring 2009

<u>Date</u>	<u>Reading</u>	<u>Lec Topics / Rec. Homework Due</u>	<u>Week's Lab</u>
1-15 Th	16-1 to 16-6	16. Electric Charge & Force: Coulomb's Law	No Lab
1-20 Tu	16-6 to 16-9	16. Electric Field & Field Lines	Measurement Tools
1-21 We	Recitation 1	16. Q4,6; P3,9,12,16 16. Q17,18; P24,28,33,67	
1-22 Th	17-1 to 17-5	17. Electric Potential and Pot. Energy	
1-27 Tu	17-7 to 17-9	17. Capacitance: Storing Charge & Energy	Equipotentials & Electric Fields
1-28 We	Recitation 2	17. Q2,4,7; P2,5,8,15,21 17. Q8,14; P32,39,47,76	
1-29 Th	Review	Chs. 16 & 17	
2-02 Mo	Exam #1	Chs. 16 & 17	Thermal Coefficient of Resistivity
2-03 Tu	18-1 to 18-6	18. Current & Resistance: Ohm's Law	
2-04 We	Recitation 3	18. Q5,6,11; P2,6,11,13,29,36,58	
2-05 Th	19-1 to 19-4	19. DC Circuits & Kirchhoff's Rules	
2-10 Tu	20-1 to 20-6	20. Magnetic Field and Forces	Ohm's Law & DC Circuits
2-11 We	Recitation 4	19. Q4,5,6; P3,7,17,24,27,84 20. Q3,9,10; P5,11,17,26,28	
2-12 Th	20-6 to 20-10	20. Magnetic Applications (Solenoids...)	
2-17 Tu	21-1 to 21-5	21. Induced EMF (Faraday's Law)	Currents and Magnetic Fields
2-18 We	Recitation 5	20. Q15,30; P32,41,48,54,78 21. Q2,3,4; P4,5,9,10,15	
2-19 Th	Review	Chs. 18A, 19 & 20	
2-23 Mo	Exam #2	Chs. 18A, 19 & 20	Electromagnetic Induction
2-24 Tu	18-7, 21-6,7	18, 21. Alternating Current & Transformers	
2-25 We	Recitation 6	18. P43,46,48 21. Q13,15,19; P17,20,30,38	
2-26 Th	21-9 to 21-13	21. Inductors, Capacitors in AC Circuits	
3-03 Tu	21-13 & 14	21. AC Resonance and Oscillators	Generator
3-04 We	Recitation 7	21. Q20,22; P39,42,44,53,58,60 21. Q23,24; P61,62,65,69,70	
3-05 Th	22-1 to 22-7	22. Electromagnetic Waves	
3-10 Tu	23-1 to 23-3	23. Images by Reflection, Mirrors	AC Circuits
3-11 We	Recitation 8	22. Q1,3,7; P3,6,9,16,34,48 23. Q4,5,7; P1,5,7,10	
3-12 Th	Review	Chs. 18B, 21 & 22	

Schedule for General Physics II, Spring 2009 (continued)

<u>Date</u>	<u>Reading</u>	<u>Lec Topics / Rec. Homework Due</u>	<u>Week's Lab</u>
3-16 Mo	Spring Break	No Classes All Week	No Lab
3-23 Mo	Exam #3	Chs. 18B, 21 & 22	Ray Tracing
3-24 Tu	23-4 to 23-9	23. Images by Refraction, Lenses	
3-25 We	Recitation 9	23. Q11,13,19; P21,27,30,44,46,50,58	
3-26 Th	24-1 to 24-6	24. Light Waves & Interference	
3-31 Tu	24-8 to 24-10	24. Thin Film Interference; Polarization	Diffraction & Interference
4-01 We	Recitation 10	24. Q4,6,18; P3,11,18,22,27,30 24. Q26,30; P42,44,53,57	
4-02 Th	25-1 to 25-4	25. Optical Instruments & Vision	
4-07 Tu	27-1 to 27-9	27. Electrons, Photons, Matter Waves	Human Eye & Simple Camera
4-08 We	Recitation 11	25. Q1,6; P4,7,12,15,19,27 27. Q4,7,9; P6,11,16,18,20	
4-09 Th	Review	Chs. 23, 24 & 25	
4-13 Mo	Exam #4	Chs. 23, 24 & 25	Photoelectric Effect
4-14 Tu	27-10 to 27-13	27. Atomic Spectra & Bohr Model	
4-15 We	Recitation 12	27. Q12,13,15; P38,41,70,80 27. Q18,22; P48,51,55,76	
4-16 Th	28-1 to 28-4	28. Quantum Mechanics & Uncertainty	
4-21 Tu	28-5 to 28-8	28. Q.M. Rules for Atoms: Periodic Table	No Lab
4-22 We	Recitation 13	28. Q1,2,7; P3,4,7,10 28. Q17,19,20; P14,15,18,22,42	
4-23 Th	Review	Chs. 27 & 28	
4-27 Mo	Exam #5	Chs. 27 & 28	Simulated Nuclear Decay
4-28 Tu	30-1 to 30-6	30. Nuclear Physics & Radioactive Decays	
4-29 We	Recitation 14	30. Q1,2,3,11; P3,11,15,18,22,28	
4-30 Th	30-7 to 30-13	30. Half-Life, Decay Rates, Activity	
5-05 Tu	31-1 to 31-3	31. Nuclear Energy: Transmutation, Fission, Fusion	No Lab
5-06 We	Recitation 15	30. Q12,14,24; P37,38,41,52,56 31. Q1,4,22; P3,7,20,31,54	
5-07 Th	Review	Chs. 16-25, 27,28, 30,31	
5-12 Tu	Final Exam	Chs. 16-25, 27,28, 30,31, 6:20–8:10 p.m.	CW 101,102,103

IMPORTANT STATEMENTS

Disabilities

Any student with a disability that needs a classroom accommodation, access to technology or other assistance in this course should contact Disability Support Services and/or their instructor.

University Statement Regarding Academic Honesty

Kansas State University has an Honor System based on personal integrity, which is presumed to be sufficient assurance in academic matters one's work is performed honestly and without unauthorized assistance. Undergraduate and graduate students, by registration, acknowledge the jurisdiction of the Honor System. The policies and procedures of the Honor System apply to all full and part-time students enrolled in undergraduate and graduate courses on-campus, off-campus, and via distance learning. The honor system website can be reach via the following URL: www.ksu.edu/honor.

A component vital to the Honor System is the inclusion of the Honor Pledge which applies to all assignments, examinations, or other course work undertaken by students. The Honor Pledge is implied, whether or not it is stated: "On my honor, as a student, I have neither given nor received unauthorized aid on this academic work." A grade of XF can result from a breach of academic honesty. The F indicates failure in the course; the X indicates the reason is an Honor Pledge violation.

My Additional Statements on Academic Honesty

Note that you are permitted to work with (not copy from!) other students on homework problems (and labs) if you acknowledge cooperation by writing "I worked with (name)" on the assignment. Use of a solution manual for doing homework is an unauthorized aid. The recitation quizzes and all exams must be entirely your own work.

University Statement Defining Expectations for Classroom Conduct

All student activities in the University, including this course, are governed by the Student Judicial Conduct Code as outlined in the Student Government Association By Laws, Article VI, Section 3, number 2. Students that engage in behavior that disrupts the learning environment may be asked to leave the class.

University Campus Safety Statement

Kansas State University is committed to providing a safe teaching and learning environment for student and faculty members. In order to enhance your safety in the unlikely case of a campus emergency make sure that you know where and how to quickly exit your classroom and how to follow any emergency directives. To view additional campus emergency information go to the University's main page, www.k-state.edu, and click on the Emergency Information button.

Copyright Statement

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Using your i>clicker in class

You are encouraged to purchase an i>clicker remote (through the bookstore) for in-class participation and voting for EXTRA CREDIT.

Please bring your text and clicker to each class.

i>clicker is a response system that enables you to respond to questions I pose during class. You will be graded on that feedback and/or your in-class participation during Lecture.

In order to receive this credit, you need to register your i>clicker remote by **Feb. 1**. You must have come to class at least once and voted on at least one question, in order to complete this registration properly.

FOR WEB REGISTRATION, once you have voted on a question in my class:

1. Go to www.iclicker.com/registration.
2. Complete the fields with your first name, last name, **student ID**, and remote ID.
 - a. Your student ID should be your **KSU wID (wildcat ID)**.
 - b. Your i>clicker remote ID is found on the bottom of the back of your i>clicker remote.

You will receive 1 point per class for participation/attendance and additional performance points for correct answers to multiple-choice questions that illustrate that day's concepts. I might ask questions on that day's reading or on ideas introduced in that day's lecture. Periodically I will copy the total extra credit points over to your K-State Online gradebook.

Questions? Need help?

Contact us at support@iclicker.com or by phone at 866-209-5698.

i>clicker