Suspected violations of the Honor Code will be referred to the Academic Honor Board. For a full description of the code and
what constitutes a violation of the code, refer to the Goucher Handbook or online at
www.goucher.edu/documents/General/AcademicHonorCode.pdf

Dr. Ali Bakhshai
GOUCHER COLLEGE
Department of Physics

Syllabus for Intermediate Physics Laboratory (PHY230-Fall 2010)

Office Location: **HS-G10C**
Office Hours: **TU: 10:00-11:00**
W: 12:30-13:30
TH: 12:00-13:00
F: 11:30-12:30

Purpose of the course: To understand the historical significance of some of the major discoveries in the world of physics by repeating these experiments and following the steps described below for each of the experiments. Key learning goals for this course include; 1. Acquire a propensity to look beyond "common sense' solutions and to apply critical thought to problems, 2. Construct models and realize the limitation of those models, 3. Communicate with clear and concise expression.

- **Step 1 (Introduction: Literature Search, History, post & pre Lab presentation to the class):** Finding out comprehensive background information about the experiment including, biography of the discoverer, date and time, method, circumstances, it's effects in scientific and general communities, challenges, rewards, historical significance of the discovery, etc.
- **Step 2 (Material & Methods including Data Collection):** Complete description (maker, model) of the apparatus including all parts of it and all the equipment needed to run it. How to run the apparatus and collect meaningful, accurate and careful data for the inputs and outputs**.**
- **Step 3 (Results & Discussion, Tabulated Data, and Data & Error analysis):** Presenting the Raw data in tabulated form with proper units. Applying theory and showing all steps of the calculations of the necessary parameters. Producing necessary graphs and calculations using the collected raw data and discussing the significance of the results.
- **Step 4 (abstract):** writing an executive summary of all steps of the experiment; an accurate and concise description of the entire lab in one paragraph.
- **Step 5 (Writing the lab report and submitting a digital copy):** completing the lab report with the proper formatting as demonstrated in the sample lab report on Course BB site under Assignments Tab.

List of the experiments:

1. **e/m**
2. **Hall Effect**
3. **Speed of Light**
4. **Muon**
5. **Stefan-Boltzman**
6. **Planck's constant**

7. **Millikan's oil drop**
8. **Frank-Hertz**
9. **Spectroscopy (Balmer series)**
10. **Davison-Germer**
11. **Two slit interference**

Weekly activity:

The steps described above for each lab will be assigned to students as listed in the weekly assignment table. Each student will have a different step assignment for next labs until all students go through a complete rotation. Step 1 (Literature Search) shall be done prior to the scheduled lab day. The student who is assigned for step 1 need to finish the assignment and electronically share it with the class before 6 pm on Monday prior to the scheduled lab on Tuesday. Also this student will use the first 15 minutes of the lab period from 12:15-12:30 to present the report to the class. The student who is assigned for step 2 (material & methods) needs to follow the introduction of the laboratory instrumentations by the instructor and make necessary notes (12:30-1:00). The student who is assigned for step 3 (Data Collection) will be the person responsible for running the apparatus and collecting the data from 1:00-2:15. Student who is assigned for step 3 will help all other students to collect individual data sets to be included in Results & Calculations. The student who is assigned for step 4 (Results & Calculations) will be the person responsible for getting the data from each student and constructing appropriate graphs including error bars and calculations with error analysis to reach a conclusion from 2:15-3:00. All students will help in this step and it can be done simultaneously with step 3. The student who is assigned for step 5 will be the person responsible for presenting the results to the class at the begging of the following lab session from 12:00-12:15 and send the report to the class electronically for review before submitting it to the instructor. The student who is assigned for step 5 will be the leader of the group for that lab and will collect the reports from the steps 1 through 4 and create a final report with the format of the sample lab that is posted on the Blackboard.

Grading:

Each student will be given a numerical grade based on the performance for his/her step separately each week. The average of the 11 lab grades will count as 75% of the total grade for the course for each student. There will be a practical exam at the end of the semester. Each student will pick a lab based on a random draw from the 11 labs to conduct, complete with results, and demonstrate to the instructor. No lab report is needed for this practical exam. The practical exam grade will count as the other 20% of the total course grade. The class participation, asking questions from the presenter will count as 5% of the total course grade. Only one excused absence can be made up otherwise the grade will be zero (0) for the missing lab. Unforeseen circumstances will be dealt with in case by case bases.

Grade Limits

92-100	A
89-91	A-
86-88	B+
82-85	B
79-81	B-
76-78	C+
72-75	C

69-71	C-
66-68	D+
62-65	D
59-61	D-
<= 58	F

GENERAL RULES:

Attendance: In order to participate effectively, you should attend class faithfully and keep up with daily assignments. **If you regularly cut class I reserve the right to lower your grade accordingly**. YOU ARE RESPONSIBLE FOR ALL INFORMATION PRESENTED IN CLASS, EVEN THOSE YOU MAY HAVE MISSED!

In the event of a drastic change in your circumstances (such as illness or job reassignment), I will make every effort to provide an accommodation that assures you an opportunity for successful completion of the course.

If at any time, for any reason, you decide to leave the course, please remember to withdraw officially. Otherwise College regulations require that I report an F grade for you.

Conferences: I am eager to help you succeed in this course. If you need assistance, of if you just wish to discuss some aspect of the course fully, you should feel free to meet with me. My office hours are posted on the office door. If those times are not convenient for you, we can make an appointment for another time. Whether you plan to just drop by during office hours or have an appointment, it is always a good idea to remind me, before or after class—or through the Voice or E-mail, that you wish to confer with me.

If you are late for class: Come to class if 30 minutes or more remain in the period, otherwise the distraction caused by your late entrance is probably not offset by what you might learn in the brief time remaining. If less than 30 minutes remain in the period, stay away, borrow notes from another student, and be punctual next time. If there is a reason why you will necessarily be late on a recurring basis, please discuss it with me in advance.

If you must leave early: Please alert me before class begins. You can reduce the distraction for your instructor, if not for the rest of the class, by providing advance warning.

If I am late for class: My apologies. If I am not present you may leave 15 minutes after the class is scheduled to begin, unless you receive other instructions (such as a class cancellation posted on or near the classroom door, or an announcement by a secretary, TA, work-study student, of faculty member that I am on the way and will be there in time to salvage enough of the period to justify a slightly longer wait).