Structure of Physics I Lab

CP 2221

Summer 2023

Course Schedule: Mon-Wed., 1:00 pm

Room: Natural Science Building S-S108

Instructor: Wei Shi

Email: shiw@oldwestbury.edu

# Course Description:

This is the lab associated with the first course in the Structure of Physics sequence. Students will perform experiments to test the principles of mechanics: vectors, kinematics, forces, work, energy, momentum, and rotational motion. Students will learn how to take data accurately and scientifically. They will learn how to analyze and use the data to demonstrate hypothesis and to objectively draw conclusions. Students enrolled in CP 2221 Structure of Physics I Lab should concurrently enroll in the associated lecture course, CP 2220 Structure of Physics I.

Co-requisites: CP 2220

# Course Materials:

This course uses Open Educational Resources (OER) in place of commercial learning material. SUNY Old Westbury and the State University of New York are committed to expanding the use of open educational resources for students. **Worksheets with instructions, data tables, and questions for each experiment will be distributed in class or via blackboard.**

* PhET Interactive Simulations, University of Colorado Boulder (<https://phet.colorado.edu>)
* Office 365: This course will make use of Microsoft Office and Excel. Access is provided by the university (<https://www.office.com>). Use your university credentials to log in.
	+ Google docs and google sheets or libre office (<https://www.libreoffice.org/>) can be used as alternatives to office 365.
* (optional): Mathematica (<https://www.oldwestbury.edu/it/faq/help-mathematica>)

# Student Learning Outcomes:

* Students will be able to apply the scientific method by applying mathematical analysis to data to test hypothesis and demonstrate physical phenomena.
* Students will be able to use a variety of scientific equipment to collect, evaluate and interpret experimental data.
* Students will be able to communicate scientific ideas and information in writing.
* Students will gain familiarity with the vocabulary, unifying principles, and tools of physics.

# Program Student Learning Outcomes:

* B.S. in Biochemistry
	+ PSLO 1 – Knowledge: Students will demonstrate a mastery of course concepts and integrate knowledge in biochemistry, biology, analytical, inorganic, organic and physical chemistry.
	+ PSLO 2 – Lab Skills: Students will apply laboratory techniques and instrumentation skills to safely perform experiments.
	+ PSLO 3 – Critical Thinking: Students will apply critical thinking, mathematical and reasoning skills to biochemical problem solving, analysis of data, and evaluation of scientific information.
	+ PSLO 4 – Communication: Students will effectively communicate in oral and written formats and will become proficient searching scientific databases and processing information.
* For B.A. in Chemistry:
	+ PSLO 1 – Knowledge: Students will demonstrate a mastery of course concepts and integrate knowledge in analytical, biochemistry, inorganic, organic and physical chemistry.
	+ PSLO 2 – Lab Skills: Students will apply laboratory techniques and instrumentation skills to safely perform experiments.
	+ PSLO 3 – Critical Thinking: Students will apply critical thinking, mathematical and reasoning skills to problem solving, analysis of data, and evaluation of scientific information.
	+ PSLO 4 – Communication: Students will effectively communicate in oral and written formats and will become proficient searching scientific databases and processing information.

# Course structure:

This course is taught in person. The course meets 3 times a week, with a different experiment each day. The instructor will give an introductory lecture to the experiment, after which the students will work in groups of three or less to complete the weekly experiment. A worksheet with instructions, data tables, and questions will be distributed with each experiment. The worksheets must be signed by the professor at the end of class. While the experiment is performed as a group, each student will be responsible for completing and turning in their own worksheet. In addition to the worksheets, students will write lab reports throughout the semester.

The instructional method for all your courses was indicated on the Course Schedule when you registered (On-Campus, Hybrid/Blended, Online or Remote). Our commitment to deliver instruction in accordance with the respective method is identified in the description for the course. For example, Remote courses are described as, “a distance course with all instruction conducted during scheduled class meeting times via an online conferencing platform.” Please be advised that changes in the Campus Engagement Level may impact campus operations including course instruction. Please regularly check Blackboard and your Old Westbury email for important announcements.

## Lab Schedule:

|  |  |  |
| --- | --- | --- |
|  | Experiment |  |
| 1 | Measurements |  |
| 2 | Introduction to Graphical Analysis - Measuring Pi |  |
| 3 | Vectors and Equilibrium |  |
| 4 | Vector Addition - simulation |  |
| 5 | Galileo’s Acceleration Hypothesis |  |
| 6 | Projectile Motion |  |
| 7 | Atwood's Machine |  |
| 8 | Friction |  |
| 9 | Conservation of Energy - simulation |  |
| 10 | Ballistic Pendulum |  |
| 11 | Collisions - simulation |  |
| 12 | Circular Motion |  |
| 13 | Torque and Center of Gravity |  |

# Grading policy:

The overall grade will be based off the experiments and lab reports according to the following weights 80% experiments, 20% lab reports.

* Experiments: For each experiment, a weekly experiment grade will be assigned for performing the experiment and correctly completing the worksheet. The overall experiment grade is the average of each weekly experiment grade, with the lowest grade dropped from the average. The worksheet must be signed by the professor at the end of class.
* Lab reports: The lab reports will include the data taken from the experiments/simulations, the corresponding analysis, and conclusions based on the data and analysis.
* Grading scale: Letter grades will be assigned based on the following grading scale, with the lower percentage being inclusive and the upper percentage being non-inclusive.

|  |  |
| --- | --- |
| Letter Grade | Percentage |
| A | 93 – 100 % |
| A− | 90 – 93 % |
| B+ | 87 – 90 % |
| B | 83 – 87 % |
| B− | 80 – 83 % |
| C+ | 77 – 80 % |
| C | 73 – 77 % |
| C− | 70 – 73 % |
| D+ | 67 – 70 % |
| D | 63 – 67 % |
| D− | 60 – 63 % |
| F | 0 – 60 % |

## Late policy:

* Experiments: The experiments change each week and are difficult to make up. If the experiment is missed for a legitimate reason, a make-up can be arranged in advance at the discretion of the professor.
* Worksheets: The worksheets must be signed by the professor at the end of class and are due the following class. Worksheets can be turned in up to one week late with a 10% reduction in score. Extensions can be granted for a legitimate reason at the discretion of the professor. Any extension must be requested before the deadline.
* Lab reports: Late lab reports will not be accepted. Extensions can be granted for a legitimate reason at the discretion of the professor. Any extension must be requested before the deadline.

# Other information:

## Campus-wide Protocols - Masks and Social Distancing:

To protect the health of everyone in this class, all students are required to wear a mask while inside campus buildings. Your mask must adequately cover both your nose and mouth. This is in keeping with the College’s fall 2021 policy (all students, faculty, staff and visitors no matter their vaccination status will be required to wear face masks in all indoor spaces). Refer to Guidance Section 2: Campus-wide Protocols – Masks and Social Distancing (<https://www.oldwestbury.edu/covid#covidoperations>). A student who comes to class without a mask will be required to leave to obtain one before returning to class. A limited number of masks may be available at designated locations on campus. Any student who refuses to wear a mask may not enter the classroom nor participate in the class. There will be no exemptions or waivers of the 100% compliance mask policy. Continued refusal to wear a mask or face covering will be reported to the Office of Student Conduct. Masks are for both your own and for others' safety and wellbeing- please remember our campus commitment to care for each other, to Defend the Den, and take this simple step to protect yourself and our OW community. In light of the FDA’s full approval of the first COVID-19 vaccine, vaccination is now also mandated on our campus. Vaccinations and masking are how we together, Defend the Den.

## Blackboard and E-mail:

Course documents will be posted on the Blackboard website, accessible from the Old Westbury web site (<https://connect.oldwestbury.edu/>) or directly at (<https://bboldwestbury.sln.suny.edu/>). If you need login help for the Old Westbury intranet or help accessing course information, visit the computer lab, or the Student Computing section of the College website (www.oldwestbury.edu). I will communicate with you through your Old Westbury email.

## Grade of Incomplete:

The College bulletin allows faculty to assign a grade of Incomplete when circumstances such as accident or illness make it impossible for the student to complete course work by the end of the semester as long as the student has completed most of the course work at a passing level. The grade of “I” cannot be used to allow students to “try again” the following semester.

## Withdrawal/No Credit:

The College bulletin (<https://www.oldwestbury.edu/division/office-academic-affairs/office-registrar/class-schedule>) gives the deadline for withdrawal without a faculty signature, and the last day for withdrawal with a signature. For lecture and laboratory withdrawals, students are advised that if, before the 7th week of the semester, you withdraw from this lecture course, then you should also withdraw from the laboratory course. Withdrawals after the 7th week should be discussed with both your lecture and laboratory instructors. A grade of “NC” will be accepted only if prior arrangements have been made with the instructor and a fully executed Credit/No Credit agreement has been electronically filed, before the end of the seventh week of classes.

## Academic Integrity:

Plagiarism is presenting the work of others as if it is our own. Providing or receiving exam questions or answers to another person or entity is academic dishonesty. Plagiarism and other academic dishonesty, such as cheating on an exam, will be punished by a grade of F (failure) in the course and will be reported to the Dean. Know what academic dishonesty is and how to avoid it - in this matter, ignorance is never an acceptable excuse. Further details can be found in the Student Code of Conduct and on the College website: https://www.oldwestbury.edu/policies/conductbehaviour/code-student-conduct.

## ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES:

If you have a physical, psychological, medical or learning condition that may impact your course work, please contact Stacey DeFelice, Director, Office of Services for Students with Disabilities (OSSD), NAB 2065, Phone: 516-628-5666, Email: defelices@oldwestbury.edu.

The office will help you determine if you qualify for accommodations and assist you with the process of accessing them. All support services are free and all contacts with the OSSD are strictly confidential. SUNY Old Westbury is committed to assuring that all students have equal access to learning activities and social activities on campus. <https://www.oldwestbury.edu/academics/support/OSSD>