

PHYS 2 Topics in Elementary Physics

Course Code: PHYS 2

Instructor: Roberto Vega

Home Institution: Southern Methodist University

Office Hours: TBA

Email: rvega@smu.edu

Credit: 4

Course Description:

This course will provide an introduction to Classical Mechanics, the precise description of motion and the causes of change of motion.

Prerequisite:

A recent one year course in high school algebra and one year of plane geometry or a college course in algebra (MATH 9).

Required Textbooks:

Fundamentals of Physics by David Halliday, Robert Resnick and Jearl Walker

Course Objectives:

1. Students will be able to develop quantitative models appropriate to problems in Physics.
2. Students will be able to assess the strengths and limitations of quantitative models and methods used in Physics.
3. Students will be able to apply symbolic systems of representation.
4. Students will be able to collect, organize and analyze data from a variety of sources. Students will be able to formulate structured and logical arguments.
5. Students will be able to test hypotheses and make recommendations or predictions based on results.
6. Students will be able to communicate and represent quantitative information or results numerically, symbolically, aurally, visually, verbally, or in writing.
7. Students will have a basic understanding of the laws of mechanics and Newton's law of gravitation.

Course Schedule:**Week 1:**

Class 0: Administrative Info

Class 1: Units and Dimensional Analysis (Chapter 1)

Class 2: Calculus Review

Class 3: One dimensional Kinematics (Chapter 2)

Class 4: One dimensional Kinematics (Chapter 2)

Class 5 & 6: Free Fall, Vectors (Chapters 2 & 3)

Class 7: Two-Dimensional Motion, Projectile Motion (Chapt. 4)

Class 8: Dot Products of Vectors

Lab 1: Free Fall Motion Analysis

Week 2:

Class 9: Uniform Circular Motion (Chapter 4)

Class 10: Newton's Laws (Chapter 5)

Class 11: Newton's Laws Applications (Chapter 6)

Class 12: Resistance and Resistive Forces (Chapter 6)

Class 13: Kinetic Energy and Work (chapter 7)

Class 14: KE-Theorem and Potential Energy (Chapter 7 & 8)

Class 15: Conservation of Energy (Chapter 8)

Lab 2: Circular and Projectile Motion Analysis

Week 3:

Class 16: Conservation of Energy II (Chapter 8)

Class 17: Momentum and Center of Mass (Chapter 9)

Class 18: Collisions (Chapter 9)

Class 19: Rotational Motion (Chapter 10)

Class 20: Rotational Motion II (Chapter 10 & 11)

Class 21: Cross Products, Rotational Motion III (Chapt. 10 & 11)

Class 22: Torque and Angular Momentum I (Chapter 11)

Class 23: Torque and Angular Momentum II (Chapter 11)

Week 4:

Class 24: Rolling Motion (Chapter 11)

Class 25: Equilibrium and Elasticity (Chapter 12)

Class 26: Newton's Law of Gravitation (Chapter 13)

Class 27: Newton's Law of Gravitation II (Chapter 13)

Class 28: Newton's Law of Gravitation II (Chapter 13)

Class 29: Oscillations (Chapter 15)

Class 30: Oscillations (chapter 15)

Lab 4: An Exploration of Dark Matter

Homework Problems:

Homework assignments from the textbook by Halliday, Resnick, and Walker.

Homework Set 1:

[Chapter 2:](#) Questions: 1, 3, 4, and 9. Problems: 5, 7, 15, 42, 49

[Chapter 3:](#) Problems: 3, 5, 8, 15

[Chapter 4:](#) Problems: 14, 28, 61, 64

Homework Set 2:

[Chapter 5:](#) Problems: 6, 24, 54, 63

[Chapter 6:](#) Problems: 12, 16, 23, 32

[Chapter 7:](#) Questions: 2, 5, 7. Problems: 20, 30, 32

Homework Set 3:

[Chapter 8:](#) Questions: 2, 4. Problems: 7, 19, 21

[Chapter 9:](#) Questions: 5, 8. Problems: 2, 13, 50,

[Chapter 10:](#) Problems: 9, 29, 40, 41

[Chapter 11:](#) Problems: 12, 49, 53

Homework Set 4:

[Chapter 12:](#) Problems: 3, 13, 17

[Chapter 13:](#) Questions: 3, 4, 10. Problems: 12, 13, 20, 47, 50,

[Chapter 15:](#) Questions: 2, 7. Problems: 21, 33, 41

Grading & Evaluation:

Course will be evaluated based on homework 25%, two midterm exams 50%, and one final exam

25%. Typically, the standard grade assignment will apply, i.e.

Letter Grade Assignment

Final grades assigned for this course will be based on the percentage of total points earned and are assigned as follows:

Letter Grade	Percentage	Performance
A	93-100%	Excellent Work
A-	90-92%	Nearly Excellent Work
B+	87-89%	Very Good Work
B	83-86%	Good Work
B-	80-82%	Mostly Good Work
C+	77-79%	Above Average Work
C	73-76%	Average Work
C-	70-72%	Mostly Average Work
D+	67-69%	Below Average Work
D	60-66%	Poor Work
F	0-59%	Failing Work

Course Policies

Attend Class

Students are expected to attend all class sessions as listed on the course calendar.

Build Rapport

If you find that you have any trouble keeping up with assignments or other aspects of the course, make sure you let your instructor know as early as possible. As you will find, building rapport and effective relationships are key to becoming an effective professional. Make sure that you are proactive in informing your instructor when difficulties arise during the semester so that they can help you find a solution.

Understand When You May Drop This Course

It is the student's responsibility to understand when they need to consider disenrolling from a course. Refer to the Course Schedule for dates and deadlines for registration. After this period, a serious and compelling reason is required to drop from the course. Serious and compelling reasons includes: (1) documented and significant change in work hours, leaving student unable to attend class, or (2) documented and severe physical/mental illness/injury to the student or student's family.

Commit to Integrity

As a student in this course (and at this university) you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this class and also integrity in your behavior in and out of the classroom.

Academic Honesty Policy & Procedures

“The principles of truth and honesty are recognized as fundamental to a community of scholars and teachers. University expects that both faculty and students will honor these principles, and in so doing, will protect the integrity of academic work and student grades.”

Definitions

“**Cheating** is the act of obtaining or attempting to obtain credit for academic work through the use of any dishonest, deceptive, or fraudulent means.”

“**Plagiarism** is a form of cheating.”

“Plagiarism is the use of distinctive ideas or works belonging to another person without providing adequate acknowledgement of that person’s contribution.”