IMPERIAL VALLEY COLLEGE
PHYSICS 200 – GENERAL PHYSICS I

Course Syllabus – Fall 2009

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Office Hours: Mondays and Wednesdays 10:00 AM to 11:00 AM and 2:30 PM to 3:00 PM, Tuesdays and Thursdays 11:00 AM to 12:00 PM.
Code: CRN 10344

Class Meetings:
Lecture: Tuesday and Thursday 7:00 AM to 8:50 AM, Room 201.
Lab: Monday and Wednesday 7:00 AM to 8:25 AM, Room 410.

Author: Halliday, Resnick, and Walker.

Prerequisite: Math 192 with a grade of “C” or better.

Course Philosophy: This course is designed to give an understanding of the fundamental principles of physics in the area of mechanics.

Student Learning Outcomes (SLOs)

1. The student will solve problems involving SI units, scientific notation, dimensional analysis, and calculations to the proper number of significant digits.
2. The student will solve problems involving vectors, scalars, frames of reference, components of a vector, and unit vectors.
3. The student will solve one-dimensional motion problems involving position, velocity, and acceleration.
4. The student will solve problems involving two-dimensional motion with vector applications.
5. The student will solve problems involving Newton’s Laws and their applications including friction.
6. The student will solve problems involving circular motion, accelerated frames of reference, and motion in the presence of resistive forces.
7. The student will solve problems involving work, energy, and power.
8. The student will solve problems involving potential and kinetic energies and conservation of energy.
9. The student will solve problems involving impulse, momentum, and center of mass.
10. The student will solve problems involving rotation about a fixed axis of a rigid body.
11. The student will solve problems involving angular momentum and torque as vector quantities.
12. The student will solve problems involving static equilibrium of a rigid body.
13. The student will solve problems involving simple harmonic motion, damped, and forced oscillations.
14. The student will solve problems involving the law of universal gravitation, Kepler’s Laws of planetary motion, and gravitational potential energy.
15. The student will solve problems involving the mechanics of solids and fluids.

**Grading Criteria**
Course must be taken on a “letter-grade” (LG) basis only.

**Grading Policy**
The student’s grade will depend on the following areas:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
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<tbody>
<tr>
<td>Homework (15)</td>
<td>10 points each = 150 points</td>
</tr>
<tr>
<td>Tests (1-2-3-4)</td>
<td>50 points each = 200 points</td>
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<tr>
<td>Labs Reports with Rubric (3)</td>
<td>25 points each = 75 points</td>
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<tr>
<td>Other Lab Reports (6)</td>
<td>20 points each = 120 points</td>
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<tr>
<td>Mid-term (1)</td>
<td>100 points</td>
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<tr>
<td>Final Exam (1)</td>
<td>100 points</td>
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<tr>
<td>Reading Questions (15)</td>
<td>10 points each = 150 points</td>
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<tr>
<td>Other*</td>
<td>105 points</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>1000 points</strong></td>
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</tbody>
</table>

*It may include quizzes, special projects, presentations, review questions, ticket out the door, etc.

All grades are calculated by using the standard scale of:

- A = 100-90%
- B = 89-80%
- C = 79-70%
- D = 69-60%
- F = 59% and below

**Class Rules and Expectations**
1. Failure is not a good choice, so apply yourself, study, do not give up on the first try, attend class regularly, ask for help when needed, and always do your best!
2. The student is expected to attend class meetings regularly. After the third absence, if the student does not drop the class via Webstar, he/she will receive an “F” as final grade; so it is the student’s responsibility to drop before the deadline.
3. What constitutes an absence? Not showing up to class during a regular class meeting, or arriving more than 20 minutes after the beginning of the class, or leaving more than 20 before the end of the class.
   a. Example: Class starts at 10:00 AM and ends at 12:00 PM. If you arrive after 10:20 AM you are absent. If you leave before 11:40 AM you are marked absent. If you leave the room for more than 20 minutes for whatever reason, you are absent.
4. What constitutes a tardy? Arriving within the first 20 minutes after the beginning of the class or leaving within the last 20 minutes before the end of the class (3T = 1A).
   a. Example: Class starts at 10:00 AM and ends at 12:00 PM. If you arrive between 10:01 AM and 10:20 AM you are marked tardy. If you leave between 11:41 AM and 12:00 PM you are marked tardy as well as if you “disappear” from the room for no more than 20 minutes (i.e. having lunch). If you need to use the restroom, you are expected to return within a reasonable time period.
5. If a student reaches the fourth absence after the deadline, his/her grade will be reduced one letter grade for each subsequent absence.
   a. Example: your current grade is a “B.” On the 4th absence you will get a final grade of “C,” on the 5th one, your grade is “D,” and on the 6th one and beyond, your final grade is
“F.” Exceptions include-for example- hospitalization for several days and with appropriate documentation.

6. Deadline to drop the class with a “W” is Friday, November 13, 2009. Late drops on graded classes will require that the student receive an F.

7. Class materials such as a notebook or binder with lined or quad ruled paper, pen, pencil, scientific calculator, and the textbook will be brought to every class meeting.

8. It is up most important that students review the material to do well on exams.

9. Students are encouraged to form study groups to meet regularly to keep up with assignments and to study for tests/mid-term/final exam.

10. Late assignments will not be accepted. It is student’s responsibility to turn assignments in when they are due regardless he/she is absent (no excuses!).

11. Students will not be allowed to make up a test or exam or final exam.

12. The work is individual which means that you are responsible for what you turn in regardless whether you were part of a team or group. It is understandable that you may need to share data with partners but you are expected to write up your own assignments. Identical assignments will not be accepted; failure to comply will result in a “zero” for that specific assignment.

13. No photocopied textbooks are allowed. No audible pagers or cell phones allowed. You will be dropped on your second offense for disturbing the class in this manner.

14. No food or drinks are allowed in the classroom.

15. No children are allowed in the classroom.

16. Absences attributed to the representation of the college at officially approved conferences and contests and attendance upon field trips will not be counted as absences (this includes sports). However, the student is responsible for notifying the instructor and for the work done in class. If your absence coincides with an exam, it is student’s responsibility to contact the instructor via e-mail or by phone before the following class meeting to make it up. Failure to do so will result in a “zero” for that particular exam.

17. Discipline: you need to understand that this is a college class, the “good high school days are gone.” Appropriate behavior is expected at all times (i.e. not speaking out of turn, raise your hand to talk and wait until acknowledged, paying attention, avoid side comments, not answering your cell phone in class, working in assignments for another class, etc.). For this reason, no discipline problem will be tolerated.
   a. First offense: warning.
   b. Second offense: student will immediately be dropped from the class.

18. Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs and Services (DSP & S) office as soon as possible. DSP&S, Room 2117, Health Sciences Building, (760) 355-6312.

Calendar* (It may be subject to modification according to students’ needs)

<table>
<thead>
<tr>
<th>WEEK</th>
<th>CORE CONTENT</th>
<th>READING DUE</th>
<th>ASSIGNMENT DUE</th>
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<tbody>
<tr>
<td>1</td>
<td>Syllabus / Introduction Measurement</td>
<td>Chapter 1</td>
<td></td>
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<tr>
<td>2</td>
<td>Vectors</td>
<td>Chapter 3</td>
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<td>3</td>
<td>Motion in One Dimension</td>
<td>Chapter 2</td>
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<tr>
<td>4</td>
<td>Motion in Two Dimensions</td>
<td>Chapter 4</td>
<td>Test # 1</td>
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<td></td>
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<td></td>
<td>(Chapters 1-2-3)</td>
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<td>5</td>
<td>Force and Motion-I</td>
<td>Chapter 5</td>
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<td>6</td>
<td>Force and Motion-II</td>
<td>Chapter 6</td>
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<tr>
<td>Chapter</td>
<td>Topic</td>
<td>Test/Exam</td>
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<td>7</td>
<td>Kinetic Energy and Work</td>
<td>Test # 2 (Chapters 4-5-6-7)</td>
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<td>8</td>
<td>Potential Energy and Conservation of Energy</td>
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<td>9</td>
<td>Center of Mass and Linear Momentum</td>
<td>Mid-term (Chapters 1-7)</td>
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<td>10</td>
<td>Rotation</td>
<td>Chapter 10</td>
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<td>11</td>
<td>Rolling, Torque, and Angular Momentum</td>
<td>Test # 3 (Chapters 8-9-10)</td>
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<tr>
<td>12</td>
<td>Equilibrium and Elasticity</td>
<td>Chapter 12</td>
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<tr>
<td>13</td>
<td>Gravitation</td>
<td>Chapter 13</td>
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<tr>
<td>14</td>
<td>Fluids</td>
<td>Chapter 14</td>
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<tr>
<td>15</td>
<td>Oscillations</td>
<td>Chapter 15</td>
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<tr>
<td>16</td>
<td>Review for Final Exam</td>
<td>Final Exam (Chapters 8-15)</td>
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</table>

* It may be subject to modification.

**Homework:** The purpose of homework is to provide the student with sufficient practice to master all topics studied in class and to do well on tests. Each homework assignment is due no later than a week after we complete each chapter. For example, if we finish chapter # 1 on February 20th, homework # 1 is due on February 27th. From each chapter you are required to answer any 10 problems not previously solved in class.

When turning in homework assignments please include the following information: Your Name, Class Code, Homework #, Page #, and Problem #. Failure to do so may result in inaccurate grade recording.

**Lab Reports with Rubrics:** You will turn in three (3) reports using the rubric posted in the webpage:
- ✔ Motion with Constant Acceleration
- ✔ Newton’s Second Law of Motion
- ✔ Conservation of Linear Momentum

They must be typed, double-space, font Times New Roman or similar, size 12, and the graphs must be done with Excel or any graphing program (i.e. TI InterActive). Also attach a copy of the rubric with your self-assessment (its purpose is to learn how to judge your own work and the points you assign to each category will not affect your final grade in any way).

Reports are due a week after the specific experiment has been performed (If the experiment was done on September 03, it is due on September 10). You will be allowed to make one set of corrections after the first draft has been turn in, and within a week. A grade will be assigned accordingly.

**Other Lab Reports:** These reports must be typed, double-space, font Times New Roman or similar, size 12, and the graphs must be done with Excel or any graphing program (i.e. TI InterActive). You may also use the rubric as a guideline.
Point Distribution (maximum number of points per category)

- Objective or goal: 1 point
- Summary or background information: 3 points

The following is an example of a summary written by a student (keep in mind that the setup was different from the one we will use in Physics 200).

“The second law of Newton allows for the calculation of acceleration, given that mass and the acting forces are known. If a body is allowed to move freely along a level surface, and the forces of friction neutralized, then the acceleration of the body and its net force can also be found. In this situation, a laboratory cart with one end attached to a recording timer, and the other end to a string is released from rest. The string has one mass attached to compensate for the effects of friction. Another mass of exactly 1 kg is attached to provide for acceleration by means of a pulley and the effect of gravity. The acceleration of gravity will therefore have an accelerating force of 9.8N (f=ma), which in turn, will pull the laboratory cart across the level surface. By examining the number of dots per time interval on the timer tape, along with the total displacement, the acceleration of the cart can be found; the average acceleration was determined to be 9.12 m/s/s. By multiplying the acceleration by mass, the force (f=ma) can also be found, which was 10.06N, or about 2.7% higher than the known value of the gravitational force of 9.8N. Experimental errors could have been caused due to the amount of mass needed to equalize the frictional force. I will suggest performing the experiment three times and determining the average.”

- Data Table (s): 3 points
- Sample calculations: 2 points
- Answers to all questions: 4 points
- Graphs: 3 points
- Conclusion: 4 points

You are required to answer all the questions using complete sentences. For example: Yes, No, Linear relationship are not accepted answers unless you justify why. Also include data tables (you may modify them if you feel it appropriate), one set of sample calculations (show how you came out with all the values entered in your table), objective (the goal of the experiment is to determine the acceleration due to gravity), a summary of the experiment (see above) and a final conclusion (about 1/2 page long) in which you will discuss the results citing specific evidence, discuss the validity of the experiment including experimental error, and suggest methods of improvement.

Reports are due a week after the specific experiment has been performed (If the experiment was done on September 03, it is due on September 10). You will be allowed to make one set of corrections after the first draft has been turn in and within a week. A grade will be assigned accordingly.

Reading Questions: They are available in the webpage in PowerPoint format. You will read the questions and you will answer them as you read the textbook. Since they are multiple-choice, you will pick the best answer to each statement according to your interpretation along with a brief justification (i.e. page 27, line 3). Correct answers are provided to check your understanding. If your answers do not agree, go back and see if you are able to figure out why that given answer is the right one instead of the one you have chosen. They are due the first Thursday of the week we start each chapter (for example, if we start chapter 2 on Monday September 14, your questions are due on Thursday September 17).

Tests or Exams: They may be only multiple choice or multiple choice and free response questions. No makeup exams!

Mid-term and Final Exam: They may include questions from the tests (recycled questions) and new questions (you have not seen them before but with similar difficulty to the other questions). No makeup exams!

Other Assignments: It may include review questions, quizzes, special projects, etc. and they will be announced in advance.