

**TIME (for lectures):** M, W, and F 9:35 PM – 10:30 PM.

**Room:** 2009 Science Hall

**TEXT:** PHYSICS 2<sup>nd</sup> ed. by Giambattista, Richardson and Richardson, McGraw-Hill.

**INSTRUCTOR:** Takeshi Sakamoto, Assistant Professor

**TELEPHONE:** 313-577-2970

**E-MAIL:** Sakamoto@wayne.edu (Please put “PHY2140” in subject line)

**COURSE WEB PAGE:** WSU Blackboard

**OFFICE HOURS:** M 10:45 PM – 11:30 AM  
W: 10:45 PM – 11:30 AM,  
**Room 287**, Physics Research Building.

**LABORATORY:** PHY 2141 is the laboratory portion of PHY 2140. It is a co-requisite and, thus, is mandatory for you to be enrolled in both courses concurrently. However, laboratory is treated as a separate part of the course with its own grades and procedures which will be explained by your laboratory instructor. The experiments provide tangible demonstration and reinforcement of the ideas presented in this course. In addition, the laboratory is meant to show the importance of experiments in science. Your Laboratory Manual is to be purchased separately at the University Bookstore. For further details please inquire with Dr. Scott Payson at 313-577-3280. **Lab sections of PHY 2141 will not meet during the first two weeks. Labs will begin the week of September 13<sup>th</sup>.**

**QUIZ SECTIONS:** Quiz sections meet once per week to provide you with an opportunity to ask questions, discuss lecture material, and work through assigned practice problems. Assigned practice problems will be posted chapter by chapter on Blackboard as the course progresses and may also be available through WebAssign (in addition to the for-credit problems). These practice problems are intended to test your understanding of the course material and help prepare you for quizzes and exams. It is important that you solve these problems to solidify your mastery of the material. The quiz instructors will solve some of the sample problems each week, but there may not be enough time to cover each and every assigned problem in quiz section. In these quiz sections you will periodically be given a short quiz on material covered in lecture the previous week. There will be seven quizzes given during the semester, during the weeks indicated by asterisks. The scores on your six best quizzes will be used to calculate your quiz section grade, which contributes 60 points to the overall grade for the course. There will be no make-up quizzes offered.

Quiz Sections	CRN	Instructor	Room
Tuesday 9:35 AM ~10:30AM	22980	J Mlynarz	Physics Building 0185
Monday 10:40 AM ~ 11:35AM	22983	J Mlynarz	Alex Manoogian Hall 0037
Wednesday 10:40 AM ~ 11:35PM	22984	J Mlynarz	Alex Manoogian Hall 0043

**EXAMS:** There will be three 50 minute in class exams during the semester, as indicated on the course schedule. These exams will consist of multiple choice questions, including both conceptual and computational problems, and may have one or two long answer (free response) problems. Each exam will contribute 100 points towards your final grade in the course. You will be provided with a formula sheet prior to these exams. **There will be no make-up exams offered.** The final exam will incorporate both multiple choice and long answer/partial credit problems. You must bring your Wayne State ID to the exam and be prepared to present it to a proctor if asked during the exam. A group photograph of the class will be taken during each exam. No electronic devices other than a calculator are allowed at any time during the exams. **The use of any electronic device other than a calculator, including, but not limited to, cellular telephones, music players, or tablet computers, during the exam will be considered as academic misconduct resulting in immediate sanction. No graphing calculators are allowed.** More information on academic integrity can be found in a document prepared by the Office of Teaching and Learning, which can be downloaded from:

<http://www.otl.wayne.edu/pdf/AIB07Print.pdf>.

**ONLINE HOMEWORK:** The WebAssign online testing system (<http://webassign.net>) provides online homework submission and grading. The weekly homework assignments completed through WebAssign will contribute 20 points to your final grade in the course. If you buy the textbook in the campus store, it should include a WebAssign access card valid for two semesters. Access codes can also be purchased separately. More information is available on the WebAssign website. You should already be enrolled for the course in WebAssign with your **username and initial password** set to your six character WSU ID (e.g. “ab1234”) unless you already had a WebAssign account. In this case, your login and password may be your six character WSU ID plus “.1” (e.g. “ab1234.1”). *The password for existing accounts was not changed.* You should change your password after you first login. Additional information is available in your WebAssign Student Guide.

**PARTICIPATION:** Short (single-question) quizzes will be interspersed throughout the lectures to gauge your mastery of the material.

**GRADING:** Your course grade will be determined by your performance in the three in class exams, the online homework, the quiz section grade, classroom participation, and a final exam. The final exam will cover the material presented during the entire semester and contribute 200 points towards your final grade in the course. The same policies and procedures for the in-class exams will also apply for the final exam. The final exam will include one long-answer problem. Students in all PHY2140 sections will take the same final exam at the same time during the final exam period. The overall course grade will be determined on the basis of the following distribution:

Three in 50 min Mid-exams (100 points each)	300 points
Quizzes (best 6 of 7) + Attendance in quiz section	60 points (60 + 10)
Final Exam	200 points
WebAssign Homework	20 points
Classroom Participation (attendance plus questions)	20 points
Extra credit for attending a WSU Planetarium session	3 points
Extra credit for Vaden Miles attendance	3 points
Extra credit for a homework	4 points
<b>Total 610 points</b>	

Points accumulated	Percent	Grade
540-600	91-100	A
510-539	85-90	A-
480-509	80-84	B+
450-479	75-79	B
420-449	70-74	B-
390-419	65-69	C+
360-389	60-64	C
330-359	55-59	C-
300-329	50-54	D+
270-299	45-49	D
240-269	40-44	D-
0-239	0-39	F

**ADDITIONAL RESOURCES:** Additional help and support for this course is available in the *Physics Resource Center*, in room 172 Physics Building. This will open a few weeks after the beginning of the semester. In addition, both your quiz instructor and I will have regular office hours where we will be available to discuss any difficulties you may have with the course material.

**WITHDRAWAL DEADLINE:** The deadline to withdraw from the course will be **Friday, January 18th, 2013**. **Any course withdrawal request on Pipeline after this date will be automatically denied.**

**ACADEMIC INTEGRITY:** All forms of academic dishonesty are forbidden in this class. Specific examples of academic dishonesty include cheating during exams as well as changing test answers for re-grading. Continuing to write after the exam time is up will result in the grade of zero for that exam. All forms of academic dishonesty will be prosecuted to the fullest extent as outlined in the Wayne State University Student Code of Conduct, which can be downloaded from the University website.

**STUDENT DISABILITY SERVICES:** If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department.

SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University. Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.

**TENTATIVE CLASS SCHEDULE** (Subject to change; \* indicates weeks in which quizzes will be given in quiz section)

Week	Date	Day	Lecture Topic	Reading Assignment
1	01/07	M	Syllabus, Electric charge, Coulomb's Law,	16.1 - 16.3
	01/09	W	Electric fields, Motion of a point charge	16.4, 16.5
	01/11	F	Conductors in Electrostatic Equilibrium, Gauss's Law	16.6, 16.7
2	01/14	M	Electric potential and Potential energy	17.1, 17.2
	01/16	W	Electric Field, Electric Potential, and Capacitors	17.3 – 17.5
	01/18	F	Dielectrics and Energy Stored in a Capacitors	17.6 – 17.7
3	1/21	M	No class (Holiday)	
	01/23	W	Electric Current, Current, and Resistance	18.1 – 18.4 (no 18.3)
	01/25	F	Kirchhoff's Rules. Series and Parallel Circuits, Power	18.5 – 18.7
4	01/28	M	DC Circuits Analysis and Power & Energy in Circuits, Voltages, and RC circuits	18.8–18.10
	01/30	W	Magnetic Fields And Forces	19.1 – 19.4
	02/01	F	Review: Chapter 16 - 18	
5	02/04	M	Mid-Exam-1 (Chapter 16 – 18)	
	02/06	W	Applications of Magnetic Forces, Torque	19.5 – 19.7
	02/08	F	Magnetic field due to current, Magnetic Materials	19.8 – 19.9
6	02/11	M	Motional EMF, Faraday's Law, Lenz's Law	20.1 – 20.3
	02/13	W	Lenz's law, Applications, and LC circuits	20.4, 20.9, 20.10
	02/15	F	AC circuit	21.1 – 21.3
7	02/18	M	RLC Series Circuits	21.4, 21.5
	02/20	W	Maxwell's equations, E&M waves	22.1 – 22.3
	02/22	F	Energy Transport, Polarization, Doppler Shift	22.4 – 22.6
8	02/25	M	Maxwell's equations, E&M waves	22.7 – 22.8
	02/27	W	Light, Reflection, Refraction of light, and Total Internal Reflection	23.1 – 23.4
	03/01	F	Review for Mid-Exam-2 (Chapter 19 – 22)	
9	03/04	M	Mid-exam-2 (Chapter 19 – 22)	
	03/06	W	Polarization, Mirrors and Lenses	23.5 – 23.8
	03/08	F	Thin Lenses (23.9) and Interference (25.1)	23.9, 25.1
10	03/18	M	The Michelson interferometer and thin films	25.2 – 25.3
	03/20	W	Young's Double-slit and Gratings	25.4, 25.5

	03/22	F	Diffraction, Single slit, and Resolution	25.6 -25.8
11	03/25	M	Blackbody radiation and Photoelectric effect	27.1 – 27.3
	03/27	W	X-Ray production and Compton scattering	27.4, 27.5
	03/29	F	Atomic spectra and structure, Bohr model	27.6, 27.7
12	04/01	M	Review for Mid-Exam-3 (Chapter 23, 25, and 27)	
	04/03	W	Mid-Exam-3 (Chapter: 23, 25, and 27)	
	04/05	F	The wave-particle duality, Matter waves, and Electron Microscopy	28.1 - 28.3
13	04/08	M	The Uncertainty Principle and Wave Function for a confined particle	28.4, 28.5
	04/10	W	The Hydrogen Atom and Electron configurations for Atoms.	28.6, 28.7
	04/12	F	Lasers	28.9
14	04/15	M	Nuclear structure and Binding Energy	29.1.-29.2
	04/17	W	Radioactivity, Radioactivity Decay, and Biological Effect of Radiation	29.3 – 29.5
	04/19	F	Catch-up	
15	04/22	M	Review for final	
	04/30	Tu	Final Exam (Chapter 16 through 29)	

April 30<sup>th</sup> Tuesday

Final Exam (1:20 PM – 3:50 PM)

Cumulative

The location will be announced

The Final Exam schedule is determined by the University. I cannot move it up. No, you can not take it early. Please do not ask.

### FINAL EXAM: December 18<sup>th</sup>, (1:20 PM) 2009/2025 SCI (Cumulative)

\*\*\*\*\*ROOM IS SUBJECT TO CHANGE\*\*\*\*\*

#### TIPS FOR SUCCEEDING IN INTRODUCTORY PHYSICS:

There are a number of best-practices that are strongly correlated with achieving a high grade in introductory physics courses. These include:

- Attend lectures and quiz sections.** Regular class attendance is strongly associated with student success.
- Read the preface in the textbook.** In the preface, the authors have given you their best advice on how to use the text successfully.
- Complete the assigned reading.** This material should ideally be read both before and the class lecture. Make sure you read the “Master the Concepts” section at the end of each chapter. This provides a helpful summary of the material covered in this chapter.
- Put in the required time.** A typical suggestion is that students should work at least 2 hours outside of the classroom for every hour of lecture. This includes time spend before class getting familiar with the material and after class reviewing the material.
- Practice your problem solving skills.** Do the assigned homework, do the extra credit problems, and do supplemental problems from the textbook.
- Master the concepts.** It is important to understand the concepts underlying the equations covered in this course. Since a formula sheet will be provided for exams, there

is no need to memorize these equations. The challenge is in understanding how to apply them to solve specific problems.

7. **Attend office hours.** This will be most effective if you have specific problems that have arisen as you work through your assigned reading and weekly problems.

## TIPS FOR SUCCEEDING IN INTRODUCTORY PHYSICS:

There is no “secret” to succeeding at Introductory Physics. The things you must do to achieve your best results are amazingly clear and should not be unknown to you. Previous experience with many, many students has shown the following traits/habits seem to be common to most students who excel in the introductory physics course.

1. **Get a book.** Read it. Use it. There are LOTS of very good hints and ideas in the Preface. Most students do not read the Preface, but in it the authors have given you their best advice on how to use the text successfully.
2. Actually **read the text** (with a highlighter if you prefer). This is preferably done before the class lecture, and if possible, afterward as well. Make sure you read the “Master the Concepts” section at the end of each chapter – it is critical to summarizing what you’ve learned.
3. **Put in the time.** The text book recommends (and we agree) that you should be spending at least 2 hours outside of the class for every hour of lecture. This is at least 6 hours per week.
4. **Practice, practice, practice.** Do the quiz section assignments (before class), do the extra credit problems, and do the suggested problems. You can watch Michael Jordan play basketball for 3 hours a day, every day, and you will never get better at basketball – not unless you yourself put in the practice.
5. **Strive for understanding.** Many students feel if they just “get the answer” from a TA or help center person, they have accomplished the task. This is incorrect. You have accomplished your task when you truly understand the problem, how to set it up, how to solve it, and what it is asking. Just completing the problem to get some random answer is not enough.
6. **Attend your instructor’s office hours.** This will be most effective if you bring your book and your homework problems and ask him/her to help you identify your “sticking points.” Open-ended statements like, “I don’t get any of it,” will not be helpful in this setting.
7. **Do a self-evaluation (and be honest).** If you really want to know how you will do on the exam, give yourself an honest evaluation. Pick a few problems randomly from the text that you haven’t done before. A friend or family member can help with this. If you can solve it without any other help, you are ready. If you have no idea how to do it, you are not ready.
8. **Memorizing previously worked problems is NOT studying.** Many students feel exam preparation should consist of just “looking over” old problems and old exams. That is incorrect. An exam will generally consist of new, unseen problems. While completely understanding the assigned problems is a good idea, your best strategy is to try to work as many new problems as possible (this is accomplished by practicing, as suggested in tip 4).