

# University Physics I

PHYS 2513-P01 Summer I 2015

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**Office Hours:** MTWR 3:40-6:00

**Class Location:** Room 301 NSB  
**Class Meeting Days & Time:** MTWR 1:00-3:40 p.m.

**Catalog Description:** Credit 3 semester hours. Calculus-based course includes Science history, measurement systems, motion, Newton's laws, energy, momentum and impulse, center of mass and moment of inertia, rotational motion, torque, elastic modulus, fluids.

**Prerequisites:** Physics lab I and differential calculus.

**Co-Requisite:** MATH 2014 and PHYS 2511.

**Text:** Wolfgang Bauer, "University Physics with Modern Physics," 1<sup>st</sup> Edition, McGraw Hill Pub.

**Access to Learning Resources:** PVAMU Library:  
 Phone: 936-261-1500  
 Web: <http://www.tamu.edu/pvamu/library/>  
 University Bookstore:  
 Phone: 936-261-1990  
 Web: <https://www.bkstr.com/Home/10001-10734-1?demoKey=d>

**Course Goal or Overview:**

The purpose of this course is to give the student an exposure to measurement systems, calculus-based motion, forces, energy, momentum, rotational motion, torque, elastic modulus and fluids in which he, or she, will be challenged and evaluated for understanding.

**Course Outcomes:**

Upon completing this course the student will have knowledge of many concepts in physics I, an enhanced applied knowledge of calculus, trigonometry, algebra, vector operations to include vector addition, dot product, cross product, simultaneous equation solutions, experience in solving many word problems in math and physics associated with standard concepts including measurement conversions, 2D and 3D events, Newton's laws, energy approach, momentum, center of mass, moment of inertia, rotational motion, torque, elastic modulus, fluid dynamics, enhanced understanding of how things work in static and dynamic mechanical systems, and the like.

**At the end of this course, the student will...**

		Core Curriculum Objective
1	Students will demonstrate knowledge of calculus and solve problems involving differential equations, integral equations and abstract manipulation of variables used to describes the laws of mechanics and motion	Critical Thinking & Empirical/Quantitative skills
2	Students will develop proficiency in the calculus methods of basic differential operations, derivatives, integral equations and the application of such methods to solving physics problems	Critical Thinking & Empirical/Quantitative Skills

3	Students will understand and demonstrate knowledge of calculus-based physics by utilizing writing and speaking tools through invention, organization, drafting, correcting and presentation of acquired knowledge	Communication and Personal Responsibility
4	Students will demonstrate knowledge by understanding the importance of specifying audience and purpose through the selection of appropriate communication tools	Empirical/Quantitative skills and Communication
5	Students will demonstrate knowledge and solve problems dealing with laws of motion and calculus-based techniques using complex interpretation of data and theories	Empirical/Quantitative skills and Communication
6	Students will demonstrate their mastery of physics notions through collecting and analyzing data, computer simulations, class-room discussions and participating effectively in groups with emphasis on reflective thinking.	Teamwork and Communication

### Course Policies:

This course uses a lecture/workshop(practice field of the mind) format. Reading and homework assignments will be made, and some problems will be graded. Frequent quizzes (expected everyday) will check for concept understanding immediately following concept introduction with examples in class. It is expected that you will need to spend at least two hours studying outside the class for each hour spent in class.

### Course Requirements & Evaluation Methods

1. Your grade will be based on class participation in the form of explaining problems, taking quizzes and before- and after- assessment tests (extra points to buffer your exam scores--you get paid for everything that you do), and three major exams (covering about five current chapters each).

2. Attendance should be maintained. Particularly, there is no way to make-up a quiz or lab missed, but if you miss a quiz, 1 point is taken.

3. Remember: 'To hear is to forget, to see is to know, to do is to understand'.

4. Your final grade will be based on your overall average falling in the following categories: A--from 90 to 100; B--from 75 to 89; C--from 60 to 74; D--from 40 to 59; F--under. In this course all three exams have values of 100 points each. The final grade is determined from the total points from the 100 point exams and post assessment exam with each correct answer valued at 0.5 point, plus all extra points from daily quizzes (up to about 3 points each), (other extra points are competitive on the first-hand-recognized basis, so one must study and practice to build self confidence to produce correct answers before your classmates do) impromptu questions (1 point each), working problems at the board (up to 2 points each), specific advanced homework problems (0.5 point each) on the following total point basis:

280—300 +	A
230—279	B
180—229	C
120—179	D
0—119	F

## 5 WEEK CALENDAR

Week	Topic	Note
1-2.5	FIRST 2.5 WEEKS  Discussion on what is physics, and why it is the backbone of our technological society. The historical need and development of the English Metric systems of measurement. A review of Algebra, trigonometry, differential and integral calculus, and scientific notation. Vector addition. Quantitative description of motion-- displacement, velocity, acceleration. Ideal equations of motion. Freely falling bodies. Projectile motion. EXAM #1. Circular Motion. Newton's Laws. Force equilibrium. Friction.	

	Centripetal force. Satellite principles. Newton's second law detailed. Newton's universal law of gravitation. Motion in 2 dimensions. Dot product and cross products. Energy--kinetic, potential, work. Conservative v.s. dissipative forces. Motion in a resistive medium. Power. EXAM #2.	
2.5-5	SECOND 2.5 WEEKS  Impulse and momentum. Conservation of momentum. Collisions--elastic and inelastic. Propulsion. Angular displacement, velocity and acceleration, momentum, kinetic energy. Center of gravity. Moment of inertia calculations. Torques (moments). Torque equilibrium and applications. Stress and strain, elasticity and plasticity. Elastic modulus. Simple harmonic motion. Coil Spring. Simple pendulum. Center of oscillation. Hydrostatics. Pressure in a fluid. Archimedes' principle. Forces against a dam. Hydrodynamics--continuity equation, Bernoulli's equation and applications. EXAM #3.	
		3 <sup>rd</sup> Exam
5	13. Review	Final Exam

## University Rules and Procedures

Disability statement (See Student Handbook):

Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of academic dishonesty:

1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.
2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.
3. Fabrication: use of invented information or falsified research.
4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else's words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

### Nonacademic misconduct (See Student Handbook)

The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):

Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

**Attendance Policy:**

Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of 'F'. Absences are accumulated beginning with the first day of class.

**Student Academic Appeals Process**

Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructors assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.