



PHY 131: Classical Physics I for Physical Sciences & Engineering Course Syllabus Fall 2014

Instructors:	Dr. Matthew Dawber Dr. Thomas Weinacht	matthew.dawber@stonybrook.edu thomas.weinacht@stonybrook.edu
Class Hours:	Mondays, Wednesdays, Fridays, 10:00-11:50am	
Classroom:	Physics P-118	
Office Hours:	Dr. Dawber: Wednesday 1:30-3:30PM, Physics B104 Dr. Weinacht: Wednesday 12:00-1:30PM, Physics A102 Dr. Kelly: Monday 12:00-1:30PM, Life Sciences Building 092 Dr. Stephens: Monday 3:00-5:00PM, Thursday 9AM-10AM Physics B134	
Graduate TAs:	Connor Lambert (Monday) Sara Whitaker (Wednesday, Friday) Tim Coluccio (Friday) Robert Krakehl Greg Hsing (Wednesday)	connor.lambert@stonybrook.edu sabrinarwhitaker@gmail.com timothy.coluccio@stonybrook.edu robert.krakehl@stonybrook.edu greghsing@gmail.com
Graduate TAs will be available in the helproom (A129) according to the following schedule: Tim: Thursdays 10am-12pm Sara: Wed 12-1pm Rob: Mondays 10-11am Connor: Mondays 12-1pm		
Undergraduate TAs:	Kevin Link Casey McKenna	kevin.link@stonybrook.edu casey.mckenna@stonybrook.edu

I. Course Description

PHY 131: Classical Physics for Physical Sciences & Engineering I (4 credits). The course is the first part of a two-part sequence intended for majors in the physical sciences and engineering who have a strong background in mathematics. It focuses on the mechanics of point particles and simple oscillators, and emphasizes motion in one and two dimensions and the concepts of force, momentum, energy, kinetic theory, and thermodynamics. Calculus is used concurrently with its development in MAT 131. The material will be addressed concurrently with chapters 1-20 in the required text (Giancoli, below). The course consists of 4 hours of lecture//laboratory and 2 hours of recitation per week. Not for credit in addition to PHY 121/123, 131, or 141.
Corequisite: MAT 125 or MAT 131 or MAT 141 or AMS 151

II. Course Learning Objectives

1. Students will demonstrate mastery of physics concepts related to motion in one and two dimensions, Newton's laws of motion and gravitation, energy, momentum, angular momentum, rigid body motion, wave motion, fluids, heat, kinetic theory, and thermodynamics.
2. Students will be able to think critically and apply appropriate physics concepts in analyzing qualitative problems in classical physics.
3. Students will demonstrate the ability to apply algebraic and calculus-based mathematical reasoning 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. Required Materials

1. Textbook: Giancoli, Douglas C. (2008). *Physics for Scientists and Engineers with Modern Physics* (4th Edition). Addison-Wesley Publishers. ISBN-10: 0136139221, ISBN-13: 9780136139225. You may request a loose-leaf version of this text from the Stony Brook Bookstore. You may also purchase the e-book version from MasteringPhysics. We will cover chapters 1-20 in this course so renting Volume 1 is another option from sites such as Amazon, etc.
2. Along with the text, you **MUST** purchase a MasteringPhysics subscription with student access code; it is available in the Stony Brook University Bookstore and is valid for 24 months: <http://www.pearsonmylabandmastering.com/northamerica/masteringphysics/students/>. The course ID associated with this course is SBPHY131DAWBER. All homework will be assigned and graded electronically.
3. Scientific calculator with trig functions (e.g., TI-83)
4. Turning Point Technologies clicker, which must be registered on Turning Point's cloud-based system
5. Laboratory notebook

IV. Homework

Homework problems will be due Monday evenings at 8:00pm. The problems for the entire semester are posted on the MasteringPhysics website. A MasteringPhysics access code is required to view problems and submit solutions electronically. Students will not be penalized for multiple attempts at problems. Solutions will be discussed in recitation, and will be posted on Blackboard after the due date. Homework will count towards 15% of the final grade for the course.

V. Recitation

The recitation is structured to allow informal discussion of physics topics and accompanying homework problems. The recitation instructor, Dr. Weinacht, will administer occasional quizzes that count towards 10% of the final grade. Completing the homework is necessary for success on the quizzes. Attendance is mandatory. Some laboratory experiments and demonstrations will be performed during recitation periods.

VI. Laboratory: PHY 133

Laboratory experiments are an essential component of learning physics. 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; the final four sections will be completed in class. Teaching assistants will check laboratory notebooks at the end of each period for completeness. In addition, students are required to complete three formal laboratory reports during the semester. Each formal lab report will include the 7 sections listed above, typed with 1" margins, 12-point font, and single-spaced. Include the names of your two lab partners. Please be accurate and concise with your written work. You may complete one formal report from labs 2-4 (due **Friday, September 26**), one from labs 5-7 (due **Friday, October 24**), and one from labs 8-9 (due **Friday, November 21**). Each formal laboratory report will be graded on a 20-point scale. The laboratory grade for PHY 133 will be based upon the completion of *all* experiments and the three formal laboratory reports.

Lab Make-Ups: Students *must* complete all ten labs to receive a passing lab grade. Make-up labs will be scheduled with the TAs or instructors at their convenience.



VII. Exams

There will be two midterm exams - **Friday, October 3 (Chapters 1-8)**, and **Friday, October 31 (Chapters 1-13, cumulative)**. They will be given during the regularly scheduled class in Physics P-118. Students must remain in the classroom for the entire exam period. The final exam (Chapters 1-20, cumulative) is **Thursday, December 11, 2:15-5:00pm**; the location will be announced.

VIII. Grading Structure

Final grades in PHY 131 will be determined as follows:

1. Midterm exams: 15% each
2. Final exam: 35%
3. Homework: 15%
4. Recitation Quizzes: 10%
5. Clicker participation: 10% (including attendance)

IX. Extra Help

Your instructors are available for office hours listed at the beginning of this syllabus. You may also consult the instructors of the parallel section 90, Dr Kelly and Dr Stephens for help in their office hours. You are encouraged 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. Teaching Assistants (TAs) will be available for extra help - please check the departmental schedule for the Help Room.

X. 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.

XI. 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. One person using the clicker of another to simulate participation in class meetings is academic dishonesty, and will be treated as such. 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/>.

XII. 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.



DEPARTMENT OF PHYSICS AND ASTRONOMY

XIII. Schedule of Topics and Experiments

Monday	Wednesday	Friday
August 25 Ch 1: Units, Measurement, Error Ch 2: One-Dimensional Kinematics	August 27 Ch 2: Free Fall Ch 3: Vectors LAB #1: Acceleration – Picket Fence	August 29 Ch 1-3 Review
September 1 NO CLASS	September 3 Ch 3: Projectile Motion, Relative Velocity in Two Dimensions LAB #2: Projectile Motion HOMEWORK #1 DUE	September 5 Ch 1-3 Review
September 8 Ch 4: Newton's Laws of Motion HOMEWORK #2 DUE	September 10 Ch 5: Friction, Drag, Terminal Velocity LAB #3: Newton's Laws – Atwood's Machine	September 12 Ch 4-5 Review
September 15 Ch 5: Circular Motion HOMEWORK #3 DUE	September 17 Ch 6: Gravitation, Orbits LAB #4: Centripetal Force	September 19 Ch 5-6 Review
September 22 Ch 7: Work & Energy HOMEWORK #4 DUE	September 24 Ch 8: Gravitational Potential Energy, Power LAB #5: Conservation of Energy	September 26 Ch 7-8 Review LAB #1 DUE
September 29 Ch 1-8 Review HOMEWORK #5 DUE	October 1 Ch 1-8 Review	October 3 MIDTERM #1
October 6 Ch 9: Linear Momentum	October 8 Ch 9: Two Dimensional Collisions, Center of Mass LAB #6: Conservation of Momentum	October 10 Ch 9-10 Review
October 13 Ch 10: Rotational Kinematics HOMEWORK #6 DUE	October 15 Ch 11: Angular Momentum LAB #7: Angular Momentum	October 17 Ch 10-11 Review
October 20 Ch 12: Static Equilibrium, Elasticity HOMEWORK #7 DUE	October 22 Ch 13: Fluids	October 24 Ch 12-13 Review LAB #2 DUE
October 27 Ch 1-13 Review HOMEWORK #8 DUE	October 29 Ch 1-13 Review	October 31 MIDTERM #2
November 3 Ch 14: Simple Harmonic Motion	November 5 Ch 14: Simple Harmonic Motion LAB #8: Simple Harmonic Motion	November 7 Ch 14 Review
November 10 Ch 15: Waves HOMEWORK #9 DUE	November 12 Ch 16: Sound LAB #9: Standing Waves	November 14 Ch 15-16 Review
November 17 Ch 17, 18: Temperature, Ideal Gases HOMEWORK #10 DUE	November 19 Ch 19: Heat, 1 st Law of Thermodynamics LAB #10: Thermodynamics Simulations	November 21 Ch 17-19 Review LAB #3 DUE
November 24 Ch 20: 2 nd Law of Thermodynamics HOMEWORK #11 DUE	November 26 NO CLASS	November 28 NO CLASS
December 1 Ch 1-20 Review	December 3 Ch 1-20 Review HOMEWORK #12 DUE	December 5 Ch 1-20 Review
FINAL EXAM: Thursday, December 11, 2:15-5:00pm		