SYLLABUS
PHYS 2425
University Physics I

Western Texas College

I. Basic Course Information
   A. Lecture—Fundamental principles of physics, using calculus, for science, computer science, and engineering majors; the principles and applications of classical mechanics, including harmonic motion, physical systems, and thermodynamics; and emphasis on problem solving.
   B. Lab—The required laboratory activities will reinforce the lecture material.
   C. Any required prerequisites: C or higher in Math 2413 or equivalent.
   D. Required grade for enrolling in the next course in this sequence: Need a C or higher in PHYS 2425 in order to take PHYS 2426.

II. Student Learning Outcomes
   A. Lecture
      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.
      10. Solve problems involving rotational and linear motion.
      11. Define equilibrium, including the different types of equilibrium.
      12. Discuss simple harmonic motion and its application to real-world problems.
      13. Solve problems involving the First and Second Laws of Thermodynamics.
   B. Lab
      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 fundamental experiments involving principles of classical mechanics.
6. Identify appropriate sources of information for conducting laboratory experiments involving classical mechanics.

III. Testing Requirements
- A. The midterm and final exam must be proctored by an approved organization. (Ask your instructor for more details.)
- B. Students are allowed to use their book, notes, and a calculator while testing.
- C. Students are NOT allowed to use cell phones or access the internet.

IV. Major Course Requirements
- A. There will be 4 major chapter exams.
- B. There will be 8 lab assignments. Students are not allowed to take the final exam until at least 5 unit lab write-ups are completed.
- C. There will be a midterm exam.
- D. There will be a comprehensive final exam.

V. Information on Books and Other Course Materials
- A. **Online access required for all classes** – MasteringPhysics contains *University Physics* (e-book) *with Master Access,* 14th edition, Young and Freeman ISBN 9780133978216. Additional textbook is optional. ISBN 9780321973610.
- B. **Lab kits will be required**: You will need to purchase an e-science Lab Kit.
  The Lab kit # is 2601. These are sold through the WTC bookstore.
- C. Calculators: Required
- D. **Mastering Physics Access Card**: This can be purchased as a stand-alone item or with the textbook. ISBN: 9780133978216 – Stand alone.

VI. Grading Breakdown - Please refer to the first day handout for specifics.

VII. Other Policies, Procedures and important dates. Please refer to the WTC Catalog for the following
- A. Campus Calendar
- B. Final exam schedule
- C. How to drop a class
- D. Withdrawal information
- E. Student Conduct/Academic Integrity
- F. Students with disabilities

VIII. Course Content

Chapter	Topic
Mechanics	
1	Units, Physical Quantities, and Vectors
2	Motion Along a Straight Line
3	Motion in Two or Three Dimensions

4	Newton’s Laws
5	Applying Newton’s Laws
6	Work and Kinetic-Energy
7	Potential Energy and Energy Conservation
8	Momentum, Impulse, and Collisions
9	Rotation of Rigid Bodies
10	Dynamics of Rotational Motion
11	Equilibrium and Elasticity
12	Fluid Mechanics
13	Gravitation
14	Periodic Motion
Waves and Acoustics	
15	Mechanical Waves
16	Sound and Hearing
Thermodynamics	
17	Temperature and Thermal Equilibrium
18	Thermal Properties of Matter
19	The First Law of Thermodynamics
20	The Second Law of Thermodynamics

Disclaimer: Schedule and content is subject to change at the instructor’s discretion.

Last Modified: October 30, 2018