

# PHYSICS 152 — COLLEGE PHYSICS II

## UH MANOA — Spring Semester 2012

### Course Information & Policies

#### Lecture

MWF 9:30–10:20 a.m.  
Physical Science Building (“PSB” or “PhySci”), Rm. 217

#### Instructor

Mr. Michael Nassir

E-mail: [nassir@hawaii.edu](mailto:nassir@hawaii.edu)

Course Web page: <http://www.phys.hawaii.edu/~nassir/phys152/>

Office: Watanabe Hall, Rm. 426, (808) 956-2922 (office hours by appointment)

- Help Sessions:
- Wednesday afternoons — *time & location to be announced*
  - Thursday afternoons — *time & location to be announced*

- Individual Assistance:
- Physics TA tutoring — approx. 20 hrs/week in Watanabe 421
  - Natural Sciences Learning Emporium Physics tutoring — approx. 20 hrs/week in Bilger Addition 209
  - Learning Assistance Center tutoring — by appointment in Sinclair Library

**Required Materials** TEXTBOOK: Young, Hugh D., *College Physics*, 9<sup>th</sup> ed. (2012), Volume 2 only (Chaps. 17–30)

- The UH Bookstore offers various options: volume 2 only in paperback (\$142); full text in hardcover (\$227), or full text in “looseleaf” (\$160). All of these should be “bundled” with a *Mastering Physics* access code and iClicker rebate coupon. *Note: Looseleaf is cheapest, but cannot be sold back to the UH Bookstore.*
- “eText” (Web-based) access to the text is automatically available (for 18 months) through *Mastering Physics*

ONLINE HOMEWORK ACCESS: *Mastering Physics* website — requires access code (valid for 18 months) either using Access Kit or via online purchase (\$56 for *MP* only, \$101 including “eText”): <http://www.masteringphysics.com>

SCIENTIFIC CALCULATOR with scientific notation, trig functions, exponents, & logarithms — bring to lab & exams (necessary!) and lectures (needed for occasional in-class questions). *Graphing or programmable calculators are allowed, but are NOT necessary.*

iCLICKER: (\$40 new, \$30 used at UH Bookstore)

- This is the same original (old-style) 5-button iClicker that is commonly used in other UH classes. You do *not* need the new “iClicker 2.”
- Used iClickers are fine.
- “Web-clicker” will not be available in this class.
- Please register your clicker *in class* during the first two weeks, or by contacting me after that. We will NOT be using registration through UH Laulima or via [www.iclicker.com](http://www.iclicker.com).

#### Optional Books

Newman, Forrest, *Student Solutions Manual for Young College Physics 9<sup>th</sup> ed.*, (2012) paperback (\$82 new at UH Bookstore)

Gonick & Huffman, *The Cartoon Guide to Physics* (1990) paperback (\$18 new, \$14 used at UH Bookstore)

## **Course Description**

This course continues a two-semester introduction to the fundamentals of physics begun in Physics 151, and will cover electricity, magnetism, optics, special relativity, and atomic & nuclear physics. Lectures and problem-solving will regularly use the mathematical tools of algebra, geometry, trigonometry, and vectors, but *not* calculus.

### ***Prerequisites:***

- A grade of “C” or better in **PHYS 151**
- A grade of “C” or better in **MATH 140 (trigonometry & pre-calculus) or MATH 215 or higher**; or instead, a passing score on the Mathematics Department’s Math Placement Exam ( $\geq 14$  on Part I &  $\geq 10$  on Part II).

**Lab:** If you also need to take PHYS 152L lab, it is strongly recommended that you do so concurrently with the lecture; the lab provides a hands-on way of reinforcing and complementing many of the topics presented in lecture. However, concurrent enrollment in PHYS 152L lab is *not* mandatory for all students in PHYS 152 lecture.

## **Grading & Course Work**

- **Final grades** will be computed on a **curve** (to be decided), based on your **overall course percentage** relative to the other students in the class. Your overall course percentage will be computed as follows:

<b>iClicker In-Class Questions</b>	<b>3%</b>
<b>Homework (Paper + Online)</b>	<b>24%</b>
<b>Midterm Exams #1 &amp; #2</b>	<b>18% each</b>
<b>Take-home Midterm Exam #3</b>	<b>7%</b>
<b>Final Exam</b>	<b>30%</b>

After each major exam, I will post online grade sheets (listed by your “roster numbers,” not names) displaying all of your scores, and I will provide a histogram showing the relative scores of everyone in the class. I urge you to double-check your scores on my grade sheets, as well as the score tallies on your individual papers. While I apologize in advance for any errors, they may well happen with such a large class — please help me to correct them. Final exam scores and final grades will be posted online (and grades will appear in MyUH) shortly after the term ends.

- **iClicker Questions** will be asked during many lectures. Partial credit (1 point) will be given for any response at all (i.e., credit for “participation”); full credit (3 points) will be given for a correct response.

- **Paper Homework** sheets will usually be due on Fridays in lecture (with some exceptions due to holidays or exams), and will be graded either by our class grader or by me; please see me outside of class with any questions about grading. **Late paper homework** will **NOT** be accepted *for any reason after solutions* for that assignment have been posted online, shortly after lecture on the due date. All paper homework assignments will be worth the same number of points, and your **TWO lowest paper homework scores** will be **dropped**.

- **Online Mastering Physics Homework** will usually be due on Mondays and will be graded automatically on the *Mastering Physics* website. Your scores likewise will be reported to me automatically. **Late online homework** is allowed, at a penalty of  $-5\%$  per day (prorated by fraction of a day). Details on how to log in at <http://www.masteringphysics.com> will be provided in a separate handout.

- Three **Midterm Exams** will test you on material from each month of the course. Roughly half of the **Final Exam** will cumulatively review all of this material, while the other half of the final exam will test new material from the last month of the course. The first two midterm exams will be 50 minutes long (given during regular class periods), and the third midterm will be take-home (open book) with no time limit:

Midterm #1	Friday, <b>February 3</b>	Chaps. 17–19
Midterm #2	Friday, <b>March 2</b>	Chaps. 20–22
Midterm #3	out Monday, <b>April 9</b> , due Friday, <b>April 13</b> (dates to be confirmed)	Chaps. 23–26
Final Exam	Monday, <b>May 7, 9:45–11:45 a.m.</b>	Chaps. 27–30 & cumulative review

You are allowed to bring 1 sheet of **handwritten notes** (no printouts or photocopies) to the first and second midterms, and 2 sheets to the final exam. However, do NOT let your “cheat sheet” become a substitute for learning formulas and practicing problems! (Graduate school exams, like the MCAT or GRE, do NOT allow open notes — you must memorize your formulas.) You will be allowed to retain your “cheat sheets” after each exam to build upon for later exams. *You must take all midterms and the final exam to avoid a failing grade in the course.*

- **Reading assignments** will be assigned on my course website. The listed reading assignments are the specific sections of the text that will be covered in lecture and that you will be responsible to know for exams. Short

tutorials with interactive applets and audio & video clips are available through the “Study Area” inside *Mastering Physics*, or you can visit them directly (for free) at: [http://wps.aw.com/aw\\_young\\_collegephysics\\_9\\_msa/](http://wps.aw.com/aw_young_collegephysics_9_msa/)

### **Solving Physics Problems**

- You will need a **calculator** with **scientific functions** (trigonometric & exponential/logarithmic functions, and power-of-10 notation) for homework AND EXAMS. (Graphing calculators are not necessary.)

- On all assignments and exams that call for free-response answers, you must **SHOW YOUR WORK**. Writing only the correct final answer without showing your steps is *not* acceptable and will result in little or no credit. It is a central notion in science to show your method along with your results, so that others can follow your reasoning and can question any steps or assumptions. Also, clear and complete explanations will only help you later when you review your own work and study for exams. It is never possible to “show too much work,” but it is easy not to show enough!

Always display your major mathematical steps from your initial formula(s) to your final answer, and annotate your reasoning with sketches and verbal explanations where appropriate. Mathematical steps should read sequentially and logically. Final answers must include **UNITS** and use an appropriate number of **SIGNIFICANT FIGURES**, and sometimes should be written in **SCIENTIFIC NOTATION**. To receive full credit, your answers to **free-response problems** MUST contain the following:

1. **initial formula**, followed by major algebraic rearrangement steps (if necessary)
2. **substitution** (“plugging in” known values), followed by major calculation steps (if necessary)
3. **final answer**, underlined or boxed, with proper **units**, **sci. notation** (if needed), & **significant figures**
4. additional **diagrams** or **comments**, as needed to define quantities (...a picture is worth  $10^3$  words!)

- **Organization** and **neatness** matter! Both should result naturally if you follow the above format. Disorganized or illegible work will be penalized.

- Please do NOT use **red ink** on any assignments or exams — we reserve that color for grading.

### **Collaboration**

Working in pairs or groups is common in science, and indeed is encouraged: teamwork can help you to make more efficient measurements and to catch errors, and explaining something to another person is a great way to learn it yourself. However, if you are working with a classmate while completing a physics assignment (or while making measurements in lab), there are a few guidelines to follow:

(1) You are strongly encouraged **first to attempt each homework problem YOURSELF, individually** (or, in lab, to make some of your lab measurements yourself). That way, you will get the educational value and the experience that comes from working the problem (or using the equipment) and “seeing for yourself.” Then, after you have tried first on your own, you can compare your answer (or lab results) to others’ work as a “sanity check.”

*On homework:* If you are stuck on a homework problem, you should seek just enough help to get unstuck. It is unwise to let someone simply feed you the entire solution, since you lose the educational value of working through the problem on your own. If necessary, try changing the numerical values in the problem and attempting it again by yourself, to ensure that you understand completely how to do the problem if you were to encounter it again on your own... say, on an exam.

*In lab:* If your results differ from other students’ results by only a bit, then *you should keep your own results* — most scientific measurements vary slightly due to “random error” (this will be discussed in lab), so you should *not* change yours to match your classmates’ results exactly. After all, how do you know which result is “correct,” yours or your classmates’? Record what *you* see or measure. (If your results differ *wildly*, then it is appropriate to try to figure out “what went wrong.” Small variations, however, are common and are a natural part of the random error inherent in making measurements.)

(2) All free-response solutions on all submitted assignments should ultimately be **in your own words**, reflecting **your own understanding** of the problems. You should plug numbers into your calculator and attempt (or re-attempt) all calculations *yourself*, even if you received assistance from others along the way.

Any passages or calculations that are **directly copied or plagiarized** from another student (or portions lifted from any other uncited source) will be given a score of **zero**. Again, your submitted work should reflect *your own understanding* of the problems.

*In lab:* If you make measurements together with a lab partner, make a note in your lab report of who your lab partner was for any particular experiment. Then, be sure that your calculations and the written passages of your lab reports are *in your own words*, even if your initial data or measurements are identical to your partner's.

(3) During **in-class exams**, **NO collaboration** of any sort is allowed; exams must be *entirely your own work*. Exams copied from another student, even partially, will be given a score of **zero**. Cases of cheating or plagiarism may be referred to the Office of Judicial Affairs for disciplinary review.

### **Getting Help**

- **Regularly-scheduled help sessions** (solving homework problems, answering questions, etc.) will be held every Wednesday & Thursday afternoon.

- The **Physics Learning Center in Watanabe 421** is open whenever Watanabe Hall is open, for all students to use to study (alone or together) on physics homework. There are tables, sofas, blackboards, etc., available for your use.

All Physics lab TAs schedule their two weekly office hours in Watanabe 421 as **tutoring hours** — FREE help with any physics homework problems or other physics questions (although lab TAs will give first priority to their own students with lab-related questions). Go to Wat 421 and check the posted schedule for tutoring times.

- The **Natural Sciences Learning Emporium** in Bilger Addition 209 is open M-F, 8am-5pm, for all students to seek help with lower-division math or science classes, or just to use the group study tables to work together. Schedule of tutors for physics and all other subjects are posted on the door to BilA 209 and online:

<http://www.hawaii.edu/natsci/academic/emporium>

- The **Learning Assistance Center** in Sinclair Library offers free, one-on-one tutoring for PHYS 152 and many other large math & science courses. Appointments are made online, at least 24 hours in advance:

<http://manoa.hawaii.edu/learning/tutoring.html>

- You may also drop by to see me in **my office, Watanabe 426**, during afternoons at times other than the regularly scheduled help sessions. I suggest that you call first (956-2922) to make sure that I am in. Please forgive me if I happen to be busy and ask you to return at another time. You may also make an appointment with me if you wish.

- The Department of Physics & Astronomy Office (Watanabe 416) maintains a list of grad students and others who are available for hire as **private tutors** — please stop by Wat 416 and ask the Department secretary for a copy of the list.

### **Lecture Notes**

- **Electronic scans** of my overhead transparencies during the semester may be made available on the Web as **PDF files** — to be decided. I will try to update the notes roughly once a week, and I will create a link to each scanned lecture from the PHYS 152 Syllabus webpage as the PDFs become available. Most Web browsers can automatically display and print PDF files, or you can download a free PDF viewer like Adobe's *Acrobat Reader* or Apple's *Preview*.

### **Extra Handouts**

**Extra copies of all handouts** from the one or two previous lectures will be brought to every lecture and help session. Almost all handouts will be available shortly after lecture as PDF files, and will be linked from the course Syllabus page — you can download them anytime.

### **Graded Papers**

**Graded papers** will be circulated in lecture once they are graded. Any papers that are not picked up in lecture will be left in the **wooden cubby boxes outside the rear of our lecture hall, PSB 217**. Look for "PHYS 152 Spring 2012," and find the box for your roster number. Please leave the boxes tidy and organized for your classmates' benefit.