Stony Brook University

Last Updated 1/15/25

PHY 122.90: Physics for the Life Sciences II

Physics and Astronomy

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Course Information

Course Title: Physics for the Life Sciences II
Course Designator, Section: PHY 122.90
SBC Designation: SNW
Credits: 4
Pre-requisite: C or higher in PHY 121
Pre- or corequisite: CHE 132 or CHE 152
Semester, Year: Spring 2026
Modality: In-person, "studio setting"
Meeting Times:

Lecture: MW 8:00 am – 9:20 am
Lab: F 8:00 am – 9:50 am
Midterm #1: M February 23, 8:15 - 9:35 pm
Midterm #2: M April 6, 8:15 - 9:35 pm
Final exam: R May 14, 2:15 - 5:00 pm

Classroom Location: Physics P-118

Instructor Information

Instructor Name: Gillian Winters
Instructor Email: gillian.winters@stonybrook.edu
Office Hours: to be announced on Brightspace
Office Location: Physics A-138B
TA Contact Info: to be announced on Brightspace
TA Office Hours: to be announced on Brightspace
Physics Help Room: Physics room A-131, daily 9:00 am – 6:00 pm

Required Course Materials

Mastering Physics and Electronic Textbook: You must have a Mastering Physics license for the course. This is obtained via the "MasteringPhysics" link from the "Table of Contents" of the Brightspace course. This semester, we will be following the textbook "College Physics, a Strategic Approach", 4th edition, by Knight, Jones, and Field.

Homework: Homework is required and will be assigned via the online "Mastering Physics", above, through Brightspace.

Scientific calculator: required for classwork, homework, labs, and exams. Must have trig functions (sin, cos, tan). Calculators and other devices that can access the internet are not permitted during tests and are discouraged during class and lab exercises.

In-Class Clicker questions via Vevox: Vevox replaces past clicker question formats and is free for all students**.** Vevox clicker questions are accessed via the link on Brightspace.

Course Description

Second part of an introduction to physics with applications to biology, primarily for students majoring in biological sciences or pre-clinical programs. Topics include electromagnetism, optics, acoustics, and radiation phenomena. Strong algebra skills and knowledge of the ideas of calculus are required. Three lecture hours and two laboratory hours per week.

This course is structured in the "Studio Physics" format, whereby lecture and group problem solving are integrated throughout class sessions. Students will be asked to work in problem-solving groups at the whiteboards at the perimeter of the room at various times during lectures. Your active participation is a critical part of the learning process.

Learning Objectives

By the end of the semester, students will be able to:

- LO1: Demonstrate qualitative and quantitative mastery of physics concepts related to electrostatics, electric circuit theory, magnetostatics, electromagnetism, reflection, refraction, geometric optics, diffraction, interference, and atomic and nuclear physics.
- LO2: Critically evaluate physical parameters and apply appropriate physics concepts to analyze problems in classical physics.
- LO3: Demonstrate the ability to apply algebraic mathematical reasoning and basic calculus concepts in solving quantitative physics problems.
- LO4: Demonstrate proficiency in science process skills by planning and performing experiments to measure physical phenomena and minimize experimental error.
- LO5: Demonstrate scientific communication skills through thoughtful discussion, collaborative problem solving, and dissemination of experimental results.
- LO6: Understand the methods scientists use to explore natural phenomena including observation, hypothesis development, measurement and data collection, experimentation, and evaluation of evidence.
- LO7: Understand the natural world and the major principles and concepts that form the basis of knowledge in the natural sciences.
- LO8: Assess scientific information and understand the application of scientific data, concepts, and models in the natural sciences.
- LO9: Make informed decisions on contemporary issues involving scientific information.

Stony Brook Curriculum (SBC) Learning Objective: SNW (Study the Natural World)

- Explain the methods scientists use to explore natural phenomena including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of data analysis or mathematical modeling.
- Explain the application of scientific data, concepts, and models in one of the natural sciences.

What If You Have a Question?

- **When To Email the Instructor**
  Email the Instructor to notify that you are addressing an emotional, physical, or medical challenge via the Student Support Team and may need accommodations.

- **When To Email the Teaching Assistant**

  Email the Teaching Assistant regarding making up a lab. Labs are a required component of this course. All lab grades count; none are dropped. If you have an excused absence for missing your lab (emotional, physical, or medical, and verified via the Student Support Team) you must arrange to make up the lab with the course TAs. Make-ups will then be schedule in one of the two weeks marked as "Make-up" in the lab schedule. A maximum of one lab may be completed per make-up lab date.

  Attending Office/Student Hours
  Attending office hours in the Physics Help Room is strongly encouraged, and you may come alone or with fellow students. The Physics Help Rooms are located on the A-level of the Physics Building (A-129 and A-131). The hours are approximately 9:00am–6:00pm, Monday to Friday. Teaching assistants, teaching staff, and faculty will be available for extra help.
  You may also request one-on-one or small group tutoring from the Academic Success and Tutoring Center in the Stony Brook Union:
  https://www.stonybrook.edu/commcms/academic_success/students/index.php#APPOINTMENTS(ASTC).

Assessments

Assessment/Assignment/Exam	Percentage	Due Date
Homework	10	Weekly, 11:59 pm Sunday night
Vevox (Clickers)	10	In class
Lab	25	In class, by end of lab class
Midterm #1	15	8:15 pm 2/23/26
Midterm #2	15	8:15 pm 4/6/26
Final	25	2:15 pm 5/14/26
Total	**100**	

Response Time and Feedback on Assignments

Response time and feedback for all assignments is expected to be one week.

Grade Scale

The grading scale is outlined in the table below. This scale may be adjusted/curved downward depending on cumulative student performance in the course. For example, the threshold for a final A grade may be lower than 90%.

Letter Grade	Percentage/ Points
A	90- 100
A-	86 - 89
B+	82 - 85
B	78 - 81
B-	74 - 77
C+	70 - 73
C	66 - 69
C-	62 - 65
D+	56 - 61
D	50 - 55
F	< 50

These letter grades are threshold scores only. Actual final scores needed to earn a certain letter grade may be lowered if warranted based on the difficulty of the exams. In other words, if your final total points in the course equal a 90%, you will not earn less than an A; however, the threshold for an A may be lower.

Additional information

- Undergraduate Grading System

Course Schedule

The possibility exists that unforeseen events will make schedule changes necessary. Any changes will be clearly noted in Brightspace Announcements or through Stony Brook email.

Monday	Wednesday	Friday
January 26 Ch 17: Wave Optics	January 28 Ch 17: Wave Optics	January 30 Ch 18: Ray Optics
February 2 Ch 18: Ray Optics	February 4 Ch 19: Optical Instruments	February 6 LAB #1: Diffraction
February 9 Ch 19: Optical Instruments	February 11 Ch 20: Electric Fields and Forces	February 13 LAB #2: Refraction
February 16 Ch 20: Electric Fields and Forces	February 18 Ch 21	February 20 LAB #3: Lenses and Mirrors
February 23 Review Ch 17 - 20 **Midterm (Chapters 17 - 20): Monday 2/23 8:15 - 9:35 pm**	February 25 Ch 21	February 27 LAB #4: Electric Field Plotting
March 2 Ch 22	March 4 Ch 22	March 6 LAB #5: Resistance and Ohm's Law
March 9 Ch 23	March 11 Ch 23	March 13 LAB #6: Series and Parallel DC Circuits
March 16 SPRING BREAK – no class	March 18 SPRING BREAK – no class	March 20 SPRING BREAK – no class
March 23 Ch 24	March 25 Ch 24	March 27 LAB #7: Magnetic Forces
March 30 Ch 25	April 1 Ch 25	April 3 – First of two make-up labs Lab make-up date #1
April 6 Ch 21-25 Review **Midterm (Chapters 21 - 25): Monday 4/6 8:15 - 9:35pm**	April 8 Ch 26	April 10 LAB #8: e/m Measurement
April 13 Ch 26	April 15 Ch 27	April 17 LAB #9: Faraday's Law
April 20 Ch 27	April 22 Ch 28	April 24 Ch 28
April 27 Ch 29	April 29 Ch 29	May 1 – Final make-up lab Lab make-up date #2
May 4 Ch 30	May 6 Ch 30	May 8: last day of classes Ch 17 - 30 Review
FINAL EXAM: Thursday May14, 2:15 - 5:00 pm (Chapters 17 – 30)		

Student Success Resources: How to Be a Successful Student in This Course

There are multiple resources, university offices, and help desks that are available to assist you with everything from advising, tutoring, accessibility and much more.

Review some Academic Success Strategies and visit the Student Resources page for links to resources on campus.

Wellness & Support Statement

Stony Brook values student well-being, including mental health, and recognizes that a variety of factors can impact emotional wellness and academic success including stress, anxiety, depression, substance use, sexual violence, family or relationship concerns, and political conflict. Resources are available if you experience challenges or wellness concerns that affect your ability to be successful in class, and you are encouraged to reach out for help when you need it.

In the event of a short-term absence from class, students are encouraged to communicate immediately and work directly with instructors. However, if a student is struggling with an extended absence due a hospitalization, family illness or death, they are encouraged to reach out to the Student Support Team.

Technical Requirements and Assistance

D2L Brightspace is Stony Brook University's digital learning environment. It is used for the facilitation of communications between faculty and students, submission of assignments, and secure posting of grades and feedback in your courses. To access Brightspace, go to mycourses.stonybrook.edu and use your SBU NetID and password. If you are unsure of your NetID, visit Finding Your NetID and Password for more information.

Sometimes submitting coursework via a tablet and/or mobile device can be challenging. Computers equipped with the appropriate software are available for use at the various SINC site computer labs. Both physical and virtual labs are available. You can also borrow a computer through SBU's Laptop Loan Program.

Visit the Technical Requirements page for additional information regarding hardware and software options.

Please use the following information if you need technical assistance at any time during the course or to report a problem with Brightspace:
Brightspace Support via SUNY Helpdesk

- Phone: 1-844-673-6786
- Submit a ticket or chat online

Stony Brook University: Academic Technology Services

- Phone: 631-632-9800
- Email: AcademicTechnologies@stonybrook.edu

Privacy Policies

This course utilizes various educational technologies to enhance the learning experience. You can access links to the privacy policies of the tools and platforms used at Stony Brook University on the Syllabus Addendum webpage.

Course Policies

Late Work Policy

Late work will not be accepted for any reason. One homework grade will be dropped, and one clicker grade will be dropped.

All lab reports are due at the end of each lab session.

Up to two labs that are missed for valid reasons and verified via the Student Support Team may be made up during the scheduled lab make-up dates. Missing (and not making up) one lab will result in your letter grade for PHY 122 being dropped by 1 full letter grade. Missing (and not making up) two labs will result in your letter grade for PHY 122 being dropped by 2 full letter grades. Missing (and not making up) more than 2 labs will result in failing the course.

The registrar's policy is that students are responsible for avoiding exam conflicts, and exceptions will not be granted in this course. If you cannot take a midterm due to exceptional circumstances (documented illness or death in the immediate family verified via the Student Support Team), discuss this with the instructor as soon as possible. Generally, the weights of the other exams will be increased to compensate for the missing midterm but there will not be make-up midterm exams. If you miss the final exam with a valid excuse, you will receive an Incomplete in the course and a makeup final will be scheduled as promptly as possible after the end of the semester.

Attendance Policy

Attendance is required for credit for the Vevox (clicker) questions during each lecture. Attendance is required to complete and receive credit for labs.

University Policies

Student Accessibility Support Center Statement

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.
Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website:
https://ehs.stonybrook.edu//programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities and search Fire Safety and Evacuation and Disabilities.

Academic Integrity Statement

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Professions, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

Understand When You May Drop This Course

If you need to drop or withdraw from the course, it is your responsibility to be aware of the tuition liability deadlines listed on the registrar's Academic Calendar. Before making the decision to drop/withdraw you may want to [contact me or] refer to the University's policies:

- Undergraduate Course Load and Course Withdrawal Policy

Incomplete Policy

Under emergency/special circumstances, students may petition for an incomplete grade. Circumstances must be documented and significant enough to merit an incomplete. If you need to request an incomplete for this course, contact me for approval as far in advance as possible. You should also read the University's policies that apply to you: Undergraduate Bulletin

Course Materials and Copyright Statement

Course material accessed from Brightspace, Zoom, Echo 360, VoiceThread, etc. is for the exclusive use of students who are currently enrolled in the course. Content from these systems cannot be reused or distributed without written permission of the instructor and/or the copyright holder. Duplication of materials protected by copyright, without permission of the copyright holder is a violation of the Federal copyright law, as well as a violation of Stony Brook's Academic Integrity.