Syllabus: PHY2048L- Physics 1 Laboratory Course

Fall semester 2023

Welcome to PHY2048L – Physics IL

This course is part of the STEM core, a set of six critical and foundational courses consisting of mathematics, chemistry, physics, programming, and STEM applications. These courses build the skills and conceptual understanding you need to succeed in all degree programs. Data show that completing these courses in your freshman (first) year is the ticket to a high-powered STEM degree and an on-time graduation.

The STEM core courses, while not the same, share a similar feel and similar course policies. Moreover, the courses strive to set consistent expectations of what it means to take responsibility for your own learning and how to do university-level work. The courses are designed to be fair and reasonable. They are challenging, but they will set you up for success in your chosen degree program.

As a sign of the importance Florida Poly places on these courses, key department chairs and faculty have come together to form a Freshman Council that collectively manages course standards and delivery. We recognize the enormous impact these courses have on your future academic success. Please note the various resources that are available if you find yourself struggling in any way. Make these courses a priority!

Academic Integrity

All students are expected to adhere to the highest standards of academic integrity. Violations of academic integrity include actions such as cheating, plagiarism, use of unauthorized resources, illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. It is critical that students take a professional approach to their academic work. The faculty and administration take academic integrity very seriously. Suspected violations will be fully investigated, possibly resulting in an academic integrity hearing and sanctions against the accused student if found in violation. Sanctions range from receiving a zero on the exam or assignment, to expulsion from the university. Repeat offenders are subject to more severe sanctions and penalties. Do not compromise your integrity for a perceived short-term gain. More information about Florida Poly's academic integrity policies and procedures can be found here:https://floridapoly.edu/wp-content/uploads/2017/07/FPU-5.005-Academic-Integrity-7.29.14.pdf#search=academic%20integrity

Instructor Information

Instructor: XXXXXXX
Email: xxxxx@floridapoly.edu
Office Hours: xxxxxxxx

Course Information

Course Number and Title: PHY2048L – Physics IL
Meeting time: xxxxxxxx
Credit Hours: **1**
Current Academic Term: **Fall** 2023

- **Official Catalog Course Description:** This laboratory experience for PHY 2048 Physics 1 with Analytic Geometry and Calculus 1 provides practical applications of Newtonian mechanics.
- **Course Pre and/or Co-Requisites:** PHY 2048- Physics 1
- **Communication/Computation Skills Requirement (6A-10.030): N**
- **Required Texts:** No Textbook Required. PhET Simulation, PASCO Capstone software (available with student licenses) and Microsoft word document (to be prepared by the student) for Lab Report Submission
- **Equipment and Materials: (e.g. supplies and software)**
    - PASCO Laboratory Experiment Stations, Universal Interface, Capstone Software, Whiteboard Instruction, Demo experiments, Virtual (PhET) simulations.
- **Course Objectives:**
  Upon successful completion of this course, you should be able to:
    - Demonstrate the ability to perform experiments relevant to Physics 1 concepts
    - Analyze the data obtained from the laboratory experiments
    - Interpret the results and graphs based on the defined Physics Laws and Principles
    - Write Lab reports
- **Metacognitive Learning Outcomes (MLO)**
    - Identify the Physics lab experimental objectives and correlate with the previously learned concepts from the lecture classroom.
    - Apply the concepts and Physics laws/principles acquired from the lecture classroom to the lab experiment.
    - Compare and contrast the lab experimental data, results, figures, graphs and calculations with the theoretical and accepted values and information.
    - Evaluate the error percentage obtained from the experimental and theoretical/accepted values and conclude the validity of the lab experiment.
    - Infer the functioning of the Physics laws and principles from agreement between measured macroscopic values and predicted values of idealized systems through the lab experiments.
    - Construct the lab experimental setups based on the given schematics, drawings, instructions, and handouts and synthesize the experimental data, results, and information.
- **Alignment with Program Outcomes: Include alignment with General Education Competency; ABET Student Outcomes; or another professional standard, if applicable, e.g. This course supports General Education competency for scientific reasoning. Program Learning Outcomes and General Education Competencies may be found in the Academic Catalog (http://catalog.floridapoly.edu/). Additionally, outcomes may be aligned with level of difficulty per Bloom's taxonomy (see University's Institutional Effectiveness Manual for Academic programs).**

SLO Table

Course Learning Outcome	Learning Level (e.g. Bloom's, Anderson/ Krathwohl; Rogers/Hatfield (ABET Assessment Example)	Program Learning Outcome (ABET, GenEd, Other)
Demonstrate the skills in performing laboratory experiments.	Remember Recognize Recall	1, 6
Generate, read, and interpret graphs and data	Apply and Analyze Execute Implement Differentiate Organize	3

Calculate the error analysis from experimental results and theoretical known values.	Understand Interpret Compare Explain	1
Apply principles of scientific inquiry	Evaluate Check Critique	1, 3

Instructional Methods

- Demonstration of Laboratory experiments with hands-on training experience, Whiteboard instruction, Power Point presentations, PhET simulations

Physical Inventory of Equipment for Practical Experience (lab equipment):

- PASCO Laboratory Equipment with Universal Interface, Capstone Software for analysis, graph plotting, analysis, and reporting.

Resources and Reference Materials:

- PASCO Licensed CAPSTONE software.
- Instructor's Handouts.
- PhET Simulations links.

Grading Scale

Grade	A	B+	B	B-	C+	C	D	F
Percentage	90%	87%	83%	80%	77%	70%	60%	< 60%
GPA	4.0	3.33	3.0	2.67	2.33	2.0	1.0	0.0

Assignment/Evaluation Methods

Attendance and participation in lab	05% *
Pre-Lab, In-Lab, Post Lab Quizzes, and simulations.	20%
Mid Term Exam	15%
Laboratory Reports Submission	40%
Final Exam	20%
Total	100%

* Attendance in lab is mandatory, Unexcused absences result in a zero grade for the attendance and report.

- **LAB REPORT SUBMISSION:** A laboratory report will be required covering the work in each lab session. These reports will include tables of data, graphs, and a description of what you did during the lab and answers to the questions. In general, the lab reports have a due date set by your course instructor in CANVAS. Lab reports will not be accepted late unless you succeed in convincing the instructor that you have a special problem. All the lab reports will be considered to secure 40% of your final grade. The instructions and format of submitting the lab report are given below.

- **General Remarks of Lab Report:** Writing a lab report is the only way your instructor will know what you have done during the lab and how well you have understood the process and the results. Part of your lab experience should be learning how to organize and present your work in a scientific way. There is no framework that can be used as a "one size fits all", therefore this lab report framework below should only be used as an example.

- **Any lab report should have the following features:**
  - It should be concise but should also contain the necessary details and well-developed explanations.
  - It should be organized. You should enable the reader to quickly find the information he or she may be interested in.
  - It should contain all the relevant information and reasoning. You should enable the reader to validate your conclusion.

- No plagiarism is encouraged as it is against the ethical principles.

- A possible way to achieve this is using the following framework:
  - **Title of the Lab;** Team Members involved; Instructor Name; Date of Experiment performed; Date of Submission
  - **Objective:** State what you want to achieve in this experiment. A formal way to do this is to state a question or hypothesis that you want to address.
  - **Method:** You should include a summary of the lab procedure in your words; do not merely copy what is in the manual or Pasco Capstone Software. This section should demonstrate your understanding of what exactly you measured and how you measured it.
  - **Data tables, graphs, calculation:** In this section you should include the raw data you measured (generally, an estimate of the error should accompany all measured values) and all your answers to the questions asked within the Pasco Capstone software. Be sure to present your data in an organized manner (e.g. a data table) and to include units. You are expected to save the results as a screen capture jpeg from your Pasco Capstone software and insert it into your word document report at the appropriate position.
  - **Uncertainty & Error:** You cannot draw any final conclusions from your data until you think carefully about how well you can trust your data and what factors may have affected or biased it. Additionally, you must often propagate the error from your measurements through your calculations and graphs.
  - **Conclusion:** Finally, after all this work, go back and answer the question you stated in the beginning. Does your data allow you to support or reject your hypothesis, or is the data inconclusive? Also do you have anything you can compare your results with (e.g. a value in the literature, a second measurement, a measurement with a different method, other lab groups)? How well does it compare to such a value?
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- MODEL RUBRICS FOR LAB REPORT SUBMISSION:

Lab Report Submission Rubric

Criteria	Ratings	Pts
Report Format (Title, Student and Partner Name, Etc.).	1 = Everything Complete. 0.75 = 1 Format (Title, element missing. 0.5 = 2 elements. 0 = No title, no author and Name, Etc.).	1.0 pts
Objective	1 = Objective is correct and clearly stated.0.75 = Missed point of the Objective. 0 = Objective is missing from the report.	1.0 pts
Method	1 = Enough information for the unfamiliar reader to understand how you did the experiment. List of equipment. 0.75 = Statement of procedure is incomplete. 0.5= No statement of procedure or missing equipment list. 0 = Method is missing from the report.	1.0 pts
Data tables, graphs, calculation & Error Analysis	5 = All slides, tables, graphs are shown in their proper order, and all questions satisfactorily answered. -0.25 for each Data table error incorrectly answered question. -0.5 for graphs, calculation, each missing graph or table. -1.0 for each missing slide. 0 = This section is missing from the report. -1.0 if slides are out of proper order.	5.0 pts
Uncertainty and Error Discussion	1 = identified significant contributions to uncertainty and error and quantified impact on results; 0.75 = identified significant	1.0 pts

Lab Report Submission Rubric		
Criteria	**Ratings**	**Pts**
	contributions to uncertainty and error but didn't quantify impact on results; 0= No uncertainty and error report with the laboratory report submission	
Conclusion	1 = Summary report of the laboratory observation and conclusion of the experimental results supporting with underlying Physics concepts; 0.75 = Summary report supported with inappropriate Physics concepts or principles; 0 = No summary report with the laboratory report submission	1.0 pts
Total Points:		10.0

- **CANVAS Policy:** Assignments, announcements, and information will be posted on CANVAS. **Students are responsible for checking CANVAS regularly to be aware of their assignments** and other class information.

- **Late Work/Make-up work**: All class assignments will have due dates communicated at the time of assignment. Acceptance of late or make-up work is at the instructor's discretion. Decision will be made on a case-by-case basis in accordance with university policy. **It is the student's responsibility to know the deadlines and turn work in ON TIME.**

Schedule of Topics by Week

Week	Chapters/Topics	Assignments
Week 1	Introduction and Syllabus Introduction/review of Capstone Software for data collection, and Universal Interface Hardware Functions	
Week 2	Lab 1: Error Analysis and Plotting Graphs	
Week 3	Lab 2: Introduction to Measurement – Simple Pendulum	Lab 1 Report Submission
Week 4	Lab 3: Velocity and Acceleration - Part A	Lab 2 Report Submission
Week 5	Lab 4: Vector Addition (Graphical) and Force Table	Lab 3 Report Submission
Week 6	Lab 5: Equations of Motion for Constant Acceleration	Lab 4 Report Submission
Week 7	**Mid Term Lab** – Force and Acceleration	Mid Term Lab Report Submission (In Class)
Week 8	Lab 6: Projectile Motion	Lab 5 Report Submission
Week 9	TBD	
Week 10	Lab 7: Atwood's Machine	Lab 6 Report Submission
Week 11	Lab 8: Coefficients of Friction	Lab 7 Report Submission
Week 12	Lab 9: Impulse and Momentum	Lab 8 Report Submission
Week 13	Lab 10: Work-Energy Theorem	Lab 9 Report Submission
Week 14	Lab 11: Newton's 2nd Law for Rotation	Lab 10 Report Submission
Week 15	**Lab Final** Standing Waves	Lab 11 Report Submission Final lab report
Week 16	Make Up Lab: Hooke's Law and Elastic Potential Energy	
Week 17	Finals Week	

Course Policies

Attendance

- Students in face-to-face courses are expected to attend all of their scheduled University classes and to satisfy all academic objectives as defined by the instructor. (University Policy, FPU-5.0010AP) (see also University Policy).
- A+ Attendance will be used to track attendance.

- Note: Falsifying attendance for yourself or for another student is an act of academic dishonesty and is considered a violation of the university's academic integrity policy.

Students Feeling Sick

Students should not come to class if they are feeling ill, particularly if experiencing symptoms of COVID-19, or if you have been directed by a health professional to quarantine. Students who are experiencing an emergency situation that aligns with an academic exercise of consequence (e.g./a Common Exam) should work with CARE Services at care@floridapoly.edu

Late Work/Make-up work

Make-up exams will be given only in extreme circumstances with a documented excuse. If you will miss an exam because you are participating in a college-sponsored activity, inform your instructor before the exam and provide them with documentation. Late homework will receive a 20% penalty if received up to one day late. Homework received more than one day after the due date will not receive credit.

Official Email Address

Florida Polytechnic University email is the official method of communication for the University. Students are required to check their email frequently (at least once per day). We cannot reply to any email received from an address other those that end in floridapoly.edu.

Midterm Exams

Midterm exam dates will be finalized early in the semester and those dates/times will be posted to our Canvas course site once available. Exam dates are subject to change and you should refer to the Academic Calendar website for the most up-to-date exam schedules. Exam dates will also be announced in class at least one week prior to the scheduled event

Academic Support Resources

- **Library**: Students can access the Florida Polytechnic University Library through the University website and Canvas, on and off campus. Students may direct questions to Academic Success Center success@floridapoly.edu or by email, library@floridapoly.edu.
- **Peer Learning Strategists**: These are specially trained student leaders who help their peers strategize approaches to course content and work through solution methods. PLS students work in collaboration with the courses they support so the content and methods are aligned with your instructors' expectations. The PLS room is located on the first floor of the IST in the center hallway.
- **Writing Center**: Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit https://floridapolytechnic.libguides.com/writingservices.

University Policies

Reasonable Accommodations

Florida Polytechnic University is committed to assisting students with disabilities and offering reasonable accommodations to those with documented eligibility. The Office of Disability Services (ODS) coordinates accommodations for students with disabilities in accordance with the ADA Amendments Act of 2008 (ADAAA), the Americans with Disabilities Act of 1990 (ADA), and Section 504 of the Rehabilitation Act of 1973. Reasonable accommodations are determined on an individual basis through an interactive process between you, ODS, and your instructor(s). If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course and communicate with your instructor about

your approved accommodations at your earliest convenience. If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible.

The Office of Disability Services (ODS):
DisabilityServices@floridapoly.edu
(863)874-8770
ASC East building
ODS website: www.floridapoly.edu > Student Affairs > Health Wellness > Disability Services

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. It is important for you to know that there are resources available if you or someone you know needs assistance. You may speak to your professor, but your professors have an obligation to report the incident to the Title IX Coordinator. It is an educational goal that you feel able to share information related to your life experiences in classroom discussions and in one-on-one meetings. However, it is requirement for university employees to share information with the Title IX Coordinator regarding disclosure. However, please know that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment.

Student Record of Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use.

Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidently, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action).

Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers ***is prohibited****.*