

General Physics I PHYS 1114 Section 01 WILLIAMS (8 am MWF) Fall 2009
Engineering Physics I PHYS 2115 Section 01 (8 am MWF/T 8 am) Fall 2009

NOTE If you enrolled in Engineering Physics I this course is a team taught course with two sets of homework and two textbooks. This course (Gen Physics I) is 80% of Engineering Physics I for those enrolled in Engineering Physics I. Engineering Physics I students must come to a section of General Physics I at 8 am MWF with Dr. Williams and to a lab as well as the 1 hour component of calculus physics at 8 am Tues. taught by Dr. Rutledge. You must use Dr. Rutledge's Engineering Physics grading scale for final determination of letter grade. Grade in Engineering Physics II = .8 (% in GPII) + .2 (% in Engr Physics I one hour part).

PREREQUISITE for PHYS 1114: College Algebra

If you have not already passed this course-please don't take this class-very few succeed without them.

for PHYS 2115: Math 2825 Calculus I

2. Dr. Karen Williams, Professor, Physics Dept.

Office: P&ES 208

Office hrs: MWF 9-10:50 am, T 12-1, WR 1-2

Other times by appt.

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3. Course/Section Requirements

College Physics 6th Edition, Serway & Faughn (ISBN 0-534-49258-4)

General Physics 1114/1214 Laboratory Manual, 3rd ed., 2006 by Bruce Weems, Karen Williams

Scientific calculator (NO PROGRAMMABLE ONES), pencils, non spiral notebook paper

Attendance:

If you are not in the room when I take roll, you are absent-even if you come in later.

You are responsible for any announcements, quizzes, and assignments given in class so attendance is important.

Anyone with 3 consecutive absences may be academically withdrawn from the course.

A total of 6 absences may also trigger an academic withdrawal.

Missing 4 labs may result in an academic withdrawal as well.

Athletes missing work in lecture or lab must turn the work in one week from due date and inform

lab or lecture instructor of absence before the event.

No persons not enrolled in the class may attend.

Cell ringers are to be turned OFF in my classroom.

4. Course Objectives & Student Outcomes

These items are in accordance with items 3.a: Student Outcomes (general education)

4a. Literacy Understanding Skills:

Written Communication, Reading (1,2), Computer Literacy, Critical Thinking

1. Written Communication.

Students will write: lab reports, homework assignments, a paper, and usually a discussion question on each exam. On each of these items, students will be expected to write according to proper English grammar and spelling.

2. Reading.

Students will read and interpret: laboratory instructions, homework problems, portions of the textbook, and occasional articles that are provided to them. Reading and interpretation of text is critical in physics since misreading or misinterpreting text can lead to erroneous results in problem solving.

3. Computer Literacy.

Students will use the computer to participate in demonstrations of physics phenomena and to take data in the laboratory. Some students will use the computer to do their problem paper, although it is not required.

4. Critical Thinking.

Virtually every problem in physics and every laboratory experiment requires students to think critically about their own actions in the problem solving process. Students learn the difference between given quantities, constants, and what may be inferred by these given quantities when applying algebra to mathematical equations. Students will be required to make

judgments about further physics based upon results. Such thinking is also necessary to correctly respond to discussion questions of exams and those posed in class discussions. Thus, all assessment items listed in the grading section below act as assessment tools to assess critical thinking.

4b. Course Objectives: The objective is to use the study of General Physics I to address the student outcomes above and in 4b and 4c.

Fulfillment of Part I, items 3.b.1: Content Outcomes for laboratory sciences.

a. Students will apply the processes and methods involved in scientific investigations. They will study the scientific method in their laboratory experiments. For example, students will typically be provided a hypothesis and be asked to test the hypothesis experimentally. After experimentation, questions are normally given that pose additional hypotheses or constraints on what they have experimented with or observed. Students must be able to apply the scientific method in order to determine their response to the modified hypothesis or varied constraints. Some text readings will also point out the use of the scientific method in a particular scientist's work. In this way, students recognize "good science" when they see it again.

In other labs, students are given equipment and must utilize their skill as an observer and research in order to be the scientist to look, measure, ask questions, and form hypotheses and fact statements to aid in later hypothesis forming. This type of lab will be learning cycle style (inquiry based) and enables the student to be the scientist for real, not with the answer in front of him or her. Such investigations are open-ended and dependent upon the group doing the experiment. Every group and student often sees different data and only through cooperation may they develop the concept. In both cases, students will be required to communicate their results in a lab report and to make judgments based upon their evidence obtained in the lab.

b. Students will relate science to everyday occurrences. Physics is the study of the physical phenomena around us. Demonstrations often illustrate this for the student. For example, an allen wrench used the wrong way (short moment arm) versus the correct way (long moment arm) illustrates the idea of torque to the student. Most students have experienced the same phenomena on their own. Physics is thus a science for the everyday. Also, problems may illustrate the point. Students may calculate such quantities as the speed of a car involved in a wreck (common occurrence) based upon knowing the length of skid marks and the approximate value of the coefficient of friction or will calculate the energy consumed by a particular machine that is doing work.

c. Students should interpret the results of their laboratory work and demonstrations by using basic statistical methods. Sometimes this means the calculation of a percentage difference or error. Students will learn by experience why group or trial averages are taken in order to determine quantities (to reduce error). Students will learn that likewise, slopes are taken from lines drawn through data rather than calculated from 1 data point result in reduced error. Students must utilize value analysis methods to determine whether or not their points are too far from linear to be considered a curve. Students must examine their results and determine what errors are present in experiments such as one in which they measure the acceleration of gravity using a falling ball. They must examine whether or not mass is a variable affecting a ball's acceleration based upon their data using a large and small ball bearing. Decision making and value analysis must be used in such instances to determine if the affect from another variable is substantial enough to warrant another estimation of quantity (higher cost).

d. Concepts such as heat and calories will be discussed in terms of terms used to define them, and how society understands or uses these terms. For example, how much mechanical energy must be used to burn up so many calories in the human body. Chemistry and biology enters into such a case. Culturally, what does a 1200 cal diet mean? How does science determine the caloric content of food? Is this too much for the body or too little and what is the cost to the human in each case. Value analysis skills weigh all angles of similar arguments. Discussions and calculations about the value of wearing seat belts (less force, save life?) versus the dangers of not wearing them versus the danger of wearing them (burn in fire, pain from belt) will be discussed in terms of physics concepts and in terms of individual driver preferences and rights. Should seat belt wearing be a law? Value analysis and decision making enters into physics as it does in any science.

Fulfillment of Part I, item 3.b.2, Content Outcomes for Physical Sciences

These outcomes will be fulfilled as they are written in Part I.

Fulfillment of Part I, item 4 are the same as those written in Part 1, item 4.

4c. Course Competencies for (OK/NCATE Accredited Program Courses Only).

4c.2) OK/NCATE Subject Area Competencies to be addressed in this course:

1. Content. Teachers of science understand and can articulate the knowledge and practices of contemporary science.

They can interrelate and interpret important concepts, ideas, and applications in their fields of licensure; and can conduct scientific investigations.

To show that they are prepared in content, teachers of science must demonstrate that they

(a) understand and can successfully convey to students the major concepts, principles, theories, laws, and interrelationships of their fields of licensure and supporting fields as recommended by the National Science Teachers Association;

(b) understand and can successfully convey to students the unifying concepts of science delineated by the National Science Education Standards;

(c) understand and can successfully convey to students important personal and technological applications of science in their fields of licensure;

(d) understand research and can successfully design, conduct, report evaluate investigations in science

(e); and understand and can successfully use mathematics to process and report data, and solve problems, in their field(s) of licensure.

2. Nature of Science. Teachers of science engage students effectively in studies of the history, philosophy, and practice of science. They enable students to distinguish science from nonscience, understand the evolution and practice of science as a human endeavor, and critically analyze assertions made in the name of science. To show they are prepared to teach the nature of science, teachers of science must demonstrate that they:

(a) understand the historical and cultural development of science and the evolution of knowledge in their discipline;

(b) understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world;

3. Inquiry. Teachers of science engage students both in studies of various methods of scientific inquiry and in active learning through scientific inquiry. They encourage students, individually and collaboratively, to observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences. To show that they are prepared to teach through inquiry, teachers of science must demonstrate that they:

(a) understand the processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge;

5. Course Outline: Beginning course in mechanics, heat, and thermodynamics

These items are in accordance with item 5 of Part I.

PHYS 1114 will cover the material from chapters one through eleven of the text.

Exam 1: Ch. 1 & 2	Metric System, scientific notation, 1-D kinematics
Exam 2: Ch. 3	Vectors and 2-D kinematics
Exam 3: Ch. 4	Newton's Laws of Motion
Exam 4: Ch. 5&6	Work, energy, conservation laws, power, momentum, impulse, collisions
Exam 5: Ch. 7&8	rotational motion, gravitational law, rotational equilibrium & dynamics, angular momentum, torque
Exam 6: Ch. 9, 10	Archimedes' Principle, pressure, density, fluids in motion, thermodynamics, ideal gas law, kinetic theory of gases
Final: Ch. 11	Specific heat, calorimetry, latent heat, and heat transfer

6. Grading.

Please keep all graded papers and labs should a spreadsheet or grading error occur.

Mr Pfeffer grades the lab reports. Dr. Weems grades the prelabs. Dr. Williams grades homework and exams.

Each regular exam will be worth 100 points and you will be allowed to drop any one of the exams.

If you are satisfied with your grade and have turned in your ch 10 and 11 homework with at least 80% correctness, you may drop the final exam.

Your final grade will be calculated as follows: Add up all of your points on labs, homework, 6 exams, whiteboard group work, Prelab Questions and in class quizzes, etc. Divide this number by the possible number of points for these items. Multiply by 100 to get a percentage.

Look at the grading scale: 90-100 % A, 80- 89 % B, 70- 79 % C, 60- 69 % D, 0- 59 % F to obtain

your letter grade.

*Grades will be posted by secret #, if you do not want your grade posted, tell me. I will also post grades after exams on my page at: <http://homepage.mac.com/kwillims/NewCoursepage.html>

*If you have a question about a graded paper, ask me ASAP. In order for a grade change to be made, you must see me about the paper/grade within two weeks of the date that I returned them. This is to ensure fairness to all as my memory about the exam, etc. goes in about two weeks!

*No make up exams will be given unless (1) I am notified before the exam, (2) I deem the excuse an exceptional one, and (3) I have written documentation of said excuse. If more than **one exam** is missed for a death in the family or documented illness or for some unusual, but verifiable circumstance, the second missed exam score may be replaced by the score received on a comprehensive exam given during finals week in addition to the seven regularly scheduled exams. This comprehensive exam will only be given in extreme cases in which I deem that the documented excuse for missing more than one exam is acceptable.

*All work must be shown on exams, quizzes, and homework for full credit to be given.

*Any evidence of plagiarism or collaboration will be severely dealt with in an effective manner. I encourage students to study together, but no two students' papers should look alike since no two students think or speak alike. Copying or cheating will result in a zero on that paper.

*If I (or my proctor) catch you cheating on an exam after the drop day, you will receive an F in this course! If I catch you before the drop day, you will get a 0 on that work and that is not replaceable by the final exam.

ECU now has an **Academic Integrity Policy**. Violations of cheating, misrepresentation, and plagiarism may be reported to administration and maintained in the office of the Vice President for Academic Affairs for up to five years. Read the policy on the ECU website.

HOMEWORK:

Absolutely NO LATE homework papers will be accepted, regardless of the excuse (see rule for athletes).

I return graded papers within a few hours, so it is unfair to those that 'didn't have the answers'.

There will be 30 points of extra credit for the semester, so no one should be penalized because of a late paper.

Homework is due on the front table when I walk into class.

Each homework assignment is worth 10 points.

If I detect extensive copying of homework then I reserve the right to abolish the collection of any further homework in favor of giving closed-book quizzes instead.

WHITEBOARD PARTICIPATION:

I hope to implement some group work using whiteboards unless the class is too large.

2 pts. will be deducted if a student does not participate fully in the whiteboard groups; 1 pt. will be deducted if the student's participation is limited.

Prelabs & Labs- Labs will be in room 205.

Prelab Questions are due by 1 pm Monday.

Go to: <http://www.erskine.edu/bq/ecudefault.html> and select **PRECLASS**

then select from the pull down menu: **Fall09 Physics I/Eng PhysI.K.Williams taught by instructors**

The questions are ones that are easily answered by reading/using the lab book.

You may do the prelab only ONCE; If you accidentally hit enter in middle, you may do the prelab again.

Physics I Lab Schedule: Labs are Monday 3-5pm, Tues 10-12am and 1-3 pm all taught by Mr Pfeffer.

8/24-25	L1 Measurements	10/12-13	L7 Equilibrium of Rigid Body
8/31-9/1	L2 Uniformly Accelerated Motion	10/19-20	L8 Human Torques
9/7-8	No lab- Labor Day Holiday!	10/26-27	L9 Moment of Inertia
9/14-15	L3 Addition of Vectors	11/2-3	L10 Archimedes' Principle
9/21-22	L4 Newton's 2nd Law	11/9-10	L11 Linear Expansion
9/28-29	L5 Conservation of E and Momentum	11/16-17	L12 Specific Heat Capacity
10/5-6	L6 Uniform Circular Motion	11/23-24	L13 Joule's Law
		11/30-12/1	Makeup Lab-Simple Pendulum

If you are late to a lab, you do NOT get to do the lab.

One make up lab at the end of the semester is provided for one missed lab (see 11/30 or 12/1).

Labs are to be done in pencil.

Each lab will be graded from a total of 10 points. Each prelab is worth 10 points.

Answers to questions are to be in conventional English sentences and legible to the grader.

Your continued enrollment in this course constitutes your acceptance of these policies.

7. ADA Voluntary Self-Identification Policy:

East Central University is committed to providing equal access to university programs and services for all students. Under university policy and federal and state laws, students with documented disabilities are entitled to reasonable accommodations. If any member of the class has a documented disability requiring academic accommodations, s/he should report to the Office of Disability Services (telephone #: 580/559-5297). A student seeking reasonable accommodations originating from a documented disability must register with the Office of Disability Services so that said accommodations may be provided.

8. Writing Proficiency Policy:

In keeping with the university's emphasis on writing proficiency, all student produced writing will be expected to reflect clear content, coherent and organized structure, and adherence to stylistic and mechanical standards articulated by the professor. Students needing help with writing are encouraged to visit the Writing Center and talk with Dr. Kevin Davis in DH 101.

Important Dates:

Sept. 7 Labor Day Holiday

Nov. 25-27 Thanksgiving Holiday

Oct 15-16 Fall Break Holiday

Nov. 30 Last day to drop

Nov. 4 Last day drop with W

Homework/Test Schedule For Fall 2009

HOMEWORK Assignment with due dates. Do all problems, turn in starred problems listed.

8/21 Ch. 1 # 7,8,*9,10,12,16 a-c, 17, 19, 21, 22, 35, 36, *39, 41, 42, 43

8/26 Ch. 2 # 1, 3, 5, 6, 7, 11, *14, 18, 20, 21, 22, 25, 26, *27, 33, 43, 45, 50, 59

8/31 Test Ch 1 & 2

9/11 Ch. 3 # *6 a & by component meth, 9, 10, 13, 18, 22, *24, 25, 29, 30, 35, 36, 38, 39

9/16 Test Ch 3

9/23 Ch. 4 # 1, 2, 8, 11, *12, 15, 16, 17, 18, 26, 27, 28, 30, 31, 34, *36, 38, 39, 41, 44, 49

9/25 Test Ch 4

10/5 Ch. 5 #1, 4, 5, 8, 10, *12, 13, 14, 18, *21, 25, 27, 28, 31, 39, 43, 45, 48 in watts & hp

10/12 Ch 6: # 1, 2, 4, 5, 10, *15, 16, *18, 20, 24, 25, 26, 29, 35, 41, 43, 49

10/14 Test Ch 5, 6

10/26 Ch. 7 #1, 3, 4, *6, 7, 8, 15, 16, *18, 20, 21, 23, 24, 25, 26, 29, 35

11/2 Ch. 8 # 1, 2, 4, 9, *15, 16, 22, 23, *29, 30, 36, 39, 40, 44, 50

11/4 Test Ch 7&8

11/13 Ch 9 # *13, 14, 15, 18, 19, 26, 29, 35, *36, 38, 40, 41

11/18 Ch 10 #1, 10, 17, *21, 28, 30, 31, *36, 37, 39, 42

11/23 Test Ch 9 & 10

12/2 Ch 11 # 1, 2, 6, *7, 12, 13, 16, 20, 21, 22, *26, 28

12/7 FINAL EXAM CH 11 3-6 pm