

## Elements of Physics Lab

### PHYS-103

CG Section 8WK 11/08/2019 to 04/16/2020 Modified 03/28/2022

### Course Description

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An optional lab to accompany PHYS 101. Attention will be given to laboratory procedures of physics, safety, mathematics, measurement, and data manipulation, and everyday uses of physics.

#### Requisites

For information regarding prerequisites for this course, please refer to the [Academic Course Catalog \(https://catalog.liberty.edu/\)](https://catalog.liberty.edu/).

### Rationale

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PHYS 103 is an optional lab to accompany PHYS 101. It will introduce basic laboratory procedures such as safety, mathematics, measurement and data manipulation and will reinforce every day uses of physics.

### Course Learning Outcomes

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Upon successful completed of this course, the student will be able to:

- A. Use laboratory equipment necessary for the completion of an experiment.
- B. Exhibit skill in laboratory technique and safety procedures.
- C. Record data on a laboratory report.
- D. Use correct mathematical formulas and display neat and clear calculation setups and final solutions on a laboratory report.
- E. Present clearly written rational conclusions to a laboratory investigation on a laboratory report.

#### General Education Foundational Skill Learning Outcomes: Social and Scientific Inquiry

- A. SSI 1: Demonstrate an understanding of the impact of science on the world in which we live.
- B. SSI 2b: Demonstrate a biblical understanding of humankind's role in scientific inquiry and discovery.
- C. SSI 3: Apply solutions for a social and/or scientific question experienced in nature or society.
- D. SSI 4: Describe how social and/or scientific inquiry equips human beings to be participants in God's redemptive work.

### Course Resources

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Click on the following link to view the required resource(s) for the term in which you are registered: [Liberty University Online Bookstore \(https://bncvirtual.com/liberty/\)](https://bncvirtual.com/liberty/).

#### Additional Materials for Learning

- A. Computer with basic audio/video output equipment
- B. Internet access (broadband recommended)
- C. Canvas [recommended browsers \(https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Canvas/ta-p/66\)](https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Canvas/ta-p/66)
- D. Microsoft Word
- E. Scientific calculator

## ☰ Course Assignments

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### Lab exercise readings and lecture presentations

#### Course Requirements Checklist

After reading the Course Syllabus and [Student Expectations \(https://www.liberty.edu/institutional-effectiveness/student-expectations/\)](https://www.liberty.edu/institutional-effectiveness/student-expectations/), the student will complete the related checklist found in the Course Overview.

#### Short Answer Response Assignments (2)

Week 2 and Week 4 involve a short response assignment. One purpose of these assignments is to enforce the material through practical application (CLO: C, E; FSLO: SSI 2).

#### Lab Report Assignments (5)

The student will write a brief page lab report for 5 laboratory exercises as exhibited on the schedule (CLO: A, B, C, D, E; FSLO: SSI 1 and SSI 3).

#### Quizzes (3)

Each quiz will cover the Learn material for the assigned module. Each quiz will contain 20 multiple-choice and true/false questions, and have a 1-hour time limit. The student may refer only to his/her personal notes and materials for this course during the assessment (CLO: D; FSLO: SSI 1 and SSI 3).

## ✓ Course Grading

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Course Requirements Checklist	10
Short Answer Response Assignments (2 @ 100 pts ea)	200
Lab Report Assignments (5 @ 100 pts ea)	500
Quizzes (3 @ 100 pts ea)	300
<b>Total</b>	<b>1010</b>

## 🏛️ Policies

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### Mathematical Late Assignment Policy

*Mathematical* assignments that are submitted after the due date without prior approval from the instructor will receive the following deductions

1. Late *mathematical* assignments submitted within one week after the due date will receive a 10% deduction.
2. *Mathematical* assignments submitted more than one week late or after the final date of the course will not be accepted.
3. Discussion board assignments submitted within one week after the due date will receive a 10% deduction.
4. Discussion board submitted more than one week and less than 2 weeks late will receive a 20% deduction.
5. Discussion board submitted more than 2 weeks late will not be accepted.
6. Group projects, including group discussion board threads and/or replies, and assignments will not be accepted after the due date.

Special circumstances (e.g. death in the family, personal health issues) will be reviewed by the instructor on a case-by-case basis.

For other assignments, please refer to the standard Late Assignment Policy, below.

## Late Assignment Policy

Course Assignments, including discussions, exams, and other graded assignments, should be submitted on time.

If the student is unable to complete an assignment on time, then he or she must contact the instructor immediately by email.

Assignments that are submitted after the due date without prior approval from the instructor will receive the following deductions:

1. Late assignments submitted within one week after the due date will receive up to a 10% deduction.
2. Assignments submitted more than one week and less than 2 weeks late will receive up to a 20% deduction.
3. Assignments submitted two weeks late or after the final date of the course will not be accepted outside of special circumstances (e.g. death in the family, significant personal health issues), which will be reviewed on a case-by-case basis by the instructor.
4. Group projects, including group discussion threads and/or replies, and assignments will not be accepted after the due date outside of special circumstances (e.g. death in the family, significant personal health issues), which will be reviewed on a case-by-case basis by the instructor.

## Disability Assistance

Students with a disability and those with medical conditions associated with pregnancy may contact Liberty University's Online Office of Disability Accommodation Support (ODAS) at [LUOODAS@liberty.edu](mailto:LUOODAS@liberty.edu) for accommodations. Such accommodations require appropriate documentation of your condition. For more information about ODAS and the accommodations process, including how to request an accommodation, please visit <https://www.liberty.edu/online/online-disability-accommodation-support/> (<https://www.liberty.edu/online/online-disability-accommodation-support/>). Requests for accommodations not related to disabilities or pregnancy must be directed to the Registrar's Office, which generally handles medical needs support.

If you have a complaint related to disability discrimination or an accommodation that was not provided, you may contact ODAS or the Office of Equity and Compliance by phone at (434) 592-4999 or by email at [equityandcompliance@liberty.edu](mailto:equityandcompliance@liberty.edu). Click to see a full copy of Liberty's [Discrimination, Harassment, and Sexual Misconduct Policy](https://www.liberty.edu/media/1226/Liberty_University_Discrimination_Harassment_and_Sexual_Misconduct_Policy.pdf) ([https://www.liberty.edu/media/1226/Liberty\\_University\\_Discrimination\\_Harassment\\_and\\_Sexual\\_Misconduct\\_Policy.pdf](https://www.liberty.edu/media/1226/Liberty_University_Discrimination_Harassment_and_Sexual_Misconduct_Policy.pdf)) or the [Student Disability Grievance Policy and Procedures](http://www.liberty.edu/media/8021/Disability_Grievance_Procedures.pdf) ([http://www.liberty.edu/media/8021/Disability\\_Grievance\\_Procedures.pdf](http://www.liberty.edu/media/8021/Disability_Grievance_Procedures.pdf)).

## Course Attendance

In an effort to comply with U.S. Department of Education policies, attendance is measured by physical class attendance or any submission of a required assignment within the enrollment dates of the course (such as examinations, written papers or projects, any discussion posts, etc.) or initiating any communication with one's professor regarding an academic subject. More information regarding the [attendance policy](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FOnline%2BAttendance%2BAnd%2BNon-Attendance&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613719138&sdata=%2BNBTsPOoXuHAPLfISQRugK7cRSuV6UyC7qD3agf3l2k%3D&reserved=0) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FOnline%2BAttendance%2BAnd%2BNon-Attendance&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613719138&sdata=%2BNBTsPOoXuHAPLfISQRugK7cRSuV6UyC7qD3agf3l2k%3D&reserved=0>) can be found in the [Academic Course Catalogs](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.liberty.edu%2Findex.cfm%3FPID%3D791&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=DjjhMiRBNf%2B2ZJUC8eBd1OdNb26S9ADukODYsilXIA%3D&reserved=0) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.liberty.edu%2Findex.cfm%3FPID%3D791&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=DjjhMiRBNf%2B2ZJUC8eBd1OdNb26S9ADukODYsilXIA%3D&reserved=0>). Regular attendance in online courses is expected throughout the length of the term. Students who do not attend within the first week of a sub-term by submitting a required academic assignment (such as the Course Requirements Checklist, an examination, written paper or project, discussion post, or other academic activity) will be dropped from the course. Students who wish to re-engage in the course are encouraged to contact Academic Advising to discuss their enrollment options. Students who begin an online course, but at some point in the semester cease attending, and do not provide official notification to withdraw, will be assigned a grade of "FN" ([Failure for Non-Attendance](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FUnofficial%2BWithdrawals&data=02%7C01%7Caccollins2%40liberty) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FUnofficial%2BWithdrawals&data=02%7C01%7Caccollins2%40liberty>)).

[.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbaf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=MoMvZdPfza69InuhVHMHAVgu59ZP0Fw45xJTU9PIBrU%3D&reserved=0](https://www.liberty.edu/7Cd91431fa6ac547056b5408d833029e1a%7Cbaf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=MoMvZdPfza69InuhVHMHAVgu59ZP0Fw45xJTU9PIBrU%3D&reserved=0)). Students wishing to withdraw from courses after the official start date should familiarize themselves with the [withdrawal policy](#).

## Grading Scale

A	B	C	D	F
900-1010	800-899	700-799	600-699	0-599

For courses with a Pass/NP final grade, please refer to the Course Grading section of this syllabus for the assignment requirements and/or point value required to earn a Passing final grade.

## Add/Drop Policy

The full policy statement and procedures are published in the [Policy Directory](#) (<https://wiki.os.liberty.edu/display/IE/Dropping+and+Adding+Online+Classes>).

## Honor Code

Liberty University comprises a network of students, Alumni, faculty, staff and supporters that together form a Christian community based upon the truth of the Bible. This truth defines our foundational principles, from our Doctrinal Statement to the Code of Honor. These principles irrevocably align Liberty University's operational procedures with the long tradition of university culture, which remains distinctively Christian, designed to preserve and advance truth. Our desire is to create a safe, comfortable environment within our community of learning, and we extend our academic and spiritual resources to all of our students with the goal of fostering academic maturity, spiritual growth and character development.

Communities are predicated on shared values and goals. The Code of Honor, an expression of the values from which our Doctrinal Statement was born, defines the fundamental principles by which our community exists. At the core of this code lie two essential concepts: a belief in the significance of all individuals, and a reliance on the existence of objective truth.

While we acknowledge that some may disagree with various elements of the Code of Honor, we maintain the expectation that our students will commit to respect and uphold the Code while enrolled at Liberty University.

Adherence to the principles and concepts established within facilitates the success of our students and strengthens the Liberty community.

The Code of Honor can be viewed in its entirety at <http://www.liberty.edu/index.cfm?PID=19155> (<http://www.liberty.edu/index.cfm?PID=19155>).

## Schedule

When	Topic	Notes
Module 1: Week 1	Learn	Read: 2 items Watch: 1 item
	Apply	Course Requirement Checklist Class Introduction Quiz: Introduction to Graphing and Lab Safety
Module 2: Week 2	Learn	Read: 1 item Watch: 1 item

When	Topic	Notes
	Apply	Short Answer Response: Kinematics Assignment Lab Report: Kinematics Assignment
<b>Module 3: Week 3</b>	Learn	Read: 1 item Watch: 1 item
	Apply	Lab Report: Projectile Motion Assignment
<b>Module 4: Week 4</b>	Learn	Read: 1 item Watch: 1 item
	Apply	Short Answer Response: Newton's Laws Assignment Quiz: Newton's Second Law
<b>Module 5: Week 5</b>	Learn	Read: 1 item Watch: 1 item
	Apply	Lab Report: Sound and Resonance Assignment
<b>Module 6: Week 6</b>	Learn	Read: 1 item Watch: 1 item
	Apply	Lab Report: Series and Parallel Circuits Assignment
<b>Module 7: Week 7</b>	Learn	Read: 1 item Watch: 1 item
	Apply	Lab Report: Magnetism Assignment
<b>Module 8: Week 8</b>	Learn	Read: 1 item Watch: 1 item
	Apply	Quiz: Refraction of Light