**Laboratory for Classical Physics (I)**
**PHY 133 Spring 2019**

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**About**

This is the organizational page for the Physics Introductory Labs PHY 133 for Spring 2019.

|  |  |  |
| --- | --- | --- |
| **Instructors** | **Director of UG Laboratory** | **Teaching Assistants** |
| R. Lefferts | B. Nielsen |

|  |  |
| --- | --- |
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**Scope**

The scope of the introductory labs is to give an understanding of basic experimental methods applied in physical sciences. The experiments performed during the lab sessions are closely related to the topics covered in the lecture.

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**Overview**

You will perform each week an experiment as indicated in the [**Manuals and Course Schedule**](http://phylabs1.physics.sunysb.edu/introlabs/Spring2019/PHY133.html#manuals) section. You have 2 hr 20 min time to perform each experiment. Each experiment will come with a manual that you can access from this webpage.

You are required to perform each lab experiment by yourself, mostly together with a lab partner.

Your perfomance in the lab session will be evaluated by your teaching assistant. The evaluation is based on the introduction of your lab report that you have to write up and submit to your TA at the beginning of the session and your performance during the experiment that includes a final written report that will be submitted in the week following the lab experiment. Please refer also to [**Lab Report Guide**](http://phylabs1.physics.sunysb.edu/introlabs/ReferenceDocs/PHY133LabReportGuide.html).

Your performance/report will count 100%, of which the pre-lab quiz is worth to 15%, toward your grade on the particular lab experiment.

Your final grade will be an average from your single lab grades scaled by a factor that will be determined at the end of the semester. This final grade will be a letter grade ranging from A to F.

Your lab report will be graded as follows:

1. **Pre-Lab Quiz (15 pts):** Posted to Blackboard. ***To be submitted before the beginning of the relevant lab.***
2. **Structure (15 pts):** Consists of the following sections of your report:
	* Introduction: A short overview of the experiment
	* Results: Outline what you get (plots, key calculated quantities, etc.).
	* Conclusion: Key insights of the experiment and caveats thereof
3. **Data table (10 pts):** A reasonably-formatted copy of the data you took in lab (along with calculated quantities, as relevant).
4. **Analysis (60 pts):** Varies, consists of the following components:
	* Graphs (see the [**PHY133/134 Plotting Tool**](http://phylabs1.physics.sunysb.edu/introlabs/PlottingTool/PHY130sPlottingTool.html))
	* Calculations, including uncertainty propagation (relevant work shown)
	* Discussion: Various other subsections of your report, which will vary from lab to lab

For more details, see the [**Guide to Lab Reports**](http://phylabs1.physics.sunysb.edu/introlabs/ReferenceDocs/PHY133LabReportGuide.html).

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**Manuals and Course Schedule**

Here is the schedule of labs for the semester:

The first lab sessions will take place in the week starting from **Monday, January 28.**

* Lab 0 (January 28 - January 31): [**Introduction to the laboratory and Uncertainty, Error & Graphs**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:error_and_uncertainty)
* Lab 1 (February 04 - February 07): [**The Pendulum**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:lab1Pendulum)    [**(Data Sheet)**](https://docs.google.com/spreadsheets/d/1pedAGE3oWSZVmkMoKIN2DQJ25InGVL-odCANf2PGRC4/edit?usp=sharing)
* Lab 2 (February 11 - February 14): [**Acceleration**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:lab2Acceleration)    [**(Data Sheet)**](https://docs.google.com/spreadsheets/d/1A3SZVjDqADnUE0Fi8HNYtCND8BIn7pK9Z8QidyRk89g/edit?usp=sharing)
* Lab 3 (February 18 - February 21): [**Projectile Motion**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:lab3projectilemotion)    [**(Data Sheet)**](https://docs.google.com/spreadsheets/d/1KduSgw_Pfek-FP2Ayf1-Ukq5ZCpSvKZjE7n7ClvMXws/edit?usp=sharing)

February 25 - March 01: Make-up Lab Week for Labs 1 - 3. No lab classes.

* Lab 4 (March 04 - March 07): [**The Atwood Machine**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:lab3atwood)    [**(Data Sheet)**](https://docs.google.com/spreadsheets/d/1Y9NdNvEem2p1x-kMtQR1_kUlWyrzpdbSc5Be9loTQ3o/edit?usp=sharing)
* Lab 5 (March 11 - March 14): [**Conservation of Energy**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:lab5conservationenergy)    [**(Data Sheet)**](https://docs.google.com/spreadsheets/d/1UPrZjhkT57qTxhsctgEjMpPqckG1YMDTeuQNE_qg2uE/edit?usp=sharing)

March 18 - March 22: Spring Break. No lab classes.

* Lab 6 (March 25 - March 28): [**Conservation of Momentum**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:lab6conservationmomentumlong)    [**(Data Sheet)**](https://docs.google.com/spreadsheets/d/1ved1RLIzujs51zrXmR9FKJwthhqKb1V8sZ0CKm058eU/edit?usp=sharing)

April 01 - April 05: Make-up Lab Week for Labs 4 - 6. No lab classes.

* Lab 7 (April 08 - April 11): [**Angular Momentum**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:lab7angularmomentumnew)    [**(Data Sheet)**](https://docs.google.com/spreadsheets/d/1Pqir3eoaFuu0oF2tjXiUY_6V2zcEvnUthbeGBKJHc_c/edit?usp=sharing)
* Lab 8 (April 15 - April 18): [**Simple Harmonic Motion**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:lab8simplemarmonicmotion)    [**(Data Sheet)**](https://docs.google.com/spreadsheets/d/1chXysno_gI41MwjvIIBFCe2LBrPAimP8MUz1luon7gc/edit?usp=sharing)
* Lab 9 (April 22 - April 25): [**Standing Waves**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:labstandingwaves)    [**(Data Sheet)**](https://docs.google.com/spreadsheets/d/1AhyVR_rnDjO52F3FtWxvlVGqDuwnGZpZ093XVs2KnXw/edit?usp=sharing)
* Lab 10 (April 29 - May 02): [**Ideal Gas Law and Absolute Zero**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:idealgaslaw)   [**(Data Sheet)**](https://docs.google.com/spreadsheets/d/1HSkWVB4EBmnS1QjiIwahxcxzAeoVCz-Byp38pRIAowM/edit?usp=sharing)

May 06 - May 10: Make-up Lab Week for Labs 7 - 10.

[**Link to All Data Sheets**](https://drive.google.com/drive/folders/19I5e8_3zKNUaMOB3HQZKLBsCoTuSNzXX)

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**Reference Documents and Tools**

Here are some documents you may find helpful:

[**Guide to Lab Reports**](http://phylabs1.physics.sunysb.edu/introlabs/ReferenceDocs/PHY133LabReportGuide.html)

[**Guide to Uncertainty and Error Analysis**](http://phylabs1.physics.sunysb.edu/introlabs/ReferenceDocs/ErrorAnalysis.pdf)

[**Introduction to Google Sheets**](http://phylabs1.physics.sunysb.edu/introlabs/ReferenceDocs/GoogleSheetsBasics.pdf) (and [**Advanced Techniques in Google Sheets**](http://phylabs1.physics.sunysb.edu/introlabs/ReferenceDocs/GoogleSheetsAdvanced.pdf))

[**How to Use Google Sheets in This Class**](http://phylabs1.physics.sunysb.edu/introlabs/ReferenceDocs/GoogleSheetsForLabs.pdf)

[**Guide to Making and Using Plots**](http://phylabs1.physics.sunysb.edu/introlabs/ReferenceDocs/MakingAndUsingPlots.pdf)

Here is a link to the plotting tool we will use to make our graphs in this class:

[**PHY133/134 Plotting Tool**](http://phylabs1.physics.sunysb.edu/introlabs/PlottingTool/PHY130sPlottingTool.html) ([**Older Version of PHY133/134 Plotting Tool**](http://skipper.physics.sunysb.edu/~physlab/doku.php?id=phy133:plottingtool))

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**Lab Sections**

To Be Announced

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **When** | **Where** | **Teaching Assistant** |
| PHY133 L01 | Mo 12:00pm - 2:20pm | A-117 |  |
| PHY133 L02 | Mo 12:00pm - 2:20pm | A-126 |  |
| PHY133 L03 | Mo 2:30pm-4:50pm | A-117 |  |
| PHY133 L04 | Mo 2:30pm-4:50pm | A-126 |  |
| PHY133 L05 | Mo 5:00pm - 7:20pm | A-117 |  |
| PHY133 L06 | Mo 5:00pm - 7:20pm | A-126 |  |
| PHY133 L07 | Tu 12:00-2:20pm | A-117 |  |
| PHY133 L08 | Tu 12:00-2:20pm | A-126 |  |
| PHY133 L09 | Th 12:00pm-2:20pm | A-117 |  |
| PHY133 L10 | Th 12:00pm-2:20pm | A-126 |  |
| PHY133 L11 | We 2:30pm - 4:50pm | A-117 |  |
| PHY133 L12 | We 2:30pm - 4:50pm | A-126 |  |
| PHY133 L13 | We 5:00pm - 7:20pm | A-117 |  |
| PHY133 L14 | We 5:00pm - 7:20pm | A-126 |  |

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**Due Dates, Late Work and Absence Policies**

You are responsible for keeping track of deadlines for your lab reports. A list of deadlines (and return dates for work) is available here: [**Due Dates**](http://phylabs1.physics.sunysb.edu/introlabs/Spring2019/DueDates133.html)

Be alert to announcements about changes to this schedule from your TA or via Blackboard.

**Any lab report submitted after the deadline will not be considered and receive zero points for the lab experiment.**

Exceptions for partial credit may be granted by a TA or the course instructor, with suitably documented reasons.

If you need to be absent for a lab experiment you will have to provide written documentation for a significant reason to be absent, e.g., a medical note from your doctor or a written document about jury duty.

With such documentation, you will have the opportunity to make up the lab experiment in the dedicated make-up week. Under such circumstances, please submit a make-up request via the [**PHY133 Make-Up Request Form**](https://docs.google.com/forms/d/e/1FAIpQLScmP5uuXFSZH_OxD58sB2-JlvkRKt-MpV1O4Q7LYktaG9QTUw/viewform?usp=sf_link)

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**Contact Us**

There are three ways to ask questions or report problems:

* To contact your TA, use the e-mail addresses provided at the top of this page. This is the best option for lab-specific questions, such as checking requirements.
* To contact all TAs, use PHY133\_lab@stonybrook.edu. This is the best option for general physics questions. If you cannot get in touch with your own TA and have a question on how to do a calculation (or why numbers look weird), this is also a reasonable place to contact.
* For administrative concerns, contact the course instructor, Richard Lefferts, at phy\_introlabs@stonybrook.edu or in Office Hours, 1-3pm Thursday in A-129 of Grad Physics. This is the best option if you have a problem with your TA or something of that nature.

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**Lab Manual Archives**

These are only pdf files (no forms or plotting functions)

[**Uncertainty, Error and Graphs**](http://phylabs1.physics.sunysb.edu/introlabs/labmanual_archive/Uncertainty%2C%20Error%20and%20Graphs.pdf)
[**The Pendulum**](http://phylabs1.physics.sunysb.edu/introlabs/labmanual_archive/PHY133_Pendulum.pdf)
[**Acceleration**](http://phylabs1.physics.sunysb.edu/introlabs/labmanual_archive/PHY133_Acceleration.pdf)
[**Projectile Motion**](http://phylabs1.physics.sunysb.edu/introlabs/labmanual_archive/PHY133_Projectile%20Motion.pdf)
[**The Atwood Machine**](http://phylabs1.physics.sunysb.edu/introlabs/labmanual_archive/PHY133_Atwood%20Machine.pdf)
[**Conservation of Energy**](http://phylabs1.physics.sunysb.edu/introlabs/labmanual_archive/PHY133_Conservation%20of%20Energy.pdf)
[**Conservation of Momentum**](http://phylabs1.physics.sunysb.edu/introlabs/labmanual_archive/PHY133_Conservation%20of%20Momentum.pdf)
[**Angular Momentum**](http://phylabs1.physics.sunysb.edu/introlabs/labmanual_archive/PHY133_Angular%20Momentum.pdf)
[**Simple Harmonic Motion**](http://phylabs1.physics.sunysb.edu/introlabs/labmanual_archive/PHY133_Simple%20Harmonic%20Motion.pdf)
[**Standing Waves**](http://phylabs1.physics.sunysb.edu/introlabs/labmanual_archive/PHY133_Standing%20Waves.pdf)
[**Ideal Gas Law and Absolute Zero**](http://phylabs1.physics.sunysb.edu/introlabs/labmanual_archive/PHY133_Ideal%20Gas%20Law%20and%20Absolute%20Zero.pdf)

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