

Lyon College Course Syllabus

Course Number and Section: PHY241.01, 241.02, 241.03

Course Title: Fundamentals of Physics 1 lab 1

Course Meeting Days/Times: .01W .02 R .03 F 1-3:50 Semester/Year: FA2022

Professor's Information

Name: Stuart Hutton

Office Location: Derby 248 Office Hours: MWF 10-10:50/AR

E-mail Address: stuart.hutton@lyon.edu Phone Number: ***.307.7560

Physics: Email: lyonphysics@*****.*** SMS: 307.***.8765 Gateway: physics.lyon.edu

Standard Policies

Honor Code

All graded work in this class is to be pledged in accordance with the Lyon College Honor Code. The use of a phone for any reason during the course of an exam is considered an honor code violation.

Class Attendance Policy

Students are expected to attend all class periods for the courses in which they are enrolled. They are responsible for conferring with individual professors regarding any missed assignments. Faculty members are to notify the Registrar when a student misses the equivalent of one, two, three, and four weeks of class periods in a single course. Under this policy, there is no distinction between "excused" and "unexcused" absences, except that a student may make up work missed during an excused absence. A reminder of the college's attendance policy will be issued to the student at one week, a second reminder at two weeks, a warning at three weeks, and notification of administrative withdrawal and the assigning of an "F" grade at four weeks. Students who are administratively withdrawn from more than one course will be placed on probation or suspended.

Academic Support

The Morrow Academic Center (MAC) helps students who want to improve grades by providing peer-led services including Supplemental Instruction (SI), tutoring, the Writing Center, and academic coaching as well providing 24-hour, online tutoring for all subjects through Tutor.com. A schedule of peer-led services is available at lyon.edu/mac and Tutor.com is accessed through courses in Schoology. Contact Donald Taylor, Director of Academic Support, at 870-307-7319 or donald.taylor@lyon.edu for more information about MAC services.

Technology Support

For general technology support, you can contact the IT department by emailing support@lyon.edu or by calling 870-307-7555. For assistance with classroom-related technologies, such as the learning management system (LMS), you can request support using the methods above, or you can contact sarah.williams@lyon.edu directly for assistance. Your course content will be accessible digitally using either the Schoology or Canvas LMS. Both LMS platforms will use your myLyon credentials for your student login.

- For Canvas, login at lyon.instructure.com
- For Schoology, login at lyon.schoology.com

Disabilities

Students seeking reasonable accommodations based on documented learning disabilities must contact Interim Director of Academic Support Donald Taylor in the Morrow Academic Center at (870) 307-7019 or at donald.taylor@lyon.edu.

Harassment, Discrimination, and Sexual Misconduct

Lyon College seeks to provide all members of the community with a safe and secure learning and work environment that is free of crime and/or policy violations motivated by discrimination, sexual and bias-related harassment, and other violations of rights. The College has a zero-tolerance policy against gender-based misconduct, sexual assault, and interpersonal violence toward any member or guest of the Lyon College community. Any individual who has been the victim of an act of violence or intimidation is urged to make an official report by contacting a campus Title IX coordinator or by visiting www.lyon.edu/file-a-title-ix-report. A report of an act of violence or intimidation will be dealt with promptly. Confidentiality will be maintained to the greatest extent possible within the constraints of the law. For more information regarding the College's Title IX policies and procedures, visit www.lyon.edu/title-ix.

Mental & Behavioral Health

Lyon College is dedicated to ensuring each student has access to mental and behavioral health resources. The College's Mental and Behavioral Health Office is located in Edwards Commons and is partnered with White River Health System's Behavioral Health Clinic. The office is committed to helping the Lyon community achieve maximum mental and behavioral wellness through both preventative and reactive care. A full-time, licensed, professional counselor provides counseling, consultations, outreach, workshops, and many more mental and behavioral services to Lyon students, faculty, and staff at no cost. The Mental and Behavioral Health Office also provides access to White River Health System's services and facilities, including medication management and in-patient and out-patient care. To make an appointment, contact counseling@lyon.edu.

College-Wide COVID-19 Policies for Fall, 2022

- The College does not require masks in instructional and meeting spaces inside academic buildings. However, if instructors require masks in their classroom, lab, or studio, then students and guests must comply with that requirement.
- Vaccines are strongly encouraged for all faculty, staff, and students. Vaccines are not mandated for Lyon College community members, although there may be specific courses involving interactions with vulnerable, external populations where a vaccine may be required.
- The College will continue to offer symptomatic testing for students, faculty and staff.

Details specific to this course may be found in the subsequent pages of this syllabus. Those details will include at least the following:

- 1 A description of the course consistent with the Lyon College catalog.
- 2 A list of student learning outcomes for the course.
- 3 A summary of all course requirements.
- 4 An explanation of the grading system to be used in the course.
- 5 Any course-specific attendance policies that go beyond the College policy.
- 6 Details about what constitutes acceptable and unacceptable student collaboration on graded work.
- 7 A clear statement about which LMS is being used for the course. We will use schoology this fall.

Tentative Syllabus for Physics Lab 241: Fall 2022

Professor: Dr. Stuart Hutton

Office: Derby Center: 248 Research Lab: Derby 219: General Physics lab: 148

SMS: 307.***.8765 /lab email: lyonphysics@<*.com> web: physics.lyon.edu

Phone: ***.307.7560 Email: stuart.hutton@lyon.edu

Note this very clearly: labs are due by lab time 1 week after completing the lab. Up to 1 week late, you lose $\frac{1}{2}$ credit for the lab (2 $\frac{1}{2}$ credit deductions lowers your final grade by a letter grade; more than 6 $\frac{1}{2}$ credit deductions will result in course failure.) Labs are not accepted more than 2 weeks after completion of the lab and your final grade will be reduced by a letter grade each time. Additionally NO labs will be accepted after the last day of classes which is, this semester, Dec 02, 2022. If you fail to receive accepted for more than 3 labs, you will fail the course. Any required revisions must be completed within the same 2 week time frame or they are not accepted which again results in your final grade being reduced by a letter grade.

Grading

As a general guide to grades, grades will be assigned as follows:

100-90]	(90-80]	(80-70]	(70-60]	<(60
A	B	C	D	F

There are about 10 labs this semester and each lab provides 10 points in your final grade. The particular grade in each individual lab is awarded as follows: 100% of the grade (or 7 points) is awarded for successful completion of the lab awarded contingent upon submission of an acceptable lab report following the guidelines and rubric on the lab website. Note, however, that in the event that an acceptable lab report is not submitted, the lab is considered to not have been done and the final course grade will be lowered by 1 letter grade. **If you fail to submit more than 3 accepted reports, you will fail the course.** Each student is to submit an individual and independent electronic lab report for each experiment completed and the report must be accepted in order to obtain credit. You will have the opportunity to respond to comments from the received electronic labs and then revise and resubmit your reports. Refer to Student Learning Outcomes for a discussion of minimal course outcome expectations.

Note: If you miss one of the labs when experiments are done and it is not made up, your lab grade will be lowered by one letter grade for each missed lab which is not made up. The full lab, including writeup, must be completed or your grade will be reduced by one letter grade for each lab not fully completed. You must make up any excused absences at the first opportunity.

It is important that you understand what you did during the lab before turning the lab report in to your professor. Your work on lab write-ups will be graded for correctness, clarity and completeness. If you want full credit for a lab, **you must** supply the logical steps that led to the result and the result **must include proper units**. You should supply sample calculations where appropriate. Diagrams and graphs should be included where appropriate. Aside from data tables and graphs, the components required for the proper lab write-up should take about 2 - 3 pages maximum for any given lab. Be sure that each lab starts with a cover page as indicated in the lab write-up guidelines. Make sure that your lab write-up is in the form of paragraphs with correct English grammar as indicated on the lab write-up guidelines. Failure to follow the guidelines will negatively impact your grade.

Phy241 is a separate course from either Phy210 or Phy240.

The grade in Phy241 has no impact upon the grade in either Phy210 or Phy240 except as a co-requisite.

In this course, your grade will depend upon successful completion of lab experiments and reports. **You are also expected to have read the lab before coming to class and to have reviewed the lab material.** You should bring your text, a calculator, and paper to lab. Labs will be completed and submitted during lab. In order to do this, you will need to come to lab on time. Making up the lab for such absences is normally not permitted: it is thus in your interest to show up to lab

on time. Additionally, you should **never plan** other activities during the lab period since labs normally will occupy the entire period. Your prime learning resource is the classroom: **punctual** and **complete** class attendance is expected. **Absences will negatively impact your final grade.**

Lab report formats

If you miss a lab for an excused reason, you must make up the lab as soon as possible. If you fail to hand in a lab report late which is accepted, you will lose a minimum of 10% of your grade final grade. Labs must be submitted in **pdf** format electronically. **When including spreadsheet screen captures in your reports, be sure to format tables so they fit on the page. I should be able to read your lab (as a single document in pdf format) without having to change anything. This means, check (proofread) your pdfs before you send them to make sure you can read them. Specifically, you must check your sent email to confirm that any attachments sent were correctly attached, could be opened, and were in pdf format.**

If you miss one or more of the labs without makeup, your lab grade will be lowered by one letter grade for each missed lab which is not made up. Do not submit non-pdf attachments or corrupted files via email and expect to obtain extra time to complete the lab.

Course Description

In this course you will be exposed to the experimental side of physics. Among the topics that we will investigate are mechanics, waves, and thermodynamics.

Course Objectives

As a consequence of this course, you should obtain an enhanced understanding of the experimental nature of physics. In addition, you should come away from this course with an ability to interpret data in a scientifically valid manner and to have increased experience with writing brief technical reports. Refer to Student Learning Outcomes for a discussion of minimal course outcome expectations.

Course Prerequisites

In order to be taking the physics lab, you must be currently enrolled in either physics 210 or physics 240 and therefore you must satisfy the prerequisites for those courses.

Text

The text will consist of handouts in electronic format obtained via the physics gateway at: <http://physics.lyon.edu>

Academic Integrity

Each student is to submit an individual and independent electronic lab report for each experiment completed and the report must be accepted in order to obtain credit. Students are specifically prohibited from reference to lab reports prepared by other students in the preparation of their own reports.

**CLASS SCHEDULE / OFFICE HOURS Fall 2022
Pandemic Part 3 Version**

Professor: Stuart Hutton

Monday	Tuesday	Wednesday	Thursday	Friday
8:00-8:50 PHY240.01 Fundamentals of Physics I	8:00-9:15	8:00-8:50 PHY240.01 Fundamentals of Physics I	8:00-9:15	8:00-8:50 PHY240.01 Fundamentals of Physics I
9:00-9:50 PHY210.01 General Physics 1		9:00-9:50 PHY210.01 General Physics 1		9:00-9:50 PHY210.01 General Physics 1
10:10-10:50 Office Hours	10:00 - 10:50	10:10-10:50 Office Hours	10:00 - 10:50	10:10-10:50 Office Hours
11:00-11:50	11:00-11:50	11:00-11:50	11-11:50	11:00-11:50
12:00-12:50	12:00-12:50	12:00 - 12:50	12:00 - 12:50 Phy390.01 Seminar Derby 148	12:00 - 12:50 SGA
13:00-15:50	13:00-14:50	13:00-15:50 PHY241.01 Fundamentals of Physics Lab 1 Derby 148	13:00-15:50 PHY241.02 Fundamentals of Physics Lab 1 Derby 148	13:00-15:50 PHY241.03 Fundamentals of Physics Lab 1 Derby 148

Schedule for Phy210, Phy240, and Phy241: Fall 2022: Revision 01

labs	Worksheet Number	Date	210: Cutnell: 8 th ed. Assignment Reading : Homework	240: Serway 4 th ed Assignment: Reading: homework
WRF Lab 00: intro lab	Class Initialization	W August 17	Chapter 01: Units, vectors, math and trig	Chapter 01 Introduction and Vectors
	Worksheet 01 units trig	F August 19	Chapter 01:H01	Chapter 01:H01
	Worksheet 02 1d motion	M August 22	Chapter 02:H02: 1d motion	Chapter 02:H02 1d motion
WRF Lab 01: Forces & Vectors	Worksheet 03 free fall	W August 24	Chapter 02:H03	Chapter 02:H03
	Worksheet 04 2d motion1	F August 26 UQ01	Chapter 03:H04: 2d motion	Chapter 03:H04: 2d motion
	Worksheet 05 2d motion2	M August 29	Chapter 03:H05	Chapter 03:H05
WRF Lab 02: 1 and 2 D motion Problems	Worksheet 05 2d motion2	W August 31	Chapter 03:H05	Chapter 03:H05
	Worksheet 06 force1, fbd	F September 02 UQ02	Chapter 04:H06: Forces, fbd	Chapter 04:H06 Forces, fbd
	Labor Day Holiday	M September 05		
WRF Lab 03: Planes & Friction	Worksheet 07 force 2, fbd	W September 07	Chapter 04:H07	Chapter 04:H07
	UnTest#1	F September 09	Chapter 04	
	Test 1: coverage: ws01-ws07	M September 12		
WRF Lab 04: Atwood's, mechanical advantage, work & Energy	Worksheet 08 inclined plane	W September 14	Chapter 06:H08: work and energy	Chapter 06:H08 Energy and Energy Transfer
	Worksheet 09 inclined 2	F September 16 UQ03	Chapter 06: H09	Chapter 07:H09 Potential Energy
	Worksheet 10 energy 2	M September 19	Chapter 07:H10: impulse, momentum	Chapter 08:H10 Momentum and Collisions
WRF Lab 05: Centripetal Force & Hooke's Law	Worksheet 11 spring energy	W September 21	Chapter 07: H11	Chapter 08:H11
	Worksheet 12 collisions1	F September 23 UQ04	Chapter 05:H12: Uniform Circular Motion	Chapter 10:H12 Rotational Motion
	Worksheet 13 collisions2	M September 26	Chapter 08:H13: Rotational kinematics	Chapter 10:H13
WRF Lab 06: Static Equilibrium	Worksheet 14 ucm 1	W September 28	Chapter 08: H14	Chapter 10:H14
	Worksheet 15 acc frames	F September 30 UQ05	Chapter 09:H15: Rotational dynamics	Chapter 10:H15
	Fall Break	October 01 - October 05		
WRF: Lab TBA	Worksheet 16 non ucm	W October 05		
	UnTest#2	F October 07		
	Test 2	M October 10		
WRF Lab 07: Simple Harmonic Oscillation	Worksheet 17: Rotate2 energy	W October 12	Chapter 09: H17	Chapter 10:H17
	Worksheet 18 Torque, L	F October 14 UQ06	Chapter 09: H18	Chapter 10:H18
	Worksheet 19 statics	M October 17	Chapter 10: H19 Simple Harmonic Oscillation	Chapter 12:H19 Oscillatory Motion
WF Lab TBA	Worksheet 20 osc1:spring	W October 19		
	Service Day	R October 20		
	Worksheet 21 osc2:pendulum	F October 21 UQ07		
	Worksheet 22 string waves1	M October 24	Chapter 10: H20	Chapter 12:H20
WRF Lab 08: Standing Waves and Vibrations	Worksheet 23:string waves2	W October 26	Chapter 10: H21	Chapter 12:H21
	Worksheet 24 sound waves	F October 28 UQ08	Chapter 16:H22 waves and sound	Chapter 13:H22 Mechanical Waves
	Worksheet 25 beats, Doppler	M October 31	Chapter 16:H23	Chapter 13:H23
WRF Lab TBA	UnTest 3	W November 02		
	Test 3	F November 04		
	Worksheet 27 therm 01	M November 07	Chapter 12: Temperature and Heat	Chapter 16: Temperature and the kinetic theory of gasses
WRF Lab09: Archimedes' Principle & Pressure	Worksheet 28 therm 02	W November 09	Chapter 13:H27: transfer of heat	Chapter 16:H27
	Worksheet 29 therm 03	F November 11 UQ09	Chapter 14:H28: IDG and kinetic theory	Chapter 17: H28:Energy in Thermal Processes: 1 st law of thermo
	Worksheet 30 therm 04	M November 14	Chapter 15::H29: thermodynamics	Chapter 18: H29: Heat Engines, Entropy, and the 2 nd law of thermo
WRF Lab 10: Thermodynamics	Worksheet 30 (continued)	W November 16	Chapter 15: H30	Chapter 18:H30
	Untest #4	F November 18		
	Thanksgiving	November 23 - November 28		
	Test 4	M November 28		
	Worksheet 26 Archimedes Worksheet 31 Fluids 1 {Gravitational Interactions}	W November 30	Chapter 17: H25 Chapter 11: H31: Fluids	Chapter 14:H25 15: H26:Fluid Mechanics :Sections 15.1 - 15.4 Chapter 16: H31:Fluid Mechanics: Sections 15.5-15.9
	Course Review / last day	F December 02		
	Final Exams	December 04-December 10		

Notes on the lab write-up for physics labs Fall 2022

Your first (cover) page should include the following information:

Your Name, Date, Partners, Title of Experiment and the abstract.

(Then insert a page break)

Each lab must be the unique written effort of the student submitting the report. You may NOT reference or use lab reports (prepared by others) in your report preparation although you are most certainly encouraged to talk to your lab colleagues.

Lab reports must be electronically submitted to the appropriate address as a single pdf document.

Title: Concise wording that describes the essence of the lab.

Abstract - a summary of your research including general methods and major conclusions. This is usually one paragraph long and should convince someone to read your paper. Include a statement of your hypothesis here and if data supported it.

Introduction: An overview of your experiment, statement of hypothesis, what you did and what the theory was behind the experiment.

Methods: - A brief discussion of experimental techniques. Diagrams are usually appropriate in this section.

Results -written usually in the past perfect tense or passive voice; describes your findings, data collected, and includes data tables, graphs, general trends, derived formulas, etc. All work and data tables must be shown here. In general, you need to have a copy of your original data with you but the data included in the lab report can be copied from your original data. Data should be absent of obvious errors (since you would have tracked down these items).

Discussion and analysis - tense can vary, describes your results in relation to other data, discusses problem associated with the lab, postulates trends in the data, predicts results given different circumstances, suggests sources of error, etc. Discuss how the data supports, or does not support your hypothesis and how well such support is in terms of error analysis such as percent differences. **Be sure to include sample calculations in this section.**

Literature Cited - a list of books, articles, etc., that you used to assist you in presenting your data and which were referred to in the write-up. **When citing a reference from the internet, you MUST include the URL that points directly to the document so that a single click of the mouse will bring up that exact document. Every lab report will have at least 1 citation or the report will not be accepted.**

Your presentation of the lab is important. Be sure it is grammatically correct and neatly typed. Be careful of tense changes within a paragraph. Data collected during a lab must be authentic. "Fudging" is unacceptable and unnecessary.

Lab write-ups should be as **concise** as possible within these guidelines. I am not looking for exhaustive tomes of work in a lab write-up.

Physics Lab Grading Rubric Fall 2022

Note: Each student has the opportunity to revise deficient portions of the lab report during the lab period except for teamwork, arrival and departure.

	1	0.5	0
Scientific Thought	Hypothesis in abstract and introduction. Supporting evidence (or non-supporting) discussed in conclusion.	Hypothesis in abstract and introduction but not relevant and supporting evidence (or non-supporting) not discussed in conclusion.	Hypothesis absent in abstract and introduction; Supporting evidence (or non-supporting) not discussed in conclusion
Critical thinking	Correct discussion of experiment, and how results relate to hypothesis.	Incomplete discussion of experiment and how results relate to hypothesis	poor or absent discussion of experiment, and how results relate to hypothesis.
Inquiry and Analysis	Complete discussion of experimental technique and data results	incomplete discussion of experimental technique and data results	poor or absent discussion of experimental technique and data results
Informational Literacy	Correct physical terminology contained in report. At least one reference present.	incomplete physical terminology contained in report. Reference present but not correct.	incorrect or absence of physical terminology contained in report. Reference not present.
Quantitative Literacy	Correct usage of calculations including spreadsheets	correct usage of calculations including spreadsheets but something significant missing	Absent or incorrect usage of calculations including spreadsheets
Teamwork	Successful team completion of lab		Unsuccessful team completion of lab
Arrival	on time		tardy or absent
Departure	Work space returned as it was when arriving		Workspace left in disorder upon departure
Overall report	All required elements present		Required elements missing.
Quality	experimental results presented without obvious errors		experimental results presented with obvious errors

Safety regulations for General Physics Labs Fall 2022 Pandemic Version

At all times in the labs, students must properly wear face masks.

Correct social hygiene must be practiced at all times in the lab and masks must always be properly worn. Students are responsible for sanitizing work areas (including equipment) before and after lab.

- (1) Anytime springs are used in lab, safety goggles must be worn.
- (2) Anytime boiling water is used in lab, safety goggles must be worn.
- (3) You should not look at laser light or point it towards other people.
- (4) In the event of a spill (which will be water), dispense a towel from the spill kit (aka towel dispenser) and wipe up the spill.
- (5) Food and drink are not permitted in lab.

College-Wide COVID-19 Policies for Fall, 2022

- (6) Masks are mandated for all students in my classrooms, and laboratories. All other Lyon covid restrictions apply.

Attach this form to your email (as an extra attachment today) when you send in your introductory lab report. In your lab report, right below your name, you should say this:
I have read the safety regulations attached to this email.

Student Learning Outcomes for the Physics Program at Lyon College FA2022

1. Students who complete the physics 210/220, 240/250, 241/251 sequence are able to

1a. Articulate the basic principles of physics.

1b. Apply the basic principles of physics to solve a variety of qualitative and quantitative problems at the introductory physics level.

This can be measured with portions of exam problems.

General Education learning outcomes for Phy 210/Phy240/ Phy241/Phy220/Phy250/Phy251

Critical thinking: 210,240.241,220,250,251

Inquiry and analysis: 241.251

Quantitative literacy: 210,240.241,220,250,251

Scientific thought and Information literacy: 210,240.241,220,250,251

Portions related to Phy241,Phy251 will be evaluated for **1** selected labs with rubric data recorded. Since students are allowed to submit revised reports, the initial submission will normally serve as the indicator. Portions related to 210,240,220/250 rubric will have results recorded from exams.

Critical thinking is regularly evaluated in 210,240.241,220,250,251. It is evaluated in terms of starting with correct physical principles applicable to a given situation and being able to follow it through to completion. It is evaluated by use of exam problems. In 241/251, it is part of the process of scientific thought and is evidenced by use of supporting data for a hypothesis as is required by the lab rubric.

Inquiry and analysis is regularly evaluated in 241/251 as part of the required element of completed lab writeups. It is evidenced by student explanation of the experiment and is a required element by the rubric.

Quantitative literacy is evidenced primarily in 210/240/220/250 by successful completion of physical problems with correct units and correct numerical operations. It is evaluated by use of exam problems. Quantitative literacy is exhibited in 241/251 by students being able to follow through with calculations partially enabled by spreadsheet examples and being able to interpret the results. This is evidenced by the writeup and is a required element by the rubric.

Scientific thought and information literacy is regularly evaluated in 241/251 and is evidenced by use of hypothesis with supporting evidence (or not supporting evidence) based upon experiment as is required by the lab rubric for 3 selected labs. Information literacy is regularly evaluated in 241/251 and is evidenced by correct physical terminology in lab reports as required by the lab rubric. It is also a significant portion of 210/240/220/250 and is evidenced by student success in using the basic physical terminology enabling students to correctly initiate quantitative solutions to physical situations.