National Taiwan University of Science and Technology

2020 Summer Program

PHY 101 Introduction to Physics with Lab

Course Outline

Term: July 06-August 07,2020

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: According to the regulations of Minister of Education, R.O.C, 18 class hours could be counted as 1 academic credit in all universities in Taiwan. This course will have 72 class hours, including 40 lecture hours, professor 10 office hours, 10-hour TA discussion sessions, 2-hour review sessions, 10 laboratory hours.

Course Description: This course will provide and 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 25%, two midterm exams 50%, and one final exam 25%. Typically, the standard grade assignment will apply, i.e. 95-100 A, 90-94 A-, 88-89.9 B+, 84-87.9 B, 80-83.9 B-, 78-79.9 C+, 74-77.9 C, 70-73.9 C-, 68-69.9 D+, 64-67.9 D, 60-63.9 D-, Below 60 F.

Course Schedule: (Tentative)

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Week 1	• Introduction • Units and Dimensional Analysis	**1-d Kinematics:** • Speed • Velocity • Acceleration	**Constant Acceleration:** • Free Fall	**Lab:** • Free Fall	TA Session
Week 2	**2-d Kinematics:** • Vectors • Projectile Motion	**2-d Kinematics:** • Circular Motion	**Dynamics:** • Newton's Laws	**Lab:** • Projectile Motion	TA Session
Week 3	**Exam 1** • Exam discussion	• Centripetal forces • Work and Kinetic Energy	• Potential Energy • Conservation of Energy	• Systems of Particles and Momentum	TA Session
Week 4	• Rotational Kinematics	• Rotational Dynamics	• Static Equilibrium	**Lab:** • Newton's Laws-Friction	**TA Session**
Week 5	• Oscillatory Motion	• The Law of Gravitation	• Kepler's Laws	**Lab:** • Gravitation and Dark Matter	**Exam 2** • Exam Discussion