PHYSICS 22000 LAB SYLLABUS

SPRING 2016

Faculty:

Prof. Thomas Moffett – room PHYS 244, tmoffett@purdue.edu

Textbook:

College Physics, Volume One, Eugenia Etkina, Michael Gentile, Alan Van Heuvelen, Pearson, 2014.

Lab Coordinator:

Dr. Andrzej (*Andrew*) Lewicki - room PHYS 142, lewicki@purdue.edu

Lab Manual:

Physics 21800 and 22000 Laboratory Manual, 2015/2016, Andrzej (*Andrew*) Lewicki and Michael Zimmer, LAD Custom Publishing, 2015.

Welcome to **Physics 22000** laboratory. This semester, you will explore the fundamental concepts of mechanics by performing experiments, collecting data and analyzing your results. Physics 22000 laboratory is not a separate course. It is a component of Physics 22000 course.

General description:

Labs meet in **room PHYS 121** in the Physics Building. The exact schedule of experiments is located at the end of this lab syllabus.

The **Lab manual** (***Physics 21800 and 22000 Laboratory Manual, 2015/2016,*** Andrzej Lewicki and Michael Zimmer, LAD Custom Publishing, 2015) is available in local bookstores. Do not buy any previous editions of the lab manual! The same lab manual is used by Physics 21800 and by Physics 22000 students.

Students who completed Physics 22000 lab last year may claim the previous credit for the lab. The minimum requirement for the credit transfer is to have all experiments completed and have the number of points for the lab equal to at least 75% of the perfect score. To transfer your old lab score go to the **lab coordinator** with your Purdue ID no later than at the end of the second week of classes.

Lab reports are usually due at the beginning of the next experiment. For the exact dates, see the **lab schedule** at the end of this syllabus.

Always bring a calculator with you to the lab**. Do NOT bring drinks or food to the lab!**

The **help center** for Physics 22000 is located in **Room 11A** of the Physics Building. The help center schedule is available at the following address:

http://www.physics.purdue.edu/academic-programs/docs/help_centers/HC218220.pdf

Lab procedures:

Before coming to lab, you must answer all prelaboratory questions scheduled for that week. These questions are closely related to the activities and measurements you will do in lab. The prelaboratory questions typically require 20-30 minutes of effort. The prelaboratory questions are your individual work, so everyone is expected to complete them. **The prelaboratory questions must be answered on-line (except of make-ups)** using the ***MasteringPhysics*** (the same online software as you going to use for homework assignments - https://portal.mypearson.com/mypearson-login.jsp). If you exceed the number of allowed attempts for a prelab question, then you would not get credit for that question. In other words, no partial credit above the allowed number of attempts. **The deadline for prelaboratory questions is on Tuesday 9:30 AM for all lab sections**. No credit for late prelaboratory questions.

The prelaboratory questions must be completed and submitted **individually**. The lab reports from the lab make-ups must be submitted as individual reports (no group lab reports for make-ups).

During the two-hour laboratory period, you will observe phenomena, manipulate the lab apparatus, collect data and ask questions. Be on time for the lab. Remember to **sign the lab attendance list**! Your lab TA will briefly review the theory behind the experiment and describe the lab equipment to be used. **Before leaving the laboratory room, make sure that your TA has initialed your data sheets**. The minimum penalty for lab reports without TA's initials is 2 points. TA may even refuse to accept lab reports without initials.

In the lab, you will work with a lab partner. All experimental **data must be written in ink** on your data sheets. TAs have been instructed not to initial data sheets written in pencil. On data sheets you will find a pair of parentheses with an empty space in between: ( ). You are required to write appropriate **unit** in that space, e.g., (*m/s*). Results without units are not complete!

During the week that follows each lab experiment, you should type the answers to the two **Conceptual Questions** located at the end of each experiment (after the data sheets). Usually, you will not find the answers to conceptual questions in the lab manual. Instead, you should search textbook, other books available in libraries and online resources. However, keep in mind that "copy and paste" method is not allowed! You are encouraged to

search answers wherever you like, but you have to write answers in your own words. Simple "copy and paste" from internet will lead to a penalty.

In addition to answering Conceptual Questions, you are asked to write (type) a short **discussion of physics concepts related to the experiment**. Briefly describe major physics principles, concepts and formulas that were applied or illustrated in this experiments. You should write how these concepts and physics principles apply to the measurements done this week. Do not simply write a report of what you did in the lab. Instead, focus on the concept summary, i.e., the message that should be remembered from this experiment. If the experiment included testing formulas, then discuss predictions of the formula with changing conditions (for example, explain how the results would change with an increase of velocity or decrease of the moving object mass, etc.) The whole text should not exceed one page and is due at the beginning of the next experiment.

Group lab reports are allowed (but not required) this semester. It means that only one lab report for you and your partner is required. Obviously, the same credit will be assigned to both lab partners. **However, if a lab report is not ready on time, the penalty will apply to both students, regardless of who caused the delay**. The cover sheets are located at the end of the lab manual. If you prefer to submit individual lab reports, you are always allowed to do that. Just tell your lab TA about your decision. The attendance will be taken at each experiment. Please, make sure to **put your signature on the attendance list**.

ITaP is enforcing **print quota** on all printers connected to the ITaP network. Please be aware of your balance and print responsibly. All printouts required in the lab are part of your print quota.

Grading practice:

Each laboratory report (including prelabs) is worth up to 12 points. We have ten labs scheduled for this semester (10 labs*12 points = 120 points). Since the maximum number of points for the lab portion of Physics 22000 is not 120, the total lab score will be multiplied at the end of semester by a normalization factor. The score of 120 points for the lab (the perfect score) will translate into max. points allowed for the lab this semester. Check the course syllabus for information about how points are distributed among all course components (labs, homework assignments, exams, etc.) this semester.

Lab points are not converted into A, B, C, ... grades. At the end of the semester, the sum of your points earned for Physics 22000 (lab + recitations + exams) will be converted into one final letter grade.

If you have missed an experiment for a **valid reason** (e.g., illness):

- Give a written documentation to your lab TA during the next lab or bring it to his office and ask permission to make-up the missed lab.
- If you have not turned in the report from the previous lab, turn it in during the first day after your absence to the drop slot located below mailboxes between rooms PHYS 146 and PHYS 150 (make sure that your lab TA's name is written clearly on the cover page of your lab report).
- All lab make-ups are done in room PHYS 121 (Physics 22000 lab room) at the same day and time as regular classes.
- Prelabs for the make-up labs should be submitted on paper during the make-up session.
- Your TA will set the due dates for make-up lab reports.
- If you have more questions about make-ups, please ask the lab coordinator.

Subtracting 1 point per school day will penalize late lab reports. Even if your lab report is very late, (i.e., zero points for the lab report due to the penalty) you would receive points for the prelaboratory questions and the lab would be recorded as completed.

Students are not allowed to make up late lab reports or to make up more than one experiment during the scheduled lab make-up time. Re-doing labs is not possible. Make-ups are only for those who missed labs for a legitimate reason and got TA's permission to make-up labs.

You may not copy answers, lab reports, use "files", or allow your answers to be copied, by any other students (except of your lab partner). Any violation of the above standards will subject the offender to penalties allowed by the Purdue University. If you wonder whether a course of action violates this policy, simply ask in advance. Any attempt to forge data (e.g., copying data from previous semesters or from other students) or to forge your TA's initials will be penalized!

In a case of a long illness, (e.g., two or more weeks in a hospital) you need to get permission from the lab coordinator or the faculty in charge of the Physics 22000 course to make up the missed labs.

If you have any questions concerning the lab policies, please ask the lab coordinator. **Keep all graded lab reports** until the end of semester.

After 5:00 PM on May 2, 2016, we will not accept any lab reports (no exceptions)!

Physics 22000 Laboratory - Spring 2016

DATE	EXPERIMENT TITLE	REQUIRED
1/12-15	**Introduction and Diagnostic Test**	
1/19-22	**M1 - Measurements and Experimental Errors**	M1 Prelaboratory Questions (due on 1/19)
1/26-29	**Lab make-up for experiment M1**	
2/2-5	**M2 - Newton's Laws of Motion**	M1 Lab Report M2 Prelaboratory Questions (due on 2/2)
2/9-12	**M3 - Motion in Two Dimensions**	M2 Lab Report M3 Prelaboratory Questions (due on 2/9)
2/16-19	**M4 - Circular Motion**	M3 Lab Report M4 Prelaboratory Questions (due on 2/16)
2/23-26	**M5 - Impulse and Momentum**	M4 Lab Report M5 Prelaboratory Questions (due on 2/23)
3/1-4	**Lab make-up for experiments: M2 - M5**	
3/8-11	**M6 – Work and Energy**	M5 Lab Report M6 Prelaboratory Questions (due on 3/8)
3/15-18	**Spring Vacation**	
3/22-25	**M7 - Rotational Motion**	M6 Lab Report M7 Prelaboratory Questions (due on 3/22)
3/29-4/1	**Lab make-up for experiments: M6 - M7**	
4/5-8	**M8 - Archimedes' Principle**	M7 Lab Report M8 Prelaboratory Questions (due on 4/5)
4/12-15	**M9 - Pendulum**	M8 Lab Report M9 Prelaboratory Questions (due on 4/12)
4/19-22	**M10 - Standing Waves on Guitar Strings**	M9 Lab Report M10 Prelaboratory Questions (due on 4/19)
4/26-29	**Lab make-up for experiments: M8 - M10**	M10 Lab Report

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