

California State University, Sacramento

2021 Summer Program

PHY 101 Introduction to Physics with Lab

Course Outline

Course Code: PHY 101

Instructor: Roberto Vega

Home Institution: Southern Methodist University

Office Hours: by appointment

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Credit: 3

Course Description:

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

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.

Required Textbooks: *Fundamentals of Physics* by David Halliday, Robert Resnick and Jearl Walker

Grading & Evaluation:

Course will be evaluated based on homework 30%, one midterm exams 35%, and one final exam 35%.

Grade Grade Points

A	4.0
A-	3.7
B+	3.3
B	3.0
B-	2.7
C+	2.3
C	2.0
C-	1.7
D+	1.3
D	1.0
D-	0.7
F	0.0

Course Schedule: (Tentative)

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	<ul style="list-style-type: none">• Introduction• Units and Dimensional Analysis	1-d Kinematics: <ul style="list-style-type: none">• Speed• Velocity• Acceleration	Constant Acceleration: <ul style="list-style-type: none">• Free Fall	2-d Kinematics: <ul style="list-style-type: none">• Vectors• Projectile Motion	Lab: Free Fall Projectile Motion TA Session

<p>Week 2</p>	<p>2-d Kinematics:</p> <ul style="list-style-type: none"> • Circular Motion 	<p>Dynamics:</p> <ul style="list-style-type: none"> • Newton's Laws 	<ul style="list-style-type: none"> • Newton's Laws-Friction • Static Equilibrium 	<ul style="list-style-type: none"> • Centripetal forces • Work and Kinetic Energy 	<p>Exam 1</p> <p>Exam discussion</p> <p>TA Session</p>
<p>Week 3</p>	<ul style="list-style-type: none"> • Potential Energy • Conservation of Energy 	<ul style="list-style-type: none"> • Systems of Particles and Momentum 	<ul style="list-style-type: none"> • Rotational Kinematics 	<ul style="list-style-type: none"> • Rotational Dynamics 	<p>Lab:</p> <ul style="list-style-type: none"> • Friction <p>TA Session</p>
<p>Week 4</p>	<ul style="list-style-type: none"> • Oscillatory Motion, Waves, Resonance 	<ul style="list-style-type: none"> • The Law of Gravitation 	<ul style="list-style-type: none"> • Kepler's Laws 	<ul style="list-style-type: none"> • Review <p>TA Session</p>	<p>Final Exam</p>