Course Syllabus
And
Instructor Plan

University Physics I
PHYS 2425

Dr. Sayed Ali Khan

This is a 16-week course

Designed for face-to-face

Course Description: PHYS 2425 University Physics I (Lecture)

This course is based on the fundamental principles of physics, using calculus, for science, computer science, and engineering majors; the principles and applications of classical mechanics, including linear mechanics, energy, rotational mechanics, oscillation/harmonic motion, physical systems, thermodynamics; and emphasis on problem solving.

Credits 4

Lecture Hours 3

Lab Hours 3

Lab Fee Course Fee

Field Experience Hours 0

Clinical Hours 0

Course Type: Academic-AGCM

Extended Hours 0

Practicum Hours 0

Contact Hours 96

Prerequisite:

MATH 2413 Calculus I (4 SCH version)

Corequisite:

PHYS 2425 University Physics Laboratory I (Lab)

Course Notes and Instructor Recommendations:

Students must have a reliable computer and internet connection. Students must be able to demonstrate basic computer literacy skills such as keyboarding, sending and receiving email, and using a web browser.

Instructor Information:

Instructor Name: Dr. Sayed Ali Khan

PC Email: sayed.khan@panola.edu

Office no: 903-693-2042

Office location: 2304

Office hours: Friday 8:00 AM-12:00 PM, also by appointment

Required Text & Materials:

(1) Physics for Scientist and Engineers with Modern Physics, 4th Edition by Douglas C. Giancoli.
(2) College Physics 2e by P. Peter Urone, and R. Hinrichs: Open Stax: https://openstax.org/details/books/college-physics-2e
(3) A "scientific" calculator: This means something that can handle exponents, trig functions, hyperbolic trig functions, and logarithms.

Unexpected circumstances may arise, but Panola College offers various resources to support students. If you need mental health services or are facing challenges with transportation, affording class materials and supplies, or accessing food regularly—issues that may impact your class performance—please visit panola.edu/resources.

Methods of Teaching and Learning:

Students will learn through lecture and reading, as well as through work on homework, labs, and exams. Additional methods may be used as opportunities present themselves.

Learning Outcomes

Upon successful completion of this course, students will:

1. Determine the components of linear motion (displacement, velocity, and acceleration), and especially motion under conditions of constant acceleration.
2. Solve problems involving forces and work.
3. Apply Newton's Laws to physical problems.
4. Identify the different types of energy.
5. Solve problems using principles of conservation of energy.
6. Define the principles of impulse, momentum, and collisions.
7. Use principles of impulse and momentum to solve problems.
8. Determine the location of the center of mass and center of rotation for rigid bodies in motion.
9. Discuss rotational kinematics and dynamics and the relationship between linear and rotational motion.

PHYS 2425 University Physics Laboratory I (Lab):

Basic laboratory experiments supporting theoretical principles presented in PHYS 2425 involving the principles and applications of classical mechanics, including harmonic motion and physical systems; experimental design, data collection and analysis, and preparation of laboratory reports with focus on scientific writing.

Corequisite:

PHYS 2425 University Physics I (Lecture)

Learning outcomes:

Upon successful completion of this course, students will:

1. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.

2. Conduct basic laboratory experiments involving classical mechanics.
3. Relate physical observations and measurements involving classical mechanics to theoretical principles.
4. Evaluate the accuracy of physical measurements and the potential sources of error in the measurements.
5. Design and simulate fundamental experiments involving principles of classical mechanics.
6. Identify appropriate sources of information for conducting laboratory experiments involving classical mechanics.
7. Development of skills like critical thinking, appropriate communication, team work, empirical and quantitative skills will be the focus of this course.

Class Attendance

Regular and punctual attendance of classes and laboratories is required of all students. When a student has been ill or absent from class for approved extracurricular activities, he or she should be allowed, as far as possible, to make up for the missed work. If a student has not actively participated by the census date, they will be dropped by the instructor for non-attendance. This policy applies to courses that are in-person, online, and hybrid.

When an instructor feels that a student has been absent to such a degree as to invalidate the learning experience, the instructor may recommend to the Vice President of Instruction that the student be withdrawn from the course. Instructors may seek to withdraw students for non-attendance after they have accumulated the following number of absences:

Fall or spring semesters:

3 or more class meeting times per week - 5

absences 2 class meeting times per week

- 3 absences

1 class meeting per week - 2 absences

The student is responsible for seeing that he or she has been officially withdrawn from a class. A student who stops attendance in a class without officially withdrawing from that class will be given a failing grade; consequently, the student must follow official withdrawal procedures in the Admissions/Records Office.

Please note: Health Science and Cosmetology courses may require more stringent attendance policies based on their accreditation agencies. Please see the addendum and/or program handbook for further information concerning attendance.

Pregnant/Parenting Policy

Panola College welcomes pregnant and parenting students as a part of the student body. This institution is committed to providing support and adaptations for a successful educational experience for pregnant and parenting students. Students experiencing a need for accommodations related to pregnancy or parenting will find a Pregnancy and Parenting Accommodations Request form in the Student Handbook or may request the form from the course instructor.

Course Content

This course will encompass the following material to be divided into three sections. The outcomes of both the section of lecture and laboratory will be covered. SLOs are covered throughout the entire semester.

Lecture	Laboratory
Chapter 1: Introduction, Measurement and estimation	Scientific Method, measurement, Length, mass, time
Chapter 2: Kinematics, motion in 1-D	Measurement of displacement, velocity, and acceleration due to gravity
Chapter 3: Kinematics, motion in 2-D and 3-D, vectors Chapter 4: Newton's Laws of Motion	Projectile motion, and vectors addition with force table, graphically, and analytically
Chapter 5: Friction, Circular Motion, Drag Forces	Co-efficient of static friction, co-efficient of kinetic friction, and simulation of these.
Chapter 6: Gravitation	Acceleration due to gravity and its dependence on various factors.
Chapter 7: Work and Energy	Work energy theorem
Chapter 8: Conservation of Energy Chapter 10: Rotational motion	Law of conservation of energy with pendulum, and object rolling from certain height
Chapter 9: Linear momentum	Collision, conservation of linear momentum, and energy
Chapter 11: Angular momentum Chapter 12: Static Equilibrium	Equilibrium, center of mass, and torque
Chapter 13: Fluids:	Behavior of fluids, and Archimedes Principle
Chapter 14: Oscillations	Simple pendulum, and mass attached to a spring
Chapter 17: Temperature, Thermal Expansion, and the Ideal Gas Law Chapter 18: Kinetic Theory of Gases Chapter 19: Heat and the First Law of Thermodynamics Chapter 20 – Second Law of Thermodynamics	TM thermal expansion, heat transfer, and molar specific heat of solids

Course Grading Information:

- Lab 25%
- Quiz 20%
- Homework assignment + Class work assignment 30
- Exam 25%

Lab: The "lab" material will consist of problems completed in class and lab reports to be written outside of class. The lab rubrics will be discussed in the first lab session.

Quiz: There will be quiz after three chapters. the chapters that make up each unit exam will be posted in your Canvas course. Unit exams will be given throughout the semester.

Homework: There will be two type of assignment the homework assignment which will be

numerical problems and conceptual questions related to each section to challenge you to gain a deeper understanding of the course material. Homework will be turned in and graded utilizing Mastering Physics. Also, there will classwork assignment which will be consider students response in class and the instructor will ask assess various activity such as asking for concept, discussion and solving of numerical problems.

Exam: There will be three exams in the whole semester which will allow only answer sheets, pen, and scientific calculator.

Letter Grades are as Follows:

A = 90 – 100

B = 80 – 89

C = 70 – 79

D = 60 – 69

F = bellow 60