



PHY 132.90/134.L90: Studio Physics
Course Syllabus, Spring 2019

Instructor: Laszlo Mihaly Laszlo.mihaly@stonybrook.edu
Class Hours: Monday, Wednesday, Friday 10:00-11:53am
Classroom: Physics P-118
Office Hours: Monday, 2:00-3:00pm in Physics B-145
Graduate TAs: TBA

Undergrad TA: Hongfei Bao, hongfei.bao@stonybrook.edu

I. Course Description

The course is the second part of a two-part sequence intended for majors in the physical sciences and engineering who have a strong background in mathematics and are ready for a fast learning pace. It covers electromagnetism, electric circuit theory and optics. Calculus is used concurrently with its development in MAT 132.

Students taking this section of the PHY 132 course must also be enrolled in PHY132-R90 and PHY134-L90, the laboratory component of the course. The laboratory component will take place on Fridays, but there will be classes every Friday, even if there is not a lab scheduled on that Friday.

This course follows a participatory studio format. Students are expected to attend all classes for which they do not have a reasonable excuse and participate in group activities during the classes. There will be short quizzes (using clickers) during the lecture about the basic concepts. It is recommended that you prepare for every class by reading the relevant chapter in the textbook before coming to class.

We will strictly adhere to the schedule outlined in the course syllabus, see below. If a material is not covered in lecture, students are expected to study it from the book.

II. Course Learning Objectives

1. Students will demonstrate mastery of physics concepts related to electrostatics, electric circuit theory, magnetostatics, electromagnetism, reflection, refraction, geometric optics, diffraction and interference.
2. Students will be able to think critically and apply appropriate physics concepts in analyzing qualitative problems.
3. Students will demonstrate the ability to apply algebraic mathematical reasoning and elements of calculus in solving quantitative physics problems.
4. Students will demonstrate proficiency in science process skills by designing and performing experiments to measure physical phenomena and minimize experimental error.
5. Students will demonstrate scientific communication skills through thoughtful discussion, collaborative problem solving, and dissemination of experimental results.



III. Blackboard, course WEB page

The lab, homework and clicker grades will be accessible on blackboard. The course is listed under **PHY 132.90**. (The PHY 132.R90 and the PHY 134.L90 links are also there, but will not be used.) E-mail messages from the instructors will be distributed via blackboard, so it is important that you register an email address that you check regularly for important course information.

All other information about the course will be posted at <http://solidstate.physics.sunysb.edu/teaching/2018/phy132/>. This includes lab and lecture notes, and solutions to the midterm and final exams.

IV. Required Materials

1. Textbook: Giancoli, Physics for Scientists and Engineers, 4th edition. It is important to have access to the textbook, because, by the structure of this course, there may not be time to cover all required material in class time. There are hard copy and electronic versions of the book, with options to buy or rent, so pick your best option. Keep in mind that you **MUST** have a Mastering Physics subscription either purchased with the book or purchased separately.
2. Homework will be assigned and graded electronically. Use the student access code that comes with the Mastering Physics subscription to register at <http://www.pearsonmylabandmastering.com/northamerica/masteringphysics/students/>. The course ID associated with this course is **PHY13290S19**. When you are asked to enter your Stony Brook ID, please do so accurately. If you do not provide the correct ID, your homework grades will not be transferred to Blackboard.
3. You will need a scientific calculator with trig functions. It can be any kind of scientific calculator, but not a phone, tablet or laptop computer. It cannot have any kind of networking or messaging capabilities. During class you may bring any device you wish, but you should make sure you gain familiarity with the calculator you will be using in exams.
4. We will use Turning Point Technologies clickers, registered on Blackboard.
5. Laboratory notebook

V. Preparation before coming to class (see links on the course WEB page)

1. Before the first lab:
 - a. Read the instructions for writing lab reports and a sample lab report.
 - b. Read the guide to uncertainty and error in measurements.
 - c. Make yourself familiar with the “plotting tool”.
2. Before each lab: Read the lab instructions before coming to a scheduled lab.
3. Before each lecture: Read the relevant chapter/sections of the book.

VI. Homework

Homework problems will be posted on Sundays and they are due 10 days later, on Wednesday evenings at 11:59pm. The problems are posted on the Mastering Physics website under course **PHY13290S19**. When accessing the homework, please register using your student ID number so your grade may be linked to Blackboard. Students will not be penalized for multiple attempts at problems, but there is a maximum of ten submissions for each part of each problem. Late work is not accepted.

The function of homework is to reinforce and apply concepts that you are learning; it is not to write down the correct answer. If you get homework solutions from Google, Chegg, TransTutors, other university web sites with solutions, etc. without working out the solution yourself, you will not get much educational benefit, and you will not be prepared for the exams that carry much more weight towards your final grade.



VII. Laboratory: PHY 134

Laboratory experiments will be conducted during regular class time on Fridays. Brief instructions for each lab will be posted on the course WEB page. The laboratory grade will be based upon participation and successful completion of experiments. For each experiment, students will record 1) the purpose of the experiment, 2) *brief* procedural outline, 3) materials, 4) data and calculations, 5) graphs (where appropriate), 6) error analysis, and 7) conclusions. **The first three sections must be completed before you come to the laboratory:** On the weeks when there is a lab, you must look at the lab instructions **before the class**, and record in your lab book 1) the purpose of the experiment, 2) a procedural outline, and 3) the materials used in the lab. The final four sections will be completed in class. Teaching assistants will check laboratory notebooks at the beginning and the end of each period for completeness and assign points: max 5 points for the preparation of the lab, and max 5 points for the completeness of the work at the end of the lab. This score will make up 50% of your lab grade.

If you do it right, you will be completely done with the lab during class time. However, we still require three formal laboratory reports during the semester. Please follow the instructions in the “Sample lab report” posted on the course WEB page and be accurate and concise with your written work. You will complete one formal report from labs 1-3, one from labs 4-6, and one from labs 7- 9. Each formal laboratory report will be graded on a 10-point scale. Late work will be penalized by subtracting 1 points for each day started. In order to pass the lab course, you must submit a report even if it is so late that it will receive zero points. It is no possible to get a passing grade in PHY 134 without submitting the 3 formal lab reports. Formal lab reports will make up the other 50% of the lab grade.

Lab make-ups: Students *must* complete all labs to receive a passing grade in the course. Make-up labs will be scheduled at the convenience of the TAs or instructors *only with a valid medical or university excuse*.

Working with lab partners: Although you will have the same data as your lab partners, **the remaining portions of the lab report must be completed individually**. Copying the work of another student violates Stony Brook’s Academic Integrity Policy (see below in Section “University and Academic Integrity Statement”). If the instructors find that you have violated this policy, you will receive a zero for the assignment and you will be referred to the Academic Judiciary for disciplinary action.

VIII. Exams

There will be two midterm exams during the regularly scheduled class time in Physics P-118. Students must remain in the classroom for the entire exam period. The final exam is **Thursday, May 16 at 2:15pm – 5:00pm**; the location will be announced.

A printed formula sheet will be provided to you before the exam. You may make hand-written notes on the formula sheet, and bring it to the exam. You may use both sides of the page. You should bring a calculator. Answer each questions legibly, showing all formulas, substitutions and work to receive full credit. Partial credit is given if you write down the correct formula but you cannot complete the numerical calculation. There will be no partial credit if, in addition to the correct one, you also write one or more other equations that have nothing to do with the solution (even if those formulas are correct). To get full credit you have to use the correct unit for each answer. There is no partial credit for the multiple-choice questions.



IX. Grading Structure

The PHY 132 final grades will be determined as follows:

1. Midterm 1: 20%
2. Midterm 2: 20%
3. Final exam: 35%
4. Homework: 15%
5. Clicker participation: 10% (No penalty for wrong answers)

It is not possible to get a grade of C or better if you do not take the final exam. The PHY 134 final grade will be based 50% on the formal lab reports and 50% on the preparation for the lab, the work done during the lab and the notes/calculations made during the labs.

X. Extra Help

We encourage you to seek help as soon as you are having difficulty, since the cumulative nature of the material makes it difficult to catch up if you fall behind. In addition to the office hours of the instructor, Teaching Assistants will be available for in the Help Room in Physics A-131.

XI. Disability Instructions

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, 128 ECC Building (631) 632-6748. 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 Disability Support Services. For procedures and information go to the following web site: <http://www.ehs.sunysb.edu> and search Fire Safety and Evacuation and Disabilities.

XII. University and 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. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>. One person using the clicker of another to simulate participation in class meetings is academic dishonesty, and will be treated as such.

XIII. 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 Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty are required to follow school-specific procedures: http://www.stonybrook.edu/commcms/emergency/critical_incident.shtml.



XIV. Schedule of Topics and Experiments

Homeworks are due Wednesday midnight. Lab reports are due Wednesday morning in class. On the weeks when there is a lab, prepare your lab notebook with the required material before coming to class Friday morning.

Week starting with	Topic	Homework, Lab report	Book Chapter	Monday	Wednesday	Friday
28-Jan	Electric fields, Gauss's law		Ch. 21, 22	L01: 21.1-21.6	L02:21.7-21.11	L03: 22.1-21.4
4-Feb	Electric Potential	HW #1 due	Ch. 23,24	L04: 23.1-23.3	L05: 23.4-23.8	Lab 1: Electric field mapping
11-Feb	Capacitors, currents, resistance	HW #2 due	Ch. 24, 25	L06: 24.1-24.6	L07: 25.1-25.8	Lab 2: Current and resistance
18-Feb	DC circuits	HW #3 due	Ch. 26	L08: 26.1-26.3	L09: 26.4-26.7	Lab 3: Circuits
25-Feb	Review	HW #4 due		L10: Review	L11: Review	Midterm: Ch. 21-26
4-Mar	Magnetic field	Report #1 due: Labs 1,2,3	Ch. 27	L12: 27.1-27.3	L13: 27.4-27.9	Lab 4: Magnetic force
11-Mar	Sources of Magnetic field	HW #5 due	Ch. 28	L14: 28.1-28.4	L15: 28.5-28.10	Lab 5: Electric motor
18-Mar				Spring Break		
25-Mar	Review	HW #6 due	Ch. 29	L16: 29.1-29.4	L17: 29.5-29.7	Lab 6: Faraday's law
1-Apr	Induction	HW #7 due		L18: Review	L19: Review	Midterm: Ch. 27-29
8-Apr	Induction, AC	Report #2 due: Labs 4,5,6	Ch. 30	L20: 30.1-30.4	L21: 30.5-30.9	Lab 7: RCL circuits
15-Apr	Maxwell's equations, light	HW #8 due	Ch. 31, 32	L22: 31.1-31.5	L23: 31.6-31.10	L24: 32.1-32.7
22-Apr	Optics	HW #9 due	Ch. 33	L25: 33.1-33.4	L26: 33.5-33.8	Lab 8: Lenses
29-Apr	Optical instruments	HW #10 due	Ch. 34, 35	L27: 34.1-34.5	L28: 35.1-35.5	Lab 9: Diffraction
6-May	Diffraction and polarization	Report #3 due: Labs 7,8,9 HW #11 due	Ch. 35	L29:35.6-35.11	L30: Review	L31: Review

Final Exam: May 16, 2:15 - 5:00pm, NOT IN CLASSROOM, place tbd