PHYS 113 – General Physics I – Fall 2007 **KSU - 4 credits**

Section:	Instructor:	Contact Info.
LEC: MW 8:30 & 9:30, CW103	Gary Wysin	CW309, 532-1628, wysin@phys.ksu.edu
QUIZ: W 5:30 - 6:45, CW101-103	Gary Wysin	Office hours: MTW 10:30-11:20 & appt.
REC: T 8:30 & 9:30	Gary Wysin	
REC: T 2:30 & 3:30	Itzik Ben-Itzhak	CW328, 532-1636, ibi@phys.ksu.edu
REC: T 11:30 & 1:30	Vinod Kumarappan	CW016, 532-1632, vinod@phys.ksu.edu
Director of Labs:	David Van Domelen	CW402, 532-1605, dvandom@phys.ksu.edu

Important!
You must register for all four PHYS 113 sections, LEC, QZ, REC, and LAB. If you are missing any of these, get on the wait list immediately!

Text
Physics: Principles with Applications (6^{th} Ed.), Douglas C. Giancoli.

Course Web Sites
See lecture notes and other aids at www.phys.ksu.edu/personal/wysin/GPI/ .
See your current grades at online.ksu.edu .

Prerequisites
A basic knowledge of algebra, trigonometry, geometry and a calculator.

Description
PHYS 113 is an algebra/trigonometry based introductory physics course dealing with the topics of motion, mechanics, matter and energy. Emphasis will be placed on the basic principles and concepts and their applications in everyday life.

Objectives
Successfull students will obtain a broad idea of how to analyze the processes of nature, what goes on in the world, and how some technology works, including the basic concepts and how to make numerical estimates of interesting quantities. Also to learn critical analysis of real-life situations!

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

Task	Points	Grading scale
Homeworks/quizzes (REC, best 12/16)	200	A: 1000–901
Lab writeups (LAB, best 12/13)	200	B: 900–801
Hour Exams (QUIZ, best 4/5)	400	C: 800–701
Comprehensive Final Exam	200	D: 700–601
Total	1000	F: below 601

During the term, there are 16 recitations, 5 "hour exams," and a final exam, covering the first half of the Giancoli text. The schedule is given on the final pages of this syllabus. Mark your calendar now and avoid the surprise!

Each of the 16 recitation grades 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 hour exams, each worth 100 points, will be dropped. Because lowest scores are dropped, there are no makeup recitations, labs, or exams. The comprehensive final exam includes all topics covered during the course, and must be taken at the scheduled time, 7:00 - 8:50 p.m., Tuesday, Dec. 11, in CW101, 102 & 103.

Laboratory
The laboratory is a required and integrated part of the course, and counts 20% towards your grade. *A passing grade in the laboratory is required to pass the course.* See the lab manual and listen to your lab instructor for rules and grading procedures. Labs begins during the **first 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) during 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 are homework problems assigned with each lecture, try to do them 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 day of recitation, your instructor will give you a grade based either on your homework or a short in-class quiz, for a total of 10 points. What you hand in should show the details of how you solved the problems: include necessary diagrams, the equations you applied, show how the numbers with units were inserted after that, and finally, a numerical answer with the correct units. No credit will be given if just the final numerical answer is given. See the problem-solving-tips on pages 3 and 4.

Wednesday Hour Exams
These take place on Wednesdays 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 covered in the 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 $\times$ 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. 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 $\times$ 11 pages of notes, on which you can write anything, as explained for the Wednesday 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.

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 & Integrity 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 & Integrity System. The policies and procedures of the Honor & Integrity 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 web site can be reach via the following URL: `http://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
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 ...," 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.

Tips on doing 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, with their units.
I want to find distance, in meters
List the quantities you know, with units.
I know velocity, in meters/sec.
Recall the definitions of these items, it may help a lot!
What are the important equations or relations between them?
Velocity times time equals distance. $x = vt$.

* **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.**

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.
$x = vt$ becomes $x = (5.0\ m/s)(2.0\ s) = 10\ m$.
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 occasionaly 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, an equation, or a 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 of the simple, common-sense type.

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. Grpahs 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 I, Fall 2007

Date	Reading	Lec. Topics / Rec. Homework Due on Date Shown	Labs & Exams
8-20 Mo	1-1 to 1-8	Ch. 1 – Science, Measurements, Units, Numbers	
8-21 Tu	Rec. 1	Ch. 1 — **Q**3,7; **P**5,12,20,26,37,38,46,48	Intro. to Lab
8-22 We	2-1 to 2-4	Ch. 2 – 1-Dimensional Kinematics, Velocity, Acceleration	
8-27 Mo	2-5 to 2-7	Ch. 2 – Motion with Constant Acceleration; Free Fall	
8-28 Tu	Rec. 2	Ch. 2 — **Q**7,11; **P**2,4,7,16,18	Velocity &
		Ch. 2 — **Q**17,19; **P**21,24,27,35,39,69	Acceleration
8-29 We	3-1 to 3-4	Ch. 3 –Vectors: Addition, Subtraction, Components	
9-03 Mo	no class	Labor Day Holiday	
9-04 Tu	Rec. 3	Ch. 3 — **Q**2,7; **P**2,6,8,10,11,37,55,58	Galileo's
9-05 We	3-5 to 3-8	Ch. 3 – 2-Dimensional Motion, Projectiles; Relative Motion	Inclined Plane
9-10 Mo	4-1 to 4-6	Ch. 4 – Newton's Laws of Motion; Gravity in Problems	
9-11 Tu	Rec. 4	Ch. 3 — **Q**16,18; **P**19,21,24,27,31	Vectors & Forces
		Ch. 4 — **Q**3,9; **P**4,5,8,12,23,30	
9-12 We	4-7 to 4-9	Ch. 4 – Applying Newton's Laws; Friction; Inclines	**Exam 1, Chs. 1–3**
9-17 Mo	5-1 to 5-5	Ch. 5 – Circular Motion and Centripetal Acceleration	
9-18 Tu	Rec. 5	Ch. 4 — **Q**14,21; **P**25,29,37,44,52	
		Ch. 5 — **Q**1,3; **P**2,5,11,18,21,25	Newton's 2nd Law
9-19 We	5-6 to 5-9	Ch. 5 – Newton's Law of Gravitation, Orbits	
9-24 Mo	6-1 to 6-5	Ch. 6 – Work, Kinetic and Potential Energy	
9-25 Tu	Rec. 6	Ch. 5 — **Q**20,21; **P**28,34,43,46,77	Centripetal
		Ch. 6 — **Q**5,16; **P**3,8,18,22,27,31	Acceleration
9-26 We	6-6 to 6-10	Ch. 6 – Conservation of Mechanical Energy	
10-01 Mo	no class	Fall Break Holiday	
10-02 Tu	Rec. 7	Ch. 6 — **Q**8,18; **P**34,38,42,43,51,55,60,62	Work & Energy
10-03 We	7-1 to 7-5	Ch. 7 – Linear Momentum and 1D Collisions	**Exam 2, Chs. 4,5**
10-08 Mo	7-6 to 7-10	Ch. 7 – More on Collisions; Center of Mass	
10-09 Tu	Rec. 8	Ch. 7 — **Q**1,5; **P**4,7,15,19,22,65	Linear Momentum
		Ch. 7 — **Q**13,15; **P**31,34,41,46,70	
10-10 We	8-1 to 8-4	Ch. 8 – Rotation: Kinematics, Torque	

Continued on next page.

Schedule for General Physics I, Fall 2007 (continued)

Date	Reading	Lec. Topics / Rec. Homework Due on Date Shown	Labs & Exams
10-15 Mo	8-5 to 8-8	Ch. 8 – Rotation: Dynamics, Inertia, Angular Momentum	
10-16 Tu	Rec. 9	Ch. 8 — **Q**2,4; **P**4,8,11,19,25,26	Angular Momentum
		Ch. 8 — **Q**13,19; **P**27,37,45,55,62	
10-17 We	10-1 to 10-6	Ch. 10 – Static Fluids: Density and Pressure	
10-22 Mo	10-7 to 10-10	Ch. 10 – Bouyant Forces, Bernouli & Moving Fluids	
10-23 Tu	Rec. 10	Ch. 10 — **Q**3,7; **P**3,6,8,10,15,18	
		Ch. 10 — **Q**9,16; **P**63,22,29,33,40,45	Density & Buoyancy
10-24 We	10-11 to 10-13	Ch. 10 – Fluid Viscosity & Surface Tension	**Exam 3, Chs. 6–8**
10-29 Mo	11-1 to 11-4	Ch. 11 – Vibrations; Simple Harmonic Motion	
10-30 Tu	Rec. 11	Ch. 10 — **Q**17,19; **P**41,51,53,56	Simple Pendulum
		Ch. 11 — **Q**1,10; **P**3,10,16,24,29,32	
10-31 We	11-5 to 11-10	Ch. 11 – Waves: Frequency, Wavelength, Speed	
11-05 Mo	11-11 to 11-13	Ch. 11 – Waves: Interference, Standing Waves	
11-06 Tu	Rec. 12	Ch. 11 — **Q**12,13; **P**37,38,41,45,46	Vibrating Strings
		Ch. 11 — **Q**20,21; **P**53,55,59,61,77	
11-07 We	12-1 to 12-4	Ch. 12 – Sound, Intensity and Level; Sources	
11-12 Mo	13-1 to 13-8	Ch. 13 – Atomic Theory, Temperature, Ideal Gas Law	
11-13 Tu	Rec. 13	Ch. 12 — **Q**1,4; **P**3,4,9,14,24,26,30,36	No Lab
		Ch. 13 — **Q**1,5; **P**4,26,28,29,32	
11-14 We	13-8 to 13-11	Ch. 13 – Ideal Gases and Kinetic Theory	**Exam 4, Chs. 10–12**
11-19 Mo	14-1 to 14-5	Ch. 14 – Heat: Temperature Changes, Latent Heat	
11-20 Tu	Rec. 14	Ch. 13 — **Q**16,20; **P**35,49,54,85	
		Ch. 14 — **Q**2,7; **P**2,7,9,22,31	No Lab
11-21 We	no class	Thanksgiving Holiday	
11-26 Mo	14-6 to 14-8	Ch. 14 – Heat: Conduction, Convection, Radiation	
11-27 Tu	Rec. 15	Ch. 14 — **Q**11,19; **P**18,33,35,38,40,41,50	Latent Heat of LN2
11-28 We	15-1 to 15-3	Ch. 15 – Thermodynamics, 1st Law, Energy Conservation	**Exam 5, Chs. 13,14**
12-03 Mo	15-4 to 15-6	Ch. 15 – Thermodynamics, 2nd Law, Engines & Cooling	
12-04 Tu	Rec. 16	Ch. 15 — **Q**1,5; **P**1,4,6,9,16,18	
		Ch. 15 — **Q**11,14; **P**21,25,31,32,59	No Lab
12-05 We	Ch. Summaries	Tips on Semester Review	
12-11 Tu	Chs.1–8,10–15	**Final Exam**, 7:00–8:50 p.m., CW101,102,103	