College Physics

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Office Hours: TWHF 3 – 5 pm and by appointment

Keep This Sheet!

Course Goals:

This course offers many opportunities to:

1) Gain knowledge and understanding of basic physics and physical principles,
2) Gain skill in
   i) reading to identify and extract critical quantitative information,
   ii) applying the principles of physics and mathematics in order to solve problems,
   iii) communicating ideas by use of words and equations, and
   iv) making careful, quantitative measurements of physical processes.

All of these will contribute to the knowledge and abilities necessary for pre-med students as undergraduates, on the MCAT exam, as medical students, and, most importantly, as citizens and professionals contributing to the world.

Course Philosophy:

College Physics is intended to be an introduction to physics for students not majoring in physics. It also fulfills the natural science distribution requirement and is thereby charged with addressing larger questions, as described in the rationale for the requirement passed by the SLU faculty in 1999[1]:

> Our students will be asked to make political and ethical decisions on environmental and technical issues. Their ability to make sound judgments on such issues depends in part on an understanding of mathematics, natural law and scientific endeavor. It also depends on appreciating the ways by which science and technology influence society and are influenced by society.

The explicit requirements for a natural science distribution course set forth in this document are:

1. Develop an **awareness of the variety and richness** of natural phenomena and, insofar as possible, relate them to everyday experience;
2. Provide a **theoretical and quantitative understanding** of the processes underlying natural phenomena;
3. Provide **a sense of how scientific knowledge is obtained,** either through the historical study of its development or by the examination of the experimental or observational evidence upon which it stands.

Laboratory Component:

The laboratory time is an opportunity to interact with the physical universe by performing simple experiments designed to illustrate specific principles of physics and methods of data analysis. Though there is some necessary disconnection between lecture on the theory of physics and the reality of the lab[2] due to scheduling complexities, it does provide us the opportunity to work out how physicists figured out the theories in real laboratories much like ours … and many much cruder.

[1] Curriculum Revisions, Part II passed on 5/18/99, copies available in the Registrar's office.
[2] In Bewkes hall, miniature black holes from the Big Bang can float through the laboratory result in nonsensical, spurious results in experimental data.

GRADING:

ATTENDANCE: Required to succeed for most students.

HOMEWORK (20%): Homework will be assigned at most class meetings for discussion and submission during the next class. There are three categories of homework that require different approaches:

I) READING:

Can't be explicitly graded, but will show up in class participation.

II) WRITING:

Conceptual Questions assigned as homework and laboratory reports.

III) PROBLEM SOLVING

PROBLEM SOLUTIONS MUST READ AS EXPLANATIONS OF IDEAS

… not as records on an accountant's ledger. Each problem solution will be graded on a **20 point** scale according to the following criteria:

CATEGORY	POINTS possible	POINTS earned
Statement	2	
Diagram	5	
Laws	2	
Algebra	6	
Calc. & Ans.	5	
TOTAL	20	

- 2 pt. **Statement** of the problem
- 5 pt. Appropriate **diagram**(s)
  - showing the situation or event(s),
  - labeled with symbols for the various physical quantities, and
  - the coordinate axes used

  (If no diagram is appropriate, the homework problem will be worth only 15 points.)
- 2 pt. Statement of the **general physical law** to be used (*e.g.* NSL: $\vec{F} = m\vec{a}$)
- 6 pt. ***ALGEBRAIC*** solution for the quantity of interest **NO NUMBERS SUBSTITUTED!!**
- 5 pt. Substitution of **numbers, calculation** and correct numerical **answer with UNITS**

Homework will be counted into the final grade as the equivalent of two exams.

QUIZZES (10%): To keep you up with the class and require reflection on lab work.

EXAMS (50% = 10+10+10+20): The exams are intended to intensify your studying, encourage you to review, get you to step back for an overview of the material, and learn something new during the exam. See the calendar for dates of the exams. Grading will be in the style described for homework (except that the statement of the problem will not be required). The total number of points available on an exam will vary. The final will be cumulative and count for two exams.

LABORATORY (20%): Successful completion of the laboratory component of the course is required to pass the course. It will figure into the grading scheme as equal to one exam.

THE FINAL GRADE will be a simple average of all of the above grades, dropping the lowest according to

4.0	3.5	3.0	2.5	2.0	1.5	1.0	0
>94%	88% - 93%	82% - 87%	76% - 81%	70% - 75%	64% - 79%	55% - 62%	< 55%

with the instructor's subjective freedom for the treatment of borderline cases!