PHY 115 Physics of Sports Laboratory
COURSE INFORMATION/SYLLABUS

General Course Info:

The lab will meet Tuesdays from 11:30am - 1:30pm in room A-125 of the physics building.

Instructor Info:

Peter Petrov
Office Hours: Wednesday 1:30 pm - 3:30 pm, Thursday 12:00 noon - 2:00 pm
Office: Physics Bldg. Room D-120
Email: petrov.p.peter@gmail.com
Phone: (631)632.xxxx (office), 609-216-1432
(You may call if necessary, but the best way to contact the lab instructor is by email.)

Lab Reports:

• Important: All lab reports are to be handed in to the instructor 1 week after the lab's meeting at the beginning of the following week's lab. Late lab reports are NOT accepted.
• Careful—All numbers in a lab report should come with clearly labeled unit (unless actually unitless). Graphs must have titles and labels for each axis, including the units of the quantities being plotted. Overall grammar and neatness will be considered as well.

Lab Report Format:

Introduction (1 point)
This section states the reason for conducting the lab. The introduction must include a description of what physical concepts are being studied and how the techniques used or measurements made in the lab relate to these concepts. Your introduction should usually be 1 paragraph. Although general discussion is necessary here, there must also be a clear sentence stating something like: The purpose of this lab is to [determine the velocity and acceleration behavior over time for a 40 m dash runner] by [using a digital camera with a known frame rate].

Procedure (1 point)
This section describes the steps taken while carrying out the lab. It is helpful to make careful notes during the lab of the procedures used, especially any that vary from the lab handout.
Description of the procedure should also include a careful accounting of the equipment which was used. A successful procedure section would allow a student who had not been present to reproduce the lab.

DO NOT copy this section directly from the lab handout—put it in your own words!

Data (1 point)
This section includes an organized and understandable presentation of data taken in the lab (if you prefer, you may simply summarize the data here as long as the complete and actual data is attached at the end of the lab.) Data taken in lab must be signed by the lab instructor before you leave! Additionally, you are strongly encouraged to analyze your data before leaving if you finish early. This way, any problems can be detected and corrected before the equipment is put away.

Data Analysis and Uncertainty Analysis (5 points)
This section is where you show relevant calculations, graphs, and results. For each type of calculation you do, please include one sample calculation clearly showing the equation used, the numbers which were plugged into the equation, and the end result (with units). Include all plots in this section—make them neat and large! This is also where you explain the uncertainty involved in the experiment.

Answer any questions from the lab handout in a separate subsection of Data Analysis and Uncertainty Analysis.

Conclusion (2 points)
For this section, write a short paragraph explaining what physical conclusion can be drawn from your data. First, summarize any major numerical results (“The average mass was found to be 5.0 kg +/- 0.1 kg.”) Then, comment on the significance of these figures. Did the experiment lead to expected results? Note: “We learned a lot about angular momentum” is NOT a conclusion!

Simply getting “good” results is not as important as thoughtfully interpreting the actual results encountered. Conversely, if you find that your data do not agree with the predictions of the laws of physics, do not panic. If it is clear you performed the lab correctly as described in the manual, you will not lose points for this. However, you are expected to speculate on what might have caused the discrepancy between your observations and your expectations. Was there wind that went unaccounted for? Was friction a factor? If you cannot think of an explanation, consult with the instructor before leaving lab. “Human Error” is NOT an explanation!

Other Remarks:
• There are NO makeup labs for this course! If you miss the lab due to an excused absence, your missed lab will not count against your final grade. An excused absence may include health issues (doctor's note required) or some other kind of emergency. Oversleeping, missing a train, breaking up with your girlfriend/boyfriend etc. are not excused absences. *If you miss more than two labs without valid excuses, you will fail the course, and if you miss more than 5 labs, you will not pass the course regardless of the excuses.*

• It is expected that you have carefully read the lab handout before coming to the lab. Preparation is an important part of being successful in the course.

• Your lab data must be signed by the lab instructor before you leave.

• No food, drinks, phone calls, etc. allowed in lab.

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**Course Schedule:**

*September 11*: Lab 1: Error Analysis  
*September 18 (Rosh Hashanah)*: Lab 2: 40 m Dash I  
*September 25*: Lab 3: 40 m Dash II  
*October 2*: No lab; prepare for PHY 113 Midterm I  
*October 9*: Lab 4: Hang Time  
*October 16*: Lab 5: 3-Point Shot  
*October 23*: Lab 6: Conservation of Linear Momentum  
*October 30*: Lab 7: Static Equilibrium  
*November 6*: No lab; prepare for PHY 113 Midterm II  
*November 13*: Lab 8: Conservation of Angular Momentum  
*November 20*: Lab 9: Mechanical Equivalent of Heat  
*November 27*: Lab 10: Golf Green Speed  
*December 4*: No lab; prepare for PHY 113 Final Exam