

Syllabus — Physics 1601L / 1602L / 1501L / 1502L

This is a one credit hour course, and it is normally taken concurrently with Physics 116A. The topics covered will be similar to those in lecture, although not necessarily at the same time. You will probably want to refer to your regular physics text (Halliday, Resnick, and Walker) for supporting material.

Instructor

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* Note: e-mail sent to Dr. Charnock must include your **Course** (Physics 1601L, 1602L, 1501, or 1502L) and **Section Number**.

<https://my.vanderbilt.edu/physicslabs/>

1. Teaching Assistants

Dr. Charnock is the undergraduate lab director and the nominal instructor for the course. However, for most practical purposes, your instructor will be your Teaching Assistant (TA).

2. Lab Manuals

The Lab Manual is available. Note: You must provide a 3-ring binder to hold your lab manual. You will occasionally need extra paper, so add about 30 extra sheets of loose leaf paper to the binder.

3. Grading

Grades are based on the following assignments:

Lab Reports (70%): This includes the pre-lab sheets (which must be turned in at the beginning of class to receive credit), all the pages from your lab manual containing the data that you obtain during lab time each week, as well as answers to review questions given by the TA in the lab. There are 12 lab reports worth 20 points each. Reports are turned in at the end of the lab period.

Quizzes (30%): At the start of each lab (excluding the first), there will be a brief quiz covering the material from the previous lab. There will be no quiz covering the last lab.

The following scale defines the canonical threshold for each grade; the final thresholds may be lower:

Letter	Cutoff	Letter	Cutoff
A	≥ 93.34%	C	73.34–76.66%
A-	90.00–93.33%	C-	70.00–73.33%
B+	86.67–89.99%	D+	66.67–69.99%
B	83.34–86.66%	D	64.34–66.66%
B-	80.00–83.33%	D-	60.00–63.33%
C+	76.67–79.99%	F	< 60.00%

Adjustments may be made to this scale at the end of the semester based on how each TA's grade distribution compares to the distribution in the overall course, as well as those of previous semesters.

Unless otherwise stated by your TA, all work is done in lab and late work is not accepted. To receive full credit, lab reports must be turned in before leaving the lab unless the instructor indicates otherwise.

4. Lab Makeup Policy

Attendance at all lab sessions is mandatory. If you miss a lab, you must have a valid excuse.

- **You must be proactive in promptly scheduling a make-up lab.** Do not passively wait for someone else to tell you what to do.
- If you know ahead of time that you will be missing a lab, you must make arrangements to do the make up ahead of time. Email your TA and Dr. Charnock on the Friday before you anticipate missing the lab.
- If an emergency arises (sudden illness, accident, *et cetera*), email your TA and Dr. Charnock as soon as possible.
- In that email, include your . . .
 - Full name
 - Your TA's name
 - Lab (1501L, 1502L, 1601L, or 1602L)
 - Section number
 - A brief explanation of your absence
- If you do not get a response from Dr. Charnock within 24 hrs, email him again. (. . . and again.)
- Make-ups will only be allowed if you have a good reason: *e.g.* illness, death, and officially sponsored university activities. Social and Greek activities are not acceptable excuses. If in doubt, ask Dr. Charnock.
- Barring extraordinary circumstances, a penalty to the grade will be applied if Dr. Charnock is not notified of your situation within 24 hrs.
- Barring extraordinary circumstances, if Dr. Charnock is not notified of your situation within six days, the lab may not be completed and you will receive a zero for the missed lab and quiz.
- Barring extraordinary circumstances, labs not completed within two weeks will be assigned a grade of zero.
- Unless the absence is excused by Dr. Charnock, you will be responsible for materials covered on a quiz even if you missed the previous lab.

5. Honor Code

The Vanderbilt Honor Code applies to all work done in this course. Violations of the Honor Code include, but are not limited to

- Copying another student's answers on a pre-lab, lab questions, review questions, or quiz;
- Submitting data as your own when you were not involved in the acquisition of that data; and
- Copying data or answers from a prior term's lab (even from your own, in the event that you are repeating the course).

6. Accommodation Policy

If you need course accommodations due to a disability, if you have medical information to share with Dr. Charnock, or if you need special arrangements in case the building must be evacuated, please contact him as soon as possible. If you require extra time on tests or similar accommodations, please provide Dr. Charnock and your TA with your letter from the EAD and discuss your situation with your TA as soon as possible.

7. How to Get the Most from This Lab Course

Before class:

- (a) Read the overview of the lab in your manual. Use your textbook as a resource to understand the concepts involved in the lab in more detail.
- (b) Complete the pre-labs.
- (c) Come prepared with questions on any material you do not understand.

During class:

- (a) Be on time and make sure you come with the necessary supplies including your **lab manual** and a **scientific calculator**¹. If you do not have your lab manual, you may complete your report on plain paper, but you will be marked down. For some labs, you may find a laptop useful (particularly with Excel or some other spreadsheet), but this is not required.
- (b) You will not be allowed to use a cell phone, tablet, or any other networked device during quizzes.
- (c) No food or drink is allowed in lab.
- (d) Pay attention to explanations presented by the TA during class.
- (e) ASK QUESTIONS!! This is not only a way for you to better understand the material, but to also provide valuable feedback to the instructor.
- (f) Work together and efficiently with your lab partner: there may be another class coming into the lab after you. Some of the labs take longer than others.

After you are finished and before you leave:

- (a) Check over any work you've done to cut down on calculation errors
- (b) Clean your work station and turn off all of the equipment. Have your lab TA initial the end of your report.
- (c) Ask questions if there are any concepts that are still not clear to you
- (d) Turn in your report, neatly stapled in the correct page order. Attach any printouts as instructed by your TA.
- (e) Turn in your report, neatly stapled in the correct page order. Attach any printouts as instructed by your TA.

8. Significant Figures

Unless more rigorous analysis is demanded, you must apply the rules of significant figures when presenting numerical results. Read the introductory essay on significant figures in your lab manual.

9. Check your email daily.

¹ Graphing calculators are nice, but not necessary.

PHYS 1601 labs

LAB 1: ESTIMATION AND PROBLEM SOLVING

LAB 2: MEASUREMENT, UNCERTAINTY, AND UNCERTAINTY PROPAGATION

LAB 3: POSITION, VELOCITY, AND ACCELERATION IN ONE-DIMENSIONAL MOTION

LAB 4: FORCE, MASS, AND ACCELERATION

LAB 5: STATIC AND KINETIC FRICTION

LAB 6: SCALING AND THE PROPERTIES OF ELASTIC MATERIALS

LAB 7: ENERGY, WORK, AND POWER

LAB 8: MOMENTUM

LAB 9: TORQUE AND ROTATIONAL INERTIA

LAB 10: HARMONIC MOTION

LAB 11: DAMPED DRIVEN HARMONIC MOTION

LAB 12: STANDING WAVES AND RESONANCE

PHYS 1501L

LAB 1: ESTIMATION AND PROBLEM SOLVING

LAB 2: MEASUREMENT, UNCERTAINTY, AND UNCERTAINTY PROPAGATION

LAB 3: POSITION, VELOCITY, AND ACCELERATION IN ONE-DIMENSIONAL MOTION

LAB 4: FORCE, MASS, AND ACCELERATION

LAB 5: STATIC AND KINETIC FRICTION

LAB 6: SCALING AND THE PROPERTIES OF ELASTIC MATERIALS

LAB 7: ENERGY, WORK, AND POWER

LAB 8: FLUID PRESSURE

LAB 9: HARMONIC MOTION

LAB 10: STANDING WAVES AND RESONANCE

LABS 11 & 12: BROWNIAN MOTION

PHYS 1602 Labs

Lab 1: Electrostatics

Lab 2: Geometric Optics – Reflection and Refraction

Lab 3: Geometric Optics – Lenses

Lab 4: Building and Analyzing Simple Circuits I

Lab 5: Building and Analyzing Simple Circuits II

Lab 6: Introduction to Capacitors

Lab 7: Magnetism

Lab 8: Inductors and RL Circuits

Lab 9: Alternating Current and Impedance

Lab 10: Wave Optics

Lab 11: Spectroscopy and Fluorescence

Lab 12: Polarization of Light

PHYS 1502L Labs

Lab 1: Electrostatics

Lab 2: Geometric Optics – Reflection and Refraction

Lab 3: Geometric Optics – Lenses

Lab 4: Building and Analyzing Simple Circuits I

Lab 5: Building and Analyzing Simple Circuits II

Lab 6: Introduction to Capacitors

Lab 7: Magnetism

Lab 8: Inductors and RL Circuits

Lab 9: Alternating Current and Impedance

Lab 10: Wave Optics

Lab 11: Photoelectric Effect

Lab 12: Polarization of Light