



Beijing Jiaotong University

2021 Summer Session

PHY 101 Introduction to Physics with Lab

Course Outline

Term: June 14 - July 09, 2021

Class Hours: 16:00-17:50 (Monday through Friday)

Course Code: PHY 101

Instructor: Roberto Vega

Home Institution: Southern Methodist University

Office Hours: TBA and by appointment

Email: rvega@smu.edu

Credit: 4

Class Hours: This course will have 52 class hours, including 32 lecture hours, 8 professor office hours, 8 TA discussion session hours, and 4 review session hours.

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%. Typically, the standard grade assignment will apply.

Grading System (1 ~ 100)

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|---------------------|---------------------|
| A : 94 - 100 | A- : 90 - 93 |
| B : 83 - 89 | B- : 80 - 82 |
| C : 73 - 79 | C- : 70 - 72 |
| D : 63 - 69 | D- : 60 - 62 |
| F : Fail | |

Course schedule:

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
Week 2	2-d Kinematics: <ul style="list-style-type: none"> Circular Motion 	Dynamics: <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 	Exam 1 Exam discussion TA Session
Week 3	<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 	Lab: <ul style="list-style-type: none"> Friction TA Session
Week 4	<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 TA Session	Final Exam