

Syllabus
PHY 2140 - Winter 2015
General Physics II

Instructor:

Dr. Khadije Bazzi

E-mail: eb2920@wayne.edu

Office: Physics department (666 Hancock), Room 343

Class Time and Location:

Lecture Time: Monday and Wednesday at 6:00 - 7:20 pm

Active Learning Community Session (ALCS) Time: Monday at 7:30 – 9:20 pm

Room: 718 OAK (33737 W 12 Mile Rd, Farmington Hills, MI 48331)

Office Hours: M and W: 4 00 PM - 5:00 PM

Required Books (Both books are required):

I - PHYSICS, CHAPTERS 16 - 29

Authors: Giambattista, Richardson and Richardson.

Edition: 2nd

Publisher: McGraw Hill

ISBN: 9780077339685 - Available at the Campus Bookstore.

II- Tutorials in Introductory Physics

Authors: McDermott, Shaffer, and the Physics Education Group

Edition: 2nd

Publisher: Pearson

ISBN: 9780130653642 - Available at the Campus Bookstore.

Learning outcomes:

The main goal of this course is to give an introduction to physics based on algebra and trigonometry. The students should be able to:

- Apply basic physical laws to analyze real-life or unstructured situations (“word problems”), both descriptively and numerically.
- Analyze both existing situations, and situations that you or someone else wants to construct.
- State and paraphrase definitions and laws, and apply them in simple cases
- Have opportunity to practice, with feedback (e.g. homework) before exams.

Grade Determination:

| | |
|------------|------|
| Exam #1 | 15% |
| Exam #2 | 15 % |
| Exam #3 | 15 % |
| ALCS | 20 % |
| Homework | 5 % |
| Final Exam | 30% |

Grading Scale:

| Percent | Letter Grade |
|----------|--------------|
| 90 - 100 | A |
| 85 - 90 | A- |
| 80 - 85 | B+ |
| 75 - 80 | B |
| 70 - 75 | B- |
| 65 - 70 | C+ |
| 60 - 65 | C |
| 55 - 60 | C- |
| 50 - 55 | D+ |
| 45 - 50 | D |
| 40 - 45 | D- |
| 0 - 39 | F |

Exams:

There will be three in-class exams in addition to the cumulative final exam at the end of the semester. All of these exams will be closed book. The in-class exams will focus on selected chapters from the text, although you may be required to apply concepts from earlier chapters as well. There will be no make-up exams given. Exams missed because of a medical emergency or other valid reason will be dealt with on a case-by-case basis. You **MUST** bring your Wayne State ID to the exam and present it to a proctor when asked during the exam. No electronic devices (other than a calculator) are allowed in the room during the exam.

Exams will be based on the WebAssign problems (graded and non-graded together), the framework problems, and the conceptual questions, all modified using the methods below:

- A. No change
- B. Numbers changed
- C. Setup changed (e.g. decel instead of accel, motorcycle instead of car etc.)
- D. Solve for different variable (possibly using a different equation)
- E. Part of a problem
- F. Combinations
- G. For exams, multiple choices

Note 1: For those who do the WebAssign homework using someone else's work or solutions, and/or focus on individual problem solutions, not Frameworks, it is common to complain that the Exams are NOT based on the homework. Also, if this is your approach, the course will become more difficult, if not impossible, as the number of problem types to be memorized during the semester increases. However, if you work the problems yourself, using the Frameworks, the course does not require as much work, and grades typically improve during the semester as you get more experience with the Frameworks.

Note 2: There will be a final exam on Tuesday, May 5th from 1:20 pm to 3:50 pm. The exam will be the same for all sections of PHY 2140 and all sections will take the exam at the same time.

Homework:

Each week, several WebAssign problems will be assigned for credit. You “do” a WebAssign problem by logging in to the WebAssign site (www.webassign.net.). All students will need a WebAssign access key. These keys come bundled with the purchase of a new textbook in the university bookstore or can be purchased separately from the bookstore or the WebAssign website. I allow you five submissions for each problem, to get the answer right. You will lose 5% for each submission after the first.

Your WebAssign account will be set up by you using the following information:

- Class Key: **wayne 0647 9253**
- User ID: First initial and full last name, up to a maximum of eight characters total, excluding any special characters such as periods or dashes.
- Institution: wayne (just that, not Wayne State University or anything else)

Note 1: There are assignments labeled GRADED and NOT-GRADED assignments on the WebAssign. Only the GRADED assignments count toward your final grade. The NOT-GRADED assignments are provided for extra practice.

Note 2: Homework assignments will be due on Sundays at 11:00 pm.

Active Learning Community Session (ALCS):

ALCS meet once a week (Monday: 7:30 - 9:20 PM) and give you the opportunity to revisit concepts from the lectures and discuss the solutions to homework problems. ALCS allow students to work together in numerous activities such as tutorials, demonstrations, simulations, and other activities. Beside these activities, you will be given one quiz (15 min) every week. These will be collected and graded. At the end of semester, your lowest two quizzes score will be dropped. There will be no make-up quizzes given.

Note 1: For each week, the lesson plan will be posted on blackboard.

Note 2: For each session, students will need their textbook, tutorial book, laptop, calculator, and pencil and paper.

Additional Study Help:

If you have difficulty doing homework or lab work, or understanding some of the course material, you can get help from the *Physics Resource Center*, in room 172 Physics Building.

In-Class Policies:

Out of consideration for the other students in the lecture please abide by the following rules of conduct: (1) Turn off all cell phones while in the lecture hall, (2) Please arrive on time for lecture and do not leave early, (3) Please be mindful of your classmates.

Academic Dishonesty:

All of the graded assignments are designed to measure your individual understanding of the material. No forms of cheating on these graded assignments will be tolerated. Anyone found cheating on any graded activity will receive a grade of zero for that part of their grade, and may receive a failing grade for the course.

[Students with Disabilities:](#)

If you have any impairment that may interfere with your ability to successfully complete the requirements of this course, or you require additional resources in lectures or during exams, please contact the Education Accessibility Services (EAS) in Room 583 of the Student Center Building to discuss appropriate accommodations on a confidential basis. EAS can also be reached by phone at 313-577-1851.

[Course Drops and Withdrawals:](#)

In the first two weeks of the (full) term, students can drop this class and receive 100% tuition and course fee cancellation. After the end of the second week there is no tuition or fee cancellation. Students who wish to withdraw from the class can initiate a withdrawal request on Pipeline. You will receive a transcript notation of WP (passing), WF (failing), or WN (no graded work) at the time of withdrawal. No withdrawals can be initiated after the end of the tenth week. Students enrolled in the 10th week and beyond will receive a grade. Because withdrawing from courses may have negative academic and financial consequences, students considering course withdrawal should make sure they fully understand all the consequences before taking this step. The University has started a S.M.A.R.T. withdrawal advisory program that you must complete before completing a withdrawal.

[Plagiarism:](#)

In general, plagiarism is presenting someone else's work as your own, whether on purpose or through negligence. For a more detailed discussion, see

<http://www.is.wayne.edu/Policies2/Plagiarism.htm>.

In this course, for the first instance of plagiarism, the work will be graded down 40%. For the second instance, the assignment will be failed with a zero, and for the third, the course will be failed. In each case, including the first, a memo will be sent to the Physics Department describing the circumstances. The most important consequence of plagiarism, whether or not it is detected, is that you will not be able to do the work, and moreover you will not have the confidence that you can do that part of the work. Surely one of the primary benefits of a college-level course is the ability to step up in the outside world and say with confidence, "I can do that," and this is also the source of many of the other benefits. You will hang back instead of moving forward. You may "get away" with plagiarism once or even many times, but the main penalty, far worse than any grade punishment, is that your college education, which is one of the best things you can do for yourself, will not have the benefits you are looking for.

Tentative Class Schedule

| Date | Lecture Topics | Sections |
|-------------------|--|--|
| 1/12 (M) | Electric Charge- Electric Conductors and Insulators-Coulomb's Law- The Electric Field- Motion of a Point Charge in a Uniform Electric Field- Conductors in Electrostatic Equilibrium | 16.1 - 16.6 |
| 1/14 (W) | Gauss's Law for Electric Fields. Electric Potential Energy- Electric Potential- The Relationship Between Electric Field and Potential | 16.7 17.1- 17.3 |
| 1/19 (M) | Holiday | |
| 1/21 (W) | Conservation of Energy for Moving Charges- Capacitors – Dielectrics- Energy Stored in a capacitor. Electric Current – Emf and Circuits - Resistance and Resistivity | 17.4-17.7 18.1- 18.4 Skip (18.3) |
| 1/26 (M) | Kirchhoff's Rules – Series and Parallel Circuits- Circuit Analysis Using Kirchhoff's Rules- Power and Energy in Circuits – Measuring Currents and Voltages – RC Circuits – Electrical Safety. Magnetic Fields – Magnetic Force on a Point Charge | 18.5-18.11 19.1-19.2 |
| 1/28 (W) | Charged Particle Moving Perpendicularly to a Uniform Magnetic Field – Motion of a Charged Particle in a Uniform Magnetic Field: General – A Charged Particle in Crossed E and B Fields – Magnetic Force on a Current – Carrying Wire – Torque on a Current Loop – Magnetic Field due to an Electric Current – Ampere's Law | 19.3- 19.9 Skip (19.10) |
| 2/2 (M) | Review - Chapters: 16 – 18 | |
| 2/4 (W) | Exam1 (Wednesday, February 4th) 50 minutes duration | Chapters: 16 – 18 |
| 2/9 (M) | Motional Emf – Electric Generators- Faraday's Law- Lenz's Law - Back Emf in a Motor- Induced Electric Fields- Inductance – LR Circuits | 20.1 - 20.10 Skip (20.5 and 20.7) Skip (Ch. 21) |
| 2/11 (W) | Maxwell's Equations and Electromagnetic Waves – The Electromagnetic Spectrum – Speed of EM Waves in Vacuum an in Matter | 22.1- 22.4 Skip (22.2) |
| 2/16 (M) | Characteristics of traveling Electromagnetic Waves in Vacuum – Energy Transport by EM Waves – Polarization – The Doppler Effect for EM Waves. | 22.5- 22.8 |

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| 2/18 (W) | Wavefronts, Rays, and Huygens's Principle- The Reflection of Light – The Refraction of Light : Snell's Law – Total Internal Reflection | 23.1- 23.4 Skip (23.5) |
| 2/23 (M) | The Formation of Images Through Reflection or Refraction – Plane Mirrors – Spherical Mirrors- Thin lenses. | 23.6-23.9 |
| 2/25 (W) | Lenses in Combination – Cameras – The Eye | 24.1- 24.3 |
| 3/2 (M) | Review - Chapters: 19 – 22 | |
| 3/4 (W) | Exam 2 (Wednesday, March 4th) 50 minutes duration | Chapters: 19 – 22 |
| 3/9 (M) | Angular Magnification and the Simple Magnifier – Compound Microscopes – Telescopes. | 24.4 - 24.6 Skip (24.7) |
| | Spring break: Monday March 16 - Saturday March 21 | |
| 3/23 (M) | Constructive and Destructive Interference – The Michelson Interferometer – thin Films – Young's Double-Slit Experiment | 25.1- 25.4 |
| 3/25 (W) | Gratings – Diffraction and Huygens's Principle – Diffraction by a Single Slit – Diffraction and the Resolution of Optical Instruments – X-Ray Diffraction. | 25.5 - 25.9 Skip (25.10) Skip (Ch 26) |
| 3/30 (M) | Quantization – Blackbody Radiation -The Photoelectric Effect – X-Ray Production | 27.1 – 27.4 |
| 4/1 (W) | Compton Scattering – Spectroscopy and Early Models of the Atom-The Bohr Model of the Hydrogen Atom; Atomic Energy Levels- Pair Annihilation and Pair production | 27.5 – 27.8 |
| 4/6 (M) | Review - Chapters: 23 - 25 | |
| 4/8 (W) | Exam 3 (Wednesday, April 8th) 50 minutes duration | Chapters: 23 – 25 |
| 4/13 (M) | The Wave-Particle Duality-Matter Waves - Electron Microscopes –The Uncertainty Principle – Wave Functions For a Confined Particle | 28.1 - 28.5 |
| 4/15 (W) | The Hydrogen Atom: Wave Functions and Quantum numbers – The Exclusion Principle; Electron Configurations For Atoms Other than Hydrogen - Lasers. | 28.6 - 28.9 Skip (28.8 and 28.10) |
| 4/20 (M) | Nuclear Structure – Binding Energy - Radioactivity | 29.1 – 29.3 |
| 4/22 (W) | Radioactive Decay Rates and Half-Lives – Biological Effects of Radiation. | 29.4 - 29.5 Skip (29.6 -29.8) |
| 4/27 (M) | Review For Final | |
| 5/5 (Tuesday) | Final Exam : May 5th - 1:20 – 3:50 PM Room 150 General Lectures | Chapters: 16 – 29 |