Fall 2005  
Physics 201A – Physics for Scientists and Engineers  
Credits: 5  
M, Th: 7:30am – 9am, SMT- 231  
T, F: 7:30am – 9am, SMT 225  

Instructor: Chitra Solomonson  
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Office Hours: 9am to 10am M, Tu, Th, Fri.  
OR  
By appointment  

Materials  

- **Required Textbook:** *Physics for Scientists and Engineers Volume 1* (sixth edition), by Serway and Jewett, published by Thomson, Brooks/Cole. ISBN 0-534-40845-1 (Student Edition with InfoTrac College Edition) and ISBN 0-534 – 42374-4 (Student Edition without Infotrac College Edition). InfoTrac is an extensive online library that gives you access to thousands of publications. Subscription to InfoTrac is not a requirement for this course. As I may be assigning problems from the textbook in class, it would be advisable to bring it to the classroom everyday.  
- **A Three Ring Binder:** This is absolutely essential to organize your materials for this course. You will be completing many weekly homework, quizzes and class worksheets for this course. Make sure all your handouts and work completed is filed away in your binder. This valuable resource will help you to consolidate all your study material for the final exam. You need not bring the binder to class everyday.  
- **A Scientific Calculator:** A TI-83 or equivalent should be more than sufficient for this course and should be part of your ‘classroom kit’.  
- **Miscellaneous:** A ruler, a sharp pencil, graph paper and other small items may be specified as the need arises in the course.  

Description  

Phys 201 is the first of a three course sequence of Physics courses for students in the science and engineering track. It deals with the laws of our mechanical world. We will be setting the stage by understanding measurement and units then proceed to Newton’s Laws of Motion including the concepts of momentum and energy. We will aim to learn the material in Chapters 1 to 7 of Physics for Scientists and Engineers (sixth edition) by Serway and Jewett. Laboratory is an integral part of the course. This course satisfies math/science or lab science requirement for AA and AS degrees.
Prerequisites: High school physics or equivalent; or MATH 124 or concurrent enrollment.

Instructional Method
Physics is a contact sport – you learn by doing it. In that spirit, this course is intended to be an extremely hands-on and minds-on course. The instructor will be merely a facilitator of the learning process. You, as the student, are on center stage. It is your responsibility to participate fully in the laboratory activities and problem-solving sessions. The more you jump in to participate by asking questions, participating fully in the lab activities and analyzing what you observe, the better your learning experience will be. You are responsible for your own learning in this course. The instructor will be the facilitator.

One of the chief objectives of this course is to acquire and use the ability to work in a team. Each and every one of you at some point will have to work in a team that is constituted of members of diverse backgrounds and abilities. You will very likely not have any choice over your team members. Your success in your chosen career will depend largely on how you are able to work with others around you. In this course, you will be assigned team members to work on class worksheets, labs and problems. You will thus have the opportunity to interact with all your classmates.

Course Content Learning Outcomes
At the end of the course, you are expected to develop quantitative and qualitative understanding of Newtonian Mechanics.
As a successful student in this course, you will be able to:
• Provide detailed and accurate descriptions of Newtonian physical systems.
• Solve multi-step problems in physical analysis.
• Identify pertinent elements of physical systems and problems.
• Design meaningful experiments and clearly report their conclusions.
• Interpret scientific data including the results of experiments designed by others.
• Apply the tools of calculus to the solution of complex problems.
• Use electronic and numerical instruments as tools for investigation and analysis.

Assessment
The above learning outcomes will be assessed in the following ways:

• Weekly Homework: There will be weekly homework assignments. Typically these will be assigned every Tuesday and collected every Tuesday. The solution to these assignments will be posted on the web or given out as handouts as soon as they are collected Tuesday. No late homework will be collected. If you are unable to turn in homework on time, make sure you attempt to do the problems anyway. This will ensure that you are abreast of the material.
  • Homework should be done on standard 8 1/2 x 11 paper.
  • Your name, date and assignment number should be printed on the top right hand corner of the top sheet.
  • All sheets should be stapled together. You can get a small stapler for about $5.00.
  • Each solution/answer should be separated by a line.
  • No credit will be given to a Yes/No answer when the question explicitly asks for an
• Points may be taken off if you do not adhere to the above guidelines.

• **Biweekly Tests:** There will be a test typically every other Friday. This test will be based on the work done in the previous two weeks. **No make-up test will be granted. Test dates are given in the course plan.**

• **In-Class Worksheets:** A lot of key ideas in Physics can be understood only through building mental models and solving problems involving simple physical systems. Throughout the quarter, you may be working either individually or in groups on class worksheets. Some points will be awarded for class worksheets. These points will be added to homework points.

• **Laboratory work:** This is an integral part of the course. Physics is an experimental science and you will learn to design and set up your experiments, record your observations, analyze your data and draw conclusions from it. You are encouraged to work in a group of not more than three students during the laboratory. Laboratory work may be done on any day – there is no specific laboratory session. Instructions for the lab will be given at the beginning of class along with a lab worksheet. Points will be given not only for your recorded data and analysis but also for participation in the experiment. Points may be deducted for untidy work. Laboratory work constitutes 20% of your grade. Attendance is critical since it may not be possible to make up missed experiments due to the pace of the course.

**Final Exam:** Last but not the least, comes the cumulative final exam. This is an opportunity for you to bring together all the skills and knowledge that you have acquired in the course. It is a critical component of your grade. **For this class the final exam will be held on Tuesday, December 13 from 8am to 10am. If there is a conflict with another exam at this time, please inform the instructor at least two weeks in advance.**

**Grades**

Your grades will be calculated as follows:

- **Weekly Homework** 20%  Classwork points will be added to the homework points.
- **Tests** 40% (10% each)
- **Laboratory** 20%
- **Final Exam** 20%

You are encouraged to keep track of your grade during the course by performing the following calculation:

- Add your homework and classwork points and convert to a percentage (HW)
- Add your Test points and convert to a percentage (T)
- Add your laboratory points and convert to a percentage (L)

Then your percentage for the course at any point in the course is 
\((HW \times 0.2 + T \times 0.4 + L \times 0.2) \times 1.25\)

Remember, your percentage for the course as calculated above could decrease as the course progresses since there will be more variables in place (more homework, quizzes, midterm and final). So keep the pressure up on yourself! The final percentage will be calculated as
follows:

\[ HW \times 0.2 + T \times 0.4 + L \times 0.2 + F \times 0.2 \]

where ‘F’ stands for your final exam percentage.

The following table gives the correlation between the % score you calculated and the decimal score.

<table>
<thead>
<tr>
<th>% Score</th>
<th>Decimal Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>86 - 95</td>
<td>3.1 - 4.0</td>
</tr>
<tr>
<td>76 - 85</td>
<td>2.1 - 3.0</td>
</tr>
<tr>
<td>66 - 75</td>
<td>1.1 - 2.0</td>
</tr>
<tr>
<td>56 - 65</td>
<td>0.1 - 1.0</td>
</tr>
</tbody>
</table>

Keep in mind, some aspects of grading are subjective, so the final grade you get in the course may not exactly match what you have calculated above. The instructor reserves the right to assign the final grade based on student performance in written assessments and participation in the class.

A grade of ‘I’ will only be given in emergency situations and only if at least 75% of the work is completed satisfactorily. Note that a grade of “I” cannot be given simply to save a grade point average! There must be a reason for requesting an incomplete grade.

A grade of “P” or “NC” can only be given if requested in writing at the registrar’s office before the deadline printed in the quarterly schedule. Students should know that completion of a course with a grade of “P” is usually not considered completion of a prerequisite for another class.

Students are NOT obligated to tell their instructors when a course is being taken for a P or NC grade!

You can obtain your final grade for the course via touchtone or by using the web. Instructions can be found in the Schedule of Classes.

**Course Objectives**

At a higher level, the course seeks to promote the following skills that are elements of any successful career and lifestyle:

**Critical Thinking:** This is usually described as the process of critically examining the merits of an intellectual endeavor such as a definition, an essay, a poem or a scientific work and arriving at a judgment regarding the merits of that endeavor. It also means using this mode of thought to arrive at a conclusion, or to create new knowledge that will stand up to critical assessment, including experiments, by others. A good critical thinker exhibits the following characteristics:

- He/She recognizes and uses essential components of effective reasoning to evaluate information and to improve the quality of his/her own thinking.
• He/She provides reasons for the conclusions they reach and assess the relevance and
adequacy of those reasons. He/She demonstrates active listening and close reading skills.
• He/She connects past learning with current topics.

You will use one or all of these qualities in almost every activity: specifically in
classwork, tests and laboratory sessions.

Quantitative and Symbolic Reasoning: This is the ability to understand and manipulate
abstract mathematical representations. This includes the following specific skills:

• Value quantitative reasoning,
• Become confident in your ability to reason quantitatively,
• Use quantitative reasoning to solve problems, and
• Use quantitative reasoning to communicate.

This course will help you reach the above goals using general problem solving strategies in
mechanics to understand everyday phenomena.
A person with good quantitative and symbolic reasoning skills exhibits the following
characteristics:

• He/She demonstrates the ability to acquire appropriate and accurate data, to analyze and
summarize this data.
• He/She demonstrates effective case study analysis.
• He/She demonstrates meaningful participation in lecture, discussion, and seminars.

Quantitative reasoning is a campus-wide learning outcome. You will develop this skill
throughout the quarter as you work through numerical and conceptual problems in this course.

Course Policies

Attendance and Participation: Although there are no points explicitly allocated for
attendance, classwork done in class almost everyday will be assigned points. This may
include class worksheets and/or laboratory work. There may also be short pop quizzes at
the instructor’s discretion. Please make attending every class a top priority. If you do
miss a class due to unavoidable circumstances, please contact me as soon as possible and
ensure that you come up to speed with the missed material. This is an intense, fast-
paced course and it is very difficult to make up lost ground later in the course.

Reading Assignments: A detailed course plan will be given to you. It is your
responsibility to read before you come to class. This will help you formulate questions to
ask in class. Typically, each credit hour spent in class requires at least two hours of
work outside of class. Since this is a hands-on, minds-on course, lecturing will be kept to
a minimum in this course. Class time will be utilized for discussions in which students
are expected to be active participants. We will address topics you might have had
difficulty in understanding in the course of your reading, explore everyday applications
of the concepts you learned, solve problems etc. The format of this course forces you to
assume responsibility for your own learning and your final grade and knowledge will
depend directly on your degree of participation.
**No Disruptive Behavior:** In accordance with GRCC policy, students who disrupt the academic atmosphere of the class will be asked to leave and will be referred to an academic dean for further action. Disruptions of academic atmosphere include

- Any behavior that interferes with the ability of faculty or other students to perform the work necessary for this class.
- Comments, discussions, or actions of a racist, sexist, or otherwise degrading nature will absolutely not be tolerated.
- No Food or Drinks in the Classroom: Please refrain from bringing food and drinks in the classroom. A few small spills can lead to a very messy classroom/laboratory.
- No cellphones: Please put your cellphone in ‘silent’ mode while in the classroom as ringing cell phones can be extremely distracting to your classmates.

**Cheating:** Students who are caught cheating will similarly be referred to an academic dean for further discipline. The results of this discipline can range from failing the assignment in question to failure of the class and probation or expulsion from GRCC. Lots of students cheat and most of them do not get caught. However, those that do are in universal agreement that cheating is not worth the risk.

Please keep in mind that you are in college to learn, and if you are cheating you are ultimately only cheating yourself out of learning and skills that you would otherwise take from this class. You don’t need to cheat to pass the class. Don’t do it.

You are encouraged to work in groups on all assignments. However, every piece of work that is submitted for grading must be individual work. For example, if you are asked to solve a problem for homework, you may discuss the strategies to solve the problem with your friends but you must present the solution with all its steps in your own handwriting. Sources must be acknowledged if you use material that is not your own. Failure to adhere to this standard may result in a lower or failing grade for an individual test, paper, or for the entire course.

**Special Needs:** Any student who needs special accommodations because of a disability, needs emergency medical information kept on hand, or requires any other special accommodations to be shared with me in the event of a building evacuation, please contact me at (253) 833-9111 extension 4868. If you need an alternative medium for communicating, or are particularly dependent on any one specific medium, please let me know before class so that appropriate accommodations can be made.

If you believe you qualify for course adaptations or special accommodations under the Americans with Disabilities Act (ADA), it is your responsibility to contact the Disabled Students Services Coordinator in the LSC and provide the appropriate documentation. If you have already documented a disability or other condition, which would qualify you for special accommodations, or if you have emergency medical information or special needs I should know about, please notify me during the first week of class. You can reach me by phone at 833-9111, extension 4868. Or, you can schedule an office appointment to meet me in the SMT Building, office number 229A during my posted office hours or at another mutually determined time. If this location is not convenient for you, we will schedule an alternative place for the meeting. If you use an alternative medium for communicating, let me know well in advance of the meeting (at least one week) so that appropriate accommodations can be arranged.
Phys 201A Syllabus Quiz
Due Tuesday, September 27, 2005

Name____________________
Points: 20

1) When are the meeting times for Phys 201A?

2) When are Chitra’s Office hours? Where is her office?

3) What score (approximately) will be awarded to a student who scores 90% in HW, 80% in Test 1, 75% in Test 2, 90% in Test 3, 85% in Test 4, 90% in Laboratory and 90% in the Final exam?

4) What score (approximately) will be awarded to a student who scores 60% in HW, 75% in Test 1, 70% in Test 2, 80% in Test 3, 70% in Test 4, 60% in Laboratory and 70% in the Final exam?

5) What is the late policy on homework?

6) What is the policy for making up missed quizzes, midterm and experiments?

Acknowledgement of the Syllabus
I have received, read and clarified my questions regarding the syllabus for Phys 201A (Fall 2005). I understand that it is possible that some changes may be made to the syllabus at the instructor’s discretion to suit the pace of the course.

_________________________      _____________________
Student’s Signature       Student’s Name