Syllabus for Post-Bac Physics-II (PHY543-Spring2011)

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

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

TEXT: College Physics, Serway & Vuille, Thomson Publishing, 2009, 8th Edition.

Week No.	Date		Topics	Ch	Homework Problems
1	1/25-1/28	W TH F	Vibrations & Waves Lab-1 (velocity of wave in a string) Ch-13 continued	13	66,69,71,74,77
2	1/31-2/4	W TH F	Sound Lab-2 (speed of sound in air) Ch-14 continued	14	64,66,71,73.74
3	2/7-2/11	W TH F	Electric Fields & Forces Lab-3 (mapping electric field lines) Ch15-continued	15	52,53,55,57,61
4	2/14-2/18	W TH F	Electrical Energy & Capacitance Lab-4 (capacitance) Ch16-continued	16	57,60,61,63,65
5	2/21-2/25	W TH F	Current & Resistance **Test-I (chapters 13-15)** Ch17-continued	17	57,59,64,65,67
6	2/28-3/4	W TH F	DC circuits Lab-5 (Kirchhoff's rules) Ch18-continued	18	47,52,61,65,67
7	3/7-3/11	W TH F	Magnetism Lab-6 (magnetic forces) Ch19-continued	19	64,66,69,71,76

8	3/14- 3/18 *	W TH F	Spring Break		
9	3/21- 3/25	W TH F	Induced Voltages & Inductance Lab8: (building ammeter & voltmeter) Ch20-continued	20	57,59,61,65,66
10	3/28- 4/1	W TH F	AC circuits **Test-II (chapters 16-19)** Ch21-continued	21	
11	4/4- 4/8	W TH F	Ch21-continued Lab-9 (RLC circuits) Ch21-continued	21	72,73,74,75,76
12	4/11- 4/15	W TH F	Reflection & Refraction of Light Lab-10 (reflection & refraction) Ch22-continued	22	44,48,54,56,59
13	4/18- 4/22	W TH F	Mirrors & Lenses Lab-11 (lenses) Ch23-continued	23	54,57,60,62,63
14	4/25- 4/29	W TH F	Wave Optics **Test-III (chapters 20-23)** Ch24-continued	24	61,68,70,71,73
15	5/2- 5/5 *	W TH F	Nuclear Physics Lab-11 (Spectroscopy) No class on Friday	29	42,45,46,53,54

Due Dates: **Homework** are due every **Wednesday** following the completion of the chapter
Quizzes are due every **Friday** following the completion of the chapter
Lab Reports are due every **Thursday** after completion of the lab work.

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DEPARTMENT OF PHYSICS
PHY542 (Post-Bac Physics-I)

COURSE OBJECTIVES:

Physics is an experimental science of nature. Through observations physicist try to put the behavior of the world around us in more understandable or predictable way. The key learning goals which students are expected to do after they have completed this course include; **1. Extrapolate and apply current knowledge to new situations, 2. Synthesize and integrate conceptual information and mathematical skills, and 3. Construct arguments using a logical progression of steps from premise to conclusion. In general the main goal of this course is to improve and expand your logic reasoning and analytical thinking ability by introducing you to concepts of kinematics and dynamics of motions for point mass, extended mass, fluids, oscillatory and wave.** Direct measures of how well students have learned this include**; 1. short-answer conceptual questions in class (clicker questions), quizzes, and tests. 2. homework problems, complex problems in quizzes and tests, 3. Lab experiments and written reports.**

Physics 542 is the first semester of a two-semester sequence in Principles of Physics oriented particularly toward Life Sciences. The course is a pre-calculus-based with extensive use of algebra and plane trigonometry. We will discuss basic principal ideas of physics and formulate mathematical models that can be used to solve problems. Much effort will be made to develop an intuitive understanding of these ideas and how to derive equations to describe them.

A Metaphor: *"In this course, doing the reading, coming to class, and doing homework are like practicing for something like a soccer team. The instructor is less a source of information and more a coach who structures practice and sets standards. Moreover, participants progress not by absorbing information but rather by practicing the skills individually and learning to work effectively with others. The exams are like league games where students test their skills in a situation where performance counts. In this approach, the instructor is not so much the students' evaluator as an ally in helping them develop their strengths." Thomas A. Moore, McGraw-Hill,* Six Ideas That Shaped Physics.

LABORATORY EXPERIMENTS:

There will be about 11-12 laboratory experiments for the semester. You are required to write laboratory-report for each of the experiments and turn it in by Thursday following the lab. Your lab grade for the course will be the average of grades for the individual lab-reports. There will be no exam for the lab portion of the course. Only one **excused** absence from a laboratory can be made up at the end of the semester. One of the most valuable aspects of the laboratory reports is practice in performing an experiment and then organizing the results and presenting them in a concise written report. Neatness and organization are extremely important in the report. Reports that are impossible to follow will be returned to be rewritten.

The whole idea of a laboratory report is to describe what you have done and the conclusions you can draw from your results. While it is not necessary to develop the theory behind the experiment in great detail the report should be written so that a person familiar with basic physics and slightly familiar with the experiment could read your report and see what you have done, what results you have obtained, what conclusions you have drawn, and how you have justified those

conclusions based upon your results. It must be clear what every number represents and why each result, graph, etc., is significant.

The following sections should be in a report:

- **Title** - name of the experiment
- **Statement of Purpose** - what do you hope to accomplish in this laboratory?
- **Introduction** - information related to the topic of the laboratory. These are usually what you have studied in lecture sessions before the laboratory experiment.
- **Material & Methods** - a step-by-step repeat of the laboratory instructions is not necessary, but you should note anything in particular which you feel might have affected your results.
- **Results & Discussions** - data presented in tabulated form with proper unit and uncertainties in measurement. Include your calculations of the related parameters in the experiment.
- **Conclusion** - refer back to the Statement of Purpose. Did the experiment accomplish what was intended? What basis did you have for your conclusions?

Length of the lab report: Minimum typed three pages single-spaced plus tables and charts.

The report should be minimum 3 pages long and should be done by word processing and spreadsheet software.

NOTE: (It is proven that using "Discover" method for labs is more effective learning for students. So we will explore this by trying to do a few of the labs using "discover" method and the others using the traditional "Verify" method. The "verify" method is very useful for learning data analysis skills and basic laboratory skills.)

HOMEWORK:

A homework set of about 5-10 problems per chapter will be assigned each week. The homework for each chapter will be due by **Wednesday 1:30 pm** in class following the completion of the chapter. They will be graded and returned to you on the following **Friday class-time**. **No late homework will be accepted**. Worked out solutions to the assigned problems will be posted on the course Blackboard site after the problems are due.

Probably 12-14 homework sets will be assigned during the semester. The average of homework grades will count as an HOUR examination.

EXAMINATIONS:

There will be **three** hour-examinations. You are allowed to bring a 5x7-index card to the examination with any equations you want to write on it. No examples or problem solutions and no drawings of any kind are allowed on the equation card. Including the average homework grade, there will be **four** grades. Best **three** grades will count toward the course grade.

The grade in the course will be based upon examinations, laboratory reports, and homework. **There will be no make-up examinations**. One excused absence from an hour examination will be the one is allowed to drop. Except in unusual circumstances, two missed examinations will result in failure of the course. Cheating on examinations or in any other phase of the course will result in automatic failure of the course.

Chapter Quizzes: there will be an online (blackboard.goucher.edu) quiz for each chapter. It will be available right after the completion of the chapter discussions in class and will be due on the **following Friday**.

NOTE: Quizzes are individual responsibility and no resources other than a calculator, scrap papers, pens/pencils, and an equation-card is allowed when taking the quizzes. Just remember that you are under Goucher Honor-Code when taking quizzes.

In summary, the total course grade will be based upon the following:

Quizzes	**10% of the total course grade**
Homework	**10% of the total course grade**
Three Mid-semester tests	**40% of the total course grade**
	[Each test will include: 30% multiple choice (partial credit could be earned if solutions are handed in) similar to Clicker questions, 40% problems similar to quizzes, and 30% problems similar to the homework]
Final exam	**20% of the total course grade**
Laboratory Reports	**20% of the total course grade**
Total	**100%**

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!

No Electronic submissions of any Homework, Labs, Tests, etc, will be accepted.

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).