

# PHYS-2021: General Physics II Laboratory

## Syllabus — Fall 2021

**Laboratory Location:** Brown Hall, Room 262

**Laboratory Manual:** Instructions to carry out each experiment will be posted on D2L. They are also accessible at web site:  
<https://faculty.etsu.edu/lutter/courses/phys2021/index.htm>

Due to the *Coronavirus Pandemic*, depending on the operational status of ETSU, this course could change from an In-class format to a *remote* (i.e., online) format for the Fall 2021 semester. The Laboratory Experiments can be found on the course web page listed above.

### Course Overview

**General Physics II Laboratory** is the second laboratory course in a two-semester sequence that covers the following main sections of classical physics: (1) **electricity**, including electric fields, forces, Coulomb's law, capacitance, current, resistance, and electrical circuits; (2) **magnetism**, including magnetic fields, magnetic forces, and inductance; (3) **wave mechanics**, which covers vibrating strings; and (4) **optics**, which covers reflection, refraction, and optical instruments. The "Electricity" topics are covered in experiments with the *Experiment #* prefix of **ELEC** in the table below. The "Magnetism" topics are covered in experiments with the **MAGN** prefix, "Wave Mechanics" with **WAVE**, and "Optics" with the **OPTC** prefix. The Lab Schedule on the back of this syllabus lists the labs that will be performed this semester. The Lab Instructions provided on the course web page (listed above) have either been written by faculty of the Department of Physics and Astronomy of East Tennessee State University or are modified versions of instructions provided by *PASCO*.

The main goal of this course is to demonstrate the techniques used to carry out experimental physics. Besides learning measurement techniques, the student will be trained to be very detailed in raw data collection and analysis. You will need to solve equations (just as you do in the lecture course) and come up with numerical solutions to these equation. **As such, you are expected to have (and know how to use) a good scientific calculator.** The Department does not have calculators to loan — the *sharing* of calculators during lab period is frowned upon. The book store carries such calculators.

The laboratory experiments performed in this course complement the material covered in the **General Physics II** lecture course (PHYS-2020). Note however that the lecture course and the laboratory course are graded **independently** of each other — the grade earned in this course (PHYS-2021) does not affect the grade eared in PHYS-2020 and vise-versa.

The lab instructor for each section of PHYS-2021 will inform their class of office hour times and locations. This information will be presented either during the first class meeting or on the course page in D2L.

## In-Class Laboratory Reports and Attendance

Until further notice, **ALL STUDENTS MUST** wear facemasks while attending this course on campus as per ETSU policy. This is due to the significant increase in the number of reported cases of COVID-19 across our region. This increase is primarily the result of the emergence of the highly infectious Delta variant, coupled with the reality that vaccination rates across our region trail national averages.

Your course grade is based upon the total scores received on your **Laboratory Reports** (see Page 3). Note that the **Lab Reports** will be due at the beginning of the lab the following week (in most cases). Most of the **Lab Reports** must follow the style outlined in the **Lab Report Format** document available on the course web page (e.g., **lab\_report\_format.pdf**) and must be very neat and detailed *including* the raw data sheet(s). Exceptions to this rule are noted in the Lab Instructions for that specific lab. **You must come to every lab!** Should you be sick, you will have the option of making up a given lab the following week (during a pre-arranged special time), but once that week is up, you will receive a zero for the missed lab. Also, you will need a note from your doctor (with the doctor's phone number) to excuse you for the missed lab, otherwise, you will not be able to make the lab up.

**You are to do your own work on your lab report!** If any duplicate lab reports are submitted, all of the students submitting these labs including the original will receive a zero for that lab. Lab reports will have 2 points (out of 10 total) deducted for each week that the report is late up to two weeks. **Once the two-week mark has passed, you will automatically receive a zero for that lab.** Your final grade will be based on the percentages listed on the Lab Schedule on the next page.

### Additional Information

**NOTE THAT THE GENERAL PHYSICS LAB I AND II HAS BEEN SUBSTANTIALLY REORGANIZED. ANY LAB MANUAL FROM PREVIOUS SEMESTERS ARE OBSOLETE. THE NEW LAB MANUAL IS NOW ONLINE AT:**

<https://faculty.etsu.edu/lutter/courses/phys2021/index.htm>

Please read the online manual carefully including the Information and Policies and Lab Report Format documents at the bottom of the course web page. Your lab instructor will discuss any additional individualized requirements they may have in the orientation lecture. *If you have any questions concerning lab policies, lab report format, and/or lab conduct, be sure to discuss them with your lab instructor.*

## Online/Remote Laboratory Reports and Attendance Policy

Due to the *Coronavirus Pandemic*, this course could switch from being an In-class format to a *remote* (i.e., online) format for the Fall 2021 semester. The Online Laboratory Experiments can be found on the course web page listed above.

The lab instructor for each section of PHYS-2021 will inform their class of an alternative to office hours. This information will be announced on the course page in D2L.

Your course grade is based upon the total scores received on your Laboratory Reports. The Laboratory Report PDF files can be found on the course web page listed on Page 1 of this syllabus. Lab Reports are to be submitted into the associated Dropbox on the course D2L page by **6 p.m. eastern time** on the **Due Date** specified by your instructor. **You must complete each lab!**

**You are to do your own work on your lab report!** If any duplicate lab reports are submitted, all of the students submitting these labs including the original will receive a zero for that lab. Lab reports will have 2 points (out of 10 total) deducted if submitted a week late. **Once that week-late mark has passed, you will automatically receive a *ZERO* for that lab.** Your final grade will be based on the percentages listed on the Lab Schedule on the next page.

### Additional Information

These Online Labs are designed to be download from the course web page (listed on Page 1) or the course D2L web page, and opened up using PDF software like **Adobe Reader or Preview**. You can then type your responses into the blanks electronically, save it and then upload to a Dropbox setup in D2L by the **Due Date**. Alternatively, you can print it out, complete it in writing (i.e., by hand), scan it or take a photo of it, then upload to the Dropbox setup on the course D2L page by the **Due Date**.

If you encounter problems, see the document:

**Tips for Viewing and Using Fillable PDFs.**

This document on the course web page at

<http://faculty.etsu.edu/lutter/courses/phys2021/index.htm>.

# General Physics II Lab (PHYS-2021)

## Fall 2021 Schedule

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Dates	Online Lab	In-Class Lab
Aug. 26, 27	Coulomb's Law	Electrostatic Charges
Sep. 2, 3	Capacitance	Capacitance
Sep. 9, 10	No PHYS 2021 Labs this week ( <b>Labor Day Week</b> )	
Sep. 16, 17	Ohm's Law	Ohm's Law
Sep. 23, 24	RC Circuits	RC Circuits
Sep 30, Oct 1	Resistivity	Resistivity
Oct. 7, 8	Magnetic Fields	Earth's Magnetic Field
Oct. 14, 15	No PHYS 2021 Labs this week ( <b>Fall Break</b> )	
October 21, 22	Snell's Law	Magnetic Field of Coils
Oct. 28, 29	Vibrating Strings	Vibrating Strings
Nov. 4, 5	Resonance of Sound	Sound
Nov. 11, 12	No PHYS 2021 Labs this week ( <b>Veterans Day</b> )	
Nov. 18, 19	Mirrors and Lenses	Mirrors, Lenses & Image Formation
Nov. 25, 26	No PHYS 2021 Labs this week ( <b>Thanksgiving Holiday</b> )	
Dec. 2, 3	Interference	Interference and Diffraction of Light

Lab grades are determined by your performance on 11 either Online or In-Class lab experiments. Each experiment counts 10 points. There are thus a total of 110 points possible, and the grade scale is:

A	→	92.00-100%	→	102 or more points
A-	→	90-91.99%	→	99-101 points
B+	→	87-89.99%	→	96-98 points
B	→	83-86.99%	→	92-95 points
B-	→	80-82.99%	→	88-91 points
C+	→	77-79.99%	→	85-87 points
C	→	73-76.99%	→	81-84 points
C-	→	70-72.99%	→	77-80 points
D+	→	67-69.99%	→	74-76 points
D	→	60-66.99%	→	66-73 points
F	→	Less than 60%	→	65 points or less