Physics 1401 Syllabus
Fall 2013

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REQUIRED MATERIALS


• WebAssign Card, required for submitting homework on-line.

• Laboratory Manual

• Scientific calculator

OPTIONAL ADDITIONAL MATERIALS

• Sample Exam 1.


CORE CURRICULUM OBJECTIVES

Upon completion of this course, the student will demonstrate his or her abilities to think critically, communicate quantitative information, develop empirical and quantitative skills, and work in team:

1. Critical Thinking: Develop and present a logical, consistent plan to solve a problem, recognize consequences of the solution, synthesis the information, and articulate a reason for choosing solution method. The analysis of data and observable facts will result in
informed conclusions. 2. Communication: Use and present quantitative information in connection with an argument or problem solution and explicate it in an effective format. Demonstrate abilities to communicate the interpretation of ideas in writing. 3. Empirical and Quantitative: Manipulate and analyze numerical data or observable facts resulting in informed conclusions. Report a detailed solution to a problem using experimental data, with evidence to relevant contextual factors and possible approaches for solving the problem. Draw insightful conclusions. 4. Teamwork: Ability to work well in a team, to cooperate in collecting experimental data, to contribute in any leadership role, to accept leadership and guide the group to successful results.

1. Solving problems using laws, principles, and theories

Students will learn to develop critical thinking, empirical and quantitative skills in solving physics problems, and communication skills in writing the thought process, the results, and conclusions. The instrument for assessment will be solving complex physics problems using an algebra-based approach. The student should identify the key information and place the problem in the right physics context. The student will evaluate the information provided with insight and will reason carefully starting from clearly stating the premises, to important implications and consequences. The analysis of numerical data and observable facts will result in informed conclusions. The students will thoroughly interpret the meaning of the results obtained in solving the problem from the physical phenomenon perspective. He/she will synthesis the information in a concise but clear conclusion. Faculty will use a rubric to assess scientific understanding, critical thinking, and empirical and quantitative skills, and communication skills.

2. Experimental Analysis of Physical Phenomena

In a lab environment, the students will learn to consider and discuss different points of view when working in a group and will work effectively with others in order to support a shared purpose. At the end of the lab, the teamwork will be assessed in a lab report turned in by each student, showing the cooperation in data acquisition and analysis; participation in sharing tasks and responsibilities within the group, including the leadership the role. The faculty will use a rubric to assess the teamwork.

**Overview of Physics 1401**

Physics 1401 is the first course in the introductory, algebra-based physics sequence. Physics 1401 is a difficult course. With small variations, the Physics 1401-1402 sequence is a standard sequence taught throughout the country. The amount of material covered in the course is determined by national standards, not by individual institutions or individual instructors.

**Pace.** University courses cover material too rapidly for you to understand almost everything as the lecture progresses. However, you should be able to understand all lecture material when you study the lecture notes. Since you should have already attempted all homework problems, you should understand the solution to each homework problem as it is discussed in recitation. Also, if you do the assigned reading before coming to lecture, chances are that you will understand everything in lecture.

**Cognitive Dissonance.** The Phys 1401-1402 sequence is not easy. You will need to learn
concepts which often conflict with “common sense.” When you take a language course without knowing a single word of the foreign language, you bring to it your ideas about grammar and the corresponding structure in your brain. Similarly, it is impossible to enter a physics course without bringing to it your “common sense” ideas of how the world works. These “common sense” ideas more often correspond to the physics of Aristotle than to the physics of Galileo and Newton. Therefore, you may often find yourself confused. This “cognitive dissonance,” to use a term for the conflict between a preconceived notion and a scientific conclusion, is wired up in our brain. My role as an instructor is to assist you in sorting out those “common sense” ideas and to help you identify the few physical principles that describe the world around us. For your part, the important thing is to work your way through this stage of the learning process. Since nothing is achieved without effort, you will need to plan to spend at least two hours of studying for each hour in class, whether lecture or recitation or laboratory. You are also expected to attend all classes. The only variable for which psychologists have been able to find a correlation with grades is attendance in class. This is true not only for physics, but for all the courses you are taking.

Physics is a science; but it is also an art. It is not just math. Like all arts, it is best learned by working with and observing how those who have already mastered the skills proceed. It won’t come to you at once, but you can do it.

**EIGHT KEYS TO SUCCESS IN A TECHNICAL COURSE**

The two most important keys to success are as follows:

1. Be able to work every lecture and homework problem quickly and correctly before taking a quiz or exam.

2. Learn to apply the basic concepts and do not just memorize solutions to specific problems. Exam problems are almost always different from homework problems, but they require mastery of the same concepts.

Six additional keys to success are as follows:

3. Read the assignment before class.

4. Review each lecture the same day it is given, and start doing the homework assignment associated with that lecture.

5. Study physics almost every day rather than for longer periods a few times each week.

6. Attempt every homework problem in each assignment. Try to do homework problems the same way you would do exam problems. Try not to look back in the text, and try to use formulas from memory. If you get stuck, then look at the textbook.

7. Keep a list of key formulas for each chapter.
8. Have a corrected copy of each homework assignment within one day after the problems have been covered in class.

**SOLVING TECHNICAL PROBLEMS**

There are two stages in learning how to solve technical problems:

1. Understanding a solution to a problem when it is presented by the instructor.
2. Creating the solution by yourself.

If you do not actually do the homework, but instead rely on seeing the problems solved in recitation, you may only reach stage 1. While achieving stage 1 is necessary, all points in the course are awarded for achieving stage 2.

**GRADING**

The course grade is based on your performance on class, homework, laboratory, exams, and a comprehensive final examination. The dates for the exams and final exam are listed in the assignments section. If, in the judgment of your instructor, you have a valid excuse for missing class when an exam is given, the work may be made up in a method determined by your instructor. A course grade of incomplete will be given only if prior arrangements are made. There will be an 8-point (3-point) penalty on your final grade for each class you miss (are late). Tampering with the attendance sheet will be penalized with an F.

Knowing how to do the homework is the key to pass the course. Thus, if by the time of each exam your overall homework grade is less than 40%, you will be given a score of 0 for that exam, no matter what your test score might have been.

**LABORATORY**

A passing grade in laboratory is required to pass the course (at least 62% of the lab grade). If you miss a lab, you must either have a written doctor’s excuse or an excuse approved by your laboratory instructor to avoid having a score of zero recorded for the missed lab. Bring a calculator to the laboratory.

**HOMEWORK**

All homework assignments will be submitted and graded via the online software package WebAssign. If you have difficulty with any technical issues involving WebAssign, please contact me.

**Logging into WebAssign:**

1. Go to https://luonline.blackboard.com/webapps/login/
2. Login with your lamar username and password.
3. Click on the Physics 1401 course link. Then click on “Tools.” Then click on “WebAssign.”

Policies.
A tentative list of homework assignments is listed in the syllabus. WebAssign will deliver you the definitive list. WebAssign randomizes some numerical values of the problems, so each student has to give a different answer. For each part of each problem, WebAssign assigns point values, which are indicated adjacent to the problem statement. At the end of the semester, your homework points will be determined as follows:

\[
\text{Homework points} = \frac{\text{Total number of points received on all assignments}}{\text{Total number of points possible from all assignments}} \times 91
\]

Due dates are specified in the syllabus. You may submit answers to part or all of the assignment at any time before 1:00 AM on the due date. Save your work by pressing the “SAVE WORK” button. WebAssign will automatically grade your responses to part or all of your assignment once you “SUBMIT WORK FOR GRADING.” If you are unhappy with your score, WebAssign will indicate which problems you have not answered correctly, and you may reattempt any part of a problem up to 50 times before the due date. Failure to submit an answer for a problem or part of a problem results in a zero for that part of the problem. The grade received on the last submission before the due date/time is the one that will be recorded even if this submission did not result in the highest score. No extensions will be granted for online homework assignments. Assignments may be viewed but are no longer available to be worked on after the due date, although the key and the solution to each problem become available after the due date. Excuse from an online homework assignment is possible only in the following special cases: a. hospitalization b. illness of the student (requires a physician’s note) c. death of a parent or sibling d. military duty. Should one of the above special cases arise, you must provide your instructor with appropriate documentation in order to obtain an excuse.

WebAssign provides a STUDENT GUIDE online. You should read this and familiarize yourself with the package. WebAssign also provides a tutorial so you can learn how the system works. Some quick, basic guidelines for the program are given below; however, you should consult both the tutorial and the STUDENT GUIDE for definitive information on how to use the program. Fill-in-the-blank numerical questions have a tolerance of plus or minus 2% to take into account any round-off errors that might occur. Problems involving angular measurements in radians may be particularly sensitive to how many decimal points you keep. Responses should be entered either as decimal numbers or in scientific notation. Enter “0.5”, not “1/2.” Enter “2.13*10**-3” for “2.13 \times 10^{-3}.” You should keep 4 significant figures in intermediate steps and enter your answer to at least 3 significant figures, even if there are fewer significant figures in the problem.

EXAMS

No materials may be consulted during a quiz or exam unless specifically permitted by your instructor. A calculator is necessary for exams, but all memory must be erased. You
are not permitted to use the calculator on your cell phone or other communication device during an exam or quiz.

**Exam Return Policy**

Exams will be returned during class. Solutions to exams will be posted in the hallway of Archer Hall.

**Exam Hints**

1. For each exam problem, write the formula, then substitute numbers into the formula, and write the answer.

2. If you can’t work one part of a problem but need that answer to work successive parts of the problem, represent the answer you can’t find with a symbol. Work the remainder of the problem using that symbol.

3. Never spend a great deal of time on an exam problem when you are “stuck.” Work everything else on the exam before coming back to the problem you cannot solve. Sometimes the solution will occur to you while you are working on another part of the exam.

**Electronic Devices**

Other than calculators, all electronic devices (cell phones, beepers, walki-talkies, CD players, radios, etc.) should be turned off and put away before class, exams or quizzes begin, unless prior arrangements have been made with the instructor.

**Drop Dates and Drop Policy:**

Please make note of the three dates indicated in this drop policy. Any drop will be your responsibility; I will not drop a student from the course.

* September 11, 2013: (Census Date-Six Drop Rule does not apply) A student may drop or withdraw without consulting with the instructor. The Six Drop Rule does not apply to a drop before 5:00 PM.

** September 30, 2013: (Six Drop Rule applies) A student may drop or withdraw from the course without academic penalty and receive a Q, however, the Six Drop Rule applies after 5:00 PM on September 11, 2013. The student will consult with the instructor and the Records Office to initiate a drop.

*** November 4, 2013: (Six Drop Rule applies) Last day to drop or withdraw with academic penalty; the student must be passing the course at the time of the requested drop in order to receive a Q. The drop form, including all required signatures, must arrive in the Records Office by no later than 4:00 PM. No drop is allowed after this date except in extreme extenuating circumstances. Any “late drop” must be approved by the instructor, department chair, college dean, and provost.
ACCOMMODATIONS

It is the policy of Lamar University to accommodate students with disabilities, pursuant to federal and state law and to the University’s commitment to equal educational opportunities. Students with a documented disability should contact the Director of the Office of Services for Students with Disabilities (SFSWD) which is located in 105 Communication Building. Students may write to P.O. Box 10087, Beaumont, Texas 77710, call 409.880.8347, fax 409.880.2225 or e-mail SFSWD@lamar.edu. The Director will arrange to meet with the student to determine reasonable academic adjustments and/or accommodations. Additional information is available at http://dept.lamar.edu/sfswd.

EMERGENCY PROCEDURES

Many types of emergencies can occur on campus; instructions for severe weather or violence/active shooter, fire, or chemical release can be found at: http://www.lamar.edu/about-lu/administration/risk-management/index.html. Following are procedures for the first two:

Severe Weather:

• Follow the directions of the instructor or emergency personnel.

• Seek shelter in an interior room or hallway on the lowest floor, putting as many walls as possible between you and the outside.

• If you are in a multi-story building, and you cannot get to the lowest floor, pick a hallway in the center of the building.

• Stay in the center of the room, away from exterior walls, windows, and doors.

Violence/Active Shooter (CADD):

• CALL- 8-3-1-1 from a campus phone (880-8311 from a cell phone). Note: Calling 9-1-1 from either a campus phone or cell phone will contact Beaumont City Police Dispatch rather than University Police.

• AVOID- If possible, self-evacuate to a safe area outside the building. Follow directions of police officers.

• DENY- Barricade the door with desks, chairs, bookcases or any other items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police it is safe.

• DEFEND- Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.
**Academic Integrity**

Students are expected to maintain complete honesty and integrity in their academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. Students are specifically warned against all forms of cheating and plagiarism. The Lamar University Student Handbook clearly reads: “Any student found guilty of academic dishonesty in any phase of academic work will be subjected to disciplinary action. Punishable offenses include, but are not limited to, cheating on an examination or academic work which is to be submitted, plagiarism, collusion, and the abuse of source materials.” One aspect of the Handbook’s definition of cheating includes “purchasing or otherwise acquiring and submitting as one’s own work any research paper or other writing assignment prepared by an individual or firm.” Plagiarism is defined as “the appropriation and the unacknowledged incorporation of another’s work or ideas into one’s own and submitted for credit.” Faculty members in the College of arts and Sciences investigate all cases of suspected plagiarism. Any student who is found cheating in this course will receive a course grade of F. http://dept.lamar.edu/studentaffairs/handbook.htm

**Class Cancellation**

To determine if the campus has been closed, you may listen to the radio or call the Campus Severe Weather Information number. If a class has been canceled, I will post an announcement on Blackboard that will tell you how the class will be made up.

In the event of an announced campus closure in excess of four days due to a hurricane or other disaster, students are expected to login to Lamar University website’s homepage (www.lamar.edu) for instructions about continuing courses remotely.

**Help is Available**

- The Lamar Physics Lab
### Laboratory Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Subject</th>
<th>First Day of Lab</th>
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<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td><strong>Lab 1:</strong> Density</td>
<td>Aug 26</td>
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<tr>
<td><strong>Week 2</strong></td>
<td><strong>No lab</strong></td>
<td>Sep 2</td>
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<tr>
<td><strong>Week 3</strong></td>
<td><strong>Lab 2:</strong> Almost free-fall</td>
<td>Sep 9</td>
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<tr>
<td><strong>Week 4</strong></td>
<td><strong>Lab 3:</strong> Force and vectors</td>
<td>Sep 16</td>
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<tr>
<td><strong>Week 5</strong></td>
<td><strong>Prep 1:</strong> Practice Problems for Exam 1</td>
<td>Sep 23</td>
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<tr>
<td><strong>Week 6</strong></td>
<td><strong>Lab 4:</strong> Net force causes acceleration</td>
<td>Sep 30</td>
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<td><strong>Week 7</strong></td>
<td><strong>Lab 5:</strong> Collisions on air tracks (Lab Carts)</td>
<td>Oct 7</td>
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<tr>
<td><strong>Week 8</strong></td>
<td><strong>Prep 2:</strong> Practice Problems for Exam 2</td>
<td>Oct 14</td>
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<tr>
<td><strong>Week 9</strong></td>
<td><strong>Lab 6:</strong> Ballistic pendulum</td>
<td>Oct 21</td>
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<tr>
<td><strong>Week 10</strong></td>
<td><strong>Lab 7:</strong> Angular momentum</td>
<td>Oct 28</td>
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<tr>
<td><strong>Week 11</strong></td>
<td><strong>Prep 3:</strong> Practice Problems for Exam 3</td>
<td>Nov 4</td>
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<tr>
<td><strong>Week 12</strong></td>
<td><strong>Lab 8:</strong> Rolling objects</td>
<td>Nov 11</td>
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<tr>
<td><strong>Week 13</strong></td>
<td><strong>Prep 4:</strong> Practice Problems for Exam 4</td>
<td>Nov 18</td>
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<tr>
<td><strong>Week 14</strong></td>
<td><strong>Lab 9:</strong> Measuring a spring’s stiffness</td>
<td>Nov 25</td>
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<tr>
<td></td>
<td>The simple pendulum</td>
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<tr>
<td><strong>Week 15</strong></td>
<td><strong>Lab 10:</strong> Thermodynamics</td>
<td>Dec 2</td>
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