Physics 240  
Design, Fabrication, and Use of Scientific Apparatus  
Fall 2009

Instructor:  
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Office hours: 1:00–1:50 MWF or by appointment

Section 1: TuTh 8:00-10:50 AM  
   Room: C435 ESC  
   TA: Quinn Norris  
       Joseph Nelson

Section 2: TuTh 1:00-3:50 PM  
   Room: C435 ESC  
   TA: Thomas McConkie  
       Michael Rawlins

Section 3: TuTh 4:00-6:50 PM  
   Room: C435 ESC  
   TA: Jayrin Farley  
       Michael Rawlins

Course Objectives: In this course you will gain experience in the following

1. Designing, building, and interfacing experimental apparatus.
2. Problem solving in complex physical/electronic systems.
3. Making involved physical measurements and analyzing experimental results.
4. Documenting in your lab notebook your procedures and methods – your results and analysis.
5. Presenting your work in writing and through oral presentations.
6. Follow professional ethics guidelines in research activities and presentation of results.

Time in the course  
This course is a 2-credit class. It is expected that you will invest approximately 12-16 hours/week in the class during a term. Most of this time will be in the scheduled lab period. The small remainder is expected to be spent out of class time in preparation for coming labs or completing writing assignments.

Course materials  
All the course materials are available on the course web page:  
or by following the “Course Web Pages” link on the department home page. Hardcopy versions of most handouts will be available in the classroom.

Course grading policies  
This list shows the approximate weighting for grades. It may be adjusted as the term develops:

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\text{Graded activity} \quad \% 
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Attendance at all class sessions 20
Lab projects and reports 40
Formal superconductivity report 10
Group project and presentation 20
Professionalism 10

Absences and coming late
On time attendance at all scheduled class times is required. This is particularly critical in this class where you will be working as partners. If you want special consideration for an emergency that keeps you from participating in class, you must notify the instructor before the event, if at all possible. If you do need to miss a class period, you will be required to repeat, out of class, the part you missed. In some cases this may not be possible and you will miss credit. Phone or email messages are both considered adequate prior notification.

Late assignments
Any assignments given are due at the beginning of class on the day indicated on the schedule (which is subject to modification). Late assignments will lose 5% for each day or portion of a day late.

Written assignments
Though you work as partners, all writing is to be done individually.

1. Lab notebook on temperature measurement.
2. 2-page report on temperature measurement.
3. Lab notebook on controller design.
4. Lab notebook on superconductivity measurements.
5. Formal report on superconductivity measurements.
6. Lab notebook on noise and lock-in amplifier measurements.

Handouts will be given out in class with details on these assignments.

Oral presentation
You will give a 15-minute group oral presentation about your student-designed group project. This presentation will be given during the scheduled final exam period for your section.

Professionalism
Everyone will start out with full credit for professionalism. You can lose that credit by unprofessional behavior such as nagging the TA over trifling grading issues or by allowing your lab partner to do all the work while you watch. It is not expected that you just accept errors or perceived inequities in the grading or class procedures, but it is expected that you will bring those problems up in a professional manner.

Academic Honesty
The first injunction of the BYU Honor Code is the call to be honest. Students come to the university not only to improve their minds, gain knowledge, and develop skills that will assist them in their life’s work, but also to build character. President David O. McKay taught that “character is the highest aim of education” (The Aims of a BYU Education, p. 6). It is the purpose of the BYU Academic Honesty Policy to assist in fulfilling that aim. BYU students should seek to be totally honest in their dealings with others. They should complete their own work and be evaluated based upon that work. They should avoid academic dishonesty and misconduct in all its forms, including but not limited to plagiarism, fabrication or falsification, cheating, and other academic misconduct.

Honor Code Standards
In keeping with the principles of the BYU Honor Code, students are expected to be honest in 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 any questions about those standards.

**Preventing Sexual Harassment:**
Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds. The act is intended to eliminate sex discrimination in education. Title IX covers discrimination in programs, admissions, and student-to-student sexual harassment. BYU’s policy against sexual harassment extends not only to employees of the university but to students as well. If you encounter sexual harassment or gender-based discrimination, please talk to your professor; contact the Equal Opportunity Office at 422-5895 or 367-5689 (24-hours), D285 ASB; or contact the Honor Code Office at 422-2847, 4440 WSC.

**Students With Disabilities**
BYU is committed to providing a working and learning atmosphere that reasonably accommodates qualified persons with disabilities. If you have any disability that may impair your ability to complete this course successfully, please contact the Services for Students with Disabilities Office (1520 WSC, 422-2767). Reasonable academic accommodations are reviewed for all students who have qualified, documented disabilities. Services are coordinated with the student and instructor by the SSD Office. If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established grievance policy and procedures by contacting the Equal Employment Office at 422-5895, D285 ASB.

**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.