

Physics 108 Course Syllabus, Summer 2009

INTRODUCTORY APPLIED PHYSICS LAB: ELECTRICITY, MAGNETISM, OPTICS, AND MODERN PHYSICS <http://www.physics.byu.edu/faculty/campbell/physics108>

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Objectives: Physics 108 is a lab designed to support the Physics 106 lecture. Hopefully, the experiments presented here will develop a greater conceptual understanding of electricity and magnetism, optics, and modern physics. You probably don't have a great deal of experience with electrons, field lines, focal points, or particle emission, which makes Physics 106 rather challenging. Our intent is to provide experiments that will further illustrate these concepts, and do so in an interactive small-group environment.

Adds and Drops: Adding and dropping (including sections changes) are done by computer through the entire add and drop period. Please be aware of the fees associated with such changes. We request that you make needed changes as early as possible so that other students can get into the class.

Preparing for the lab: Read each lab before coming to class. Review the physics involved and get a general idea of what you will do. In the manual you will find an answer sheet for each lab. On that sheet there is a space to write an overview paragraph about the lab. Be sure to complete this before you come to class. This exercise ensures that you are prepared to make optimal use of your time in the laboratory. In the overview, we are looking for a good conceptual understanding of what physical principles that the lab is supposed to illustrate, even if you don't yet understand how all the equipment works. Note that we are not looking for a restatement of the procedures provided in the lab description.

At the beginning of each lab: You should be organized into groups of two or three (at most) lab partners. It is better to have two groups of two than one group of four. Your group will work together to perform and discuss each experiment, though you will perform your own analysis and write your own lab report as individuals. At the beginning of the lab period, the TA will initial your overview paragraph. Don't let them forget -- your grade depends on it. Your TA will also explain how your lab equipment works and how to use it correctly, but will not spend much time covering the physical principles involved, since you will already have reviewed them before arriving.

During the lab: We don't want you to feel hurried. It's hard to think creatively or carefully, or to enjoy learning if you're feeling pressured. Attention will be paid to the quality of the work that you do perform, and how earnest your effort is. If you do not complete your lab, but you have been making an honest effort (your TA will know!) it will not affect your grade. If you do not complete the lab and you have been goofing off, it will affect your grade. There is always plenty to do, and we expect you to use the entire lab period wisely. If you arrive late, leave early, or simply waste time, it

will hurt your grade. During the lab period, your TA will score and record your participation points on your lab sheet and on his/her attendance roll.

Lab reports: The report is informal and hand written. If you concentrate on the quality of what you write, you shouldn't have to write too much. Keep your reports concise and focused. Avoid redundancy -- focus on your results and their interpretation rather than regurgitating the procedures. Present data clearly -- always properly label graphs and tables, and include units with any measured or calculated quantity. Describe your measurements, observations, results and interpretations in your own words -- don't assume that the meaning is obvious. You should generally have time to complete your lab report during the lab period, including the associated answer sheet, if you write it as you go. Always be sure to write your name, date, lab title/#, section number, and TA's name in the header of each lab report. Your grade on the lab will consist of the following four parts:

(A) Preparation (3 points): Student read the lab description and is familiar with its content before arrival, and double-checked the instructions before asking questions about procedure. Overview section is well written and demonstrates an understanding of each of the primary physical concepts relevant to the lab.

(B) Participation (3 points): Student is punctual, follows instructions, participates actively in group discussion, contributes well to the actual experiment, and cleans up his/her work area before leaving.

(C) Measurements/Analysis (3 points): Student collects and records careful data and analyzes it correctly, displaying units on all numerical quantities, and properly labeling all graphs and tables.

(D) Results/Discussion/Conclusions (3 points): Student presents results clearly, explains in his/her own words what data (e.g. graphs and tables) reveal, provides insightful observations and commentary on their interpretation in terms of physical principles, expounds the relationship between the lab experiment and related physical systems encountered outside the lab, and offers a reasonable explanation for any obvious errors.

For each section of the report, a score of 3 is full credit, and indicates that you have done everything expected with only minor problems. A score of 2 means that your work was substantially deficient. A score of 1 means that your work is seriously incomplete or misguided. A score of 0 indicates the lack of a serious attempt. When the graders do not award full credit to your work, they will provide an explanation.

The role of the TA: Your TA will help you to understand and use the equipment provided, and will help you to solve problems encountered along the way. Experiments seldom go as planned, and technical difficulties are the norm. But when you don't understand your results or the associated physics (and that may be most of the time), we insist that you discuss and analyze the matter together as a group before calling on your TA for guidance. Take your time to talk it over. Consult your text. Even go to other teams for ideas and clarification. Your TAs have been trained not to answer physics questions too readily, though they are available as a last resort.

At the end of each lab: Lab reports must be submitted to the TA at the end of each lab period. As you leave, check to see that your participation points have been recorded on the TAs attendance roll, and respect the TAs judgement if you have lost participation points for coming late, leaving early, wasting time, etc. A separate team of graders will grade the remainder of your report between lab

periods. Your graded report should be available at the beginning of the next class period. If you complete a lab (as evidenced by the TAs attendance roll), but forget to submit your report before leaving, you will lose a participation point when the lab is graded the following week.

Written papers. You are required to write two short application papers. See the course schedule for due dates. Each paper should be roughly 2 pages long, double-spaced, with one-inch margins and 12-point font, and should describe an application of the principles of physics demonstrated in one of the labs completed during the weeks prior to the due date. Please limit the scope of your paper to the principles covered by a single lab. Each paper will be graded on a pass/fail basis. The papers should be well written, grammatically correct, logically organized and conceptually coherent. If a paper is judged to be unacceptable (due either to poor writing or bad physics), you can revise it and resubmit both the original paper (complete with TA comments and grade) and the revised paper to your TA for a second try. But the revision must be received by the last day of the semester before reading days begin.

Final grades: Each of the 11 labs is worth 12 points. Each application paper is worth 6 points (6 for pass, 0 for fail). This permits a total of 144 points to be earned. Final grades will be determined by a rather demanding percentage scale.

Score	97%	94%	91%	88%	85%	82%	79%	76%	73%	70%	67%
Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-

While it is relatively easy to get full credit on individual labs (recall that full credit merely indicates the absence of serious deficiencies) it is not easy to earn an overall *A* grade in the course, which requires that you accumulate no less than 140 points. We feel that an *A* grade should indicate that a student is rarely, if ever, "seriously deficient". Also observe that missing even one lab will lower your final grade by at least two levels.

Online score tracking: Your scores can be accessed from the course website, which will require you to identify yourself by providing your CID (class identification number) and the last 4 digits of your BYUID. While we will not use Blackboard extensively in this course, there will be a link to the course website in Blackboard. When you notice problems with your posted scores, don't hesitate to contact the administrative TA. But note that it usually takes a full week after you submit a lab to get it graded and an additional three days to get your scores posted online. Please don't email us about a missing score until at least this much time has passed.

Regrading: When you lose points for deficient work, you will not generally be permitted to repair the problems with your lab report for a higher grade. We do, however, permit regrading requests on the first two labs of the semester. To request regrading for Labs 1 or 2, obtain a "Regrading Request" form from your TA, fill it out, have your TA sign and date it, and attach it to the first page of the lab to be regraded. Also make sure that the request form is easy to see from the outside since the graders won't otherwise know to be watching for it.

Making up missed labs: We will permit make-up labs twice during the semester (see the course schedule for details). The first make-up session will only include labs from the first half of the course, and the second make-up session will only include labs from the second half of the course. To attend a make-up lab session, you must first make a formal request for a specific lab on the make-up lab sign-up sheet in the lab room, which tells the equipment staff to have the correct equipment ready for you on the specified date. If you forget to make a formal request, you may get lucky and find that someone else has requested the same equipment -- or not. Note that you will only be allowed to make up one lab during each makeup session (unless you have explicit permission from the

administrative TA or the supervising professor), and that you may not make up a lab that you have already completed previously.

Attending other sections: If you must miss a lab due to a special (i.e. very infrequent) emergency such as work, being out of town for a performance or interview, family emergencies, or illness, you are allowed to attend another lab section performing exactly the same experiment. But this option cannot be used regularly or under ordinary circumstances. Furthermore, this special option requires the consent of the TA in the other section (who may turn you away if there is no room). When attending another section, submit your report to the TA in the section that you actually attended (not the one you usually attend). Your lab sheet will be returned to your normal section after it has been graded.

Course evaluation: We encourage you to submit course and instructor evaluations on Route-Y during the evaluation period at the end of the semester. Since this is a laboratory class that is actually taught by a TA rather than a faculty member, the target of the instructor evaluation is generally assumed to be the TA who taught your section.

Honor Code Standards: In keeping with the principles of the BYU Honor Code, students are expected to be honest in all of their academic work. Academic honesty means, most fundamentally, that any work you present as your own must in fact be your own work and not that of another. Violations of this principle may result in a failing grade in the course and additional disciplinary action by the university. Students are also expected to adhere to the Dress and Grooming Standards. Adherence demonstrates respect for yourself and others and ensures an effective learning and working environment. It is the university's expectation, and my own expectation in class, that each student will abide by all Honor Code standards. Please call the Honor Code Office at 422-2847 if you have questions about those standards.

Harassment: Harassment of any kind is inappropriate at BYU. Specifically, BYU's policy against sexual harassment extends not only to employees of the university but to students as well. If you encounter sexual harassment, gender-based discrimination, or other inappropriate behavior, please talk to your professor, contact the Equal Employment Office at 422-5895 or 367-5689, or contact the Honor Code Office at 422-2847.

Disabilities: BYU is committed to providing reasonable accommodation to qualified persons with disabilities. If you have any disability that may adversely affect your success in this course, please contact the University Accessibility Center at 422-2767. Services deemed appropriate will be coordinated with the student and instructor by that office.

Children in the Classroom: The serious study of the physical and mathematical sciences requires uninterrupted concentration and focus in the classroom. Having small children in class is often a distraction that degrades the educational experience for the entire class. Please make other arrangements for child care rather than bringing children to class with you. If there are extenuating circumstances, please talk with your instructor in advance.