한국외국어대학교
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Hankuk University of Foreign Studies

2024 Summer Session

PHY 101 Introduction to Physics with Lab

Course Outline

Course Code: PHY 101

Instructor: Roberto Vega

Home Institution: Southern Methodist University

Office Hours: Tuesdays 9-11 am

Email: rvega@mail.smu.edu

Lab TA's: TBA

Credit: 4

Class Hours:

This course will have 72 class hours, including 40 lecture hours, professor 10 office hours, 10-hour TA discussion sessions, 2-hour review sessions, 24 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. In particular students will learn Newton's Laws and how they govern motions of bodies in space.
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.
8. Students will learn Bernoulli’s Laws and aspect of Fluid motion.

Required Textbooks:

Fundamentals of Physics by David Halliday, Robert Resnick and Jearl Walker, 12th ed.

Grading & Evaluation:

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

Grading System (1 ~ 100)

A+ : 96 - 100	A : 91 - 95
B+ : 86 - 90	B : 81 - 85
C+ : 76 - 80	C : 71 - 75
D+ : 66 - 70	D : 60 - 65
F : 0 - 59	
Pa : Pass	Fa : Fail

Course Schedule:

PHY 101 Course Syllabus
SUMMER 2024 (Jun 3 - Jun 28)
Textbook: Halliday, Fundamentals of Physics**, 12e**

Lecture	Date	Lecture Topic	Text Reading	Helpful Links

1	6/3	Introduction	1.1-1.3	
2		Motion in One Dimension, Velocity	21.-2.2	1-D Kinematics
3	6/4	Motion in One Dim., Acceleration	2.3-2.4	Free Fall
4		Motion in One Dimension - Free Fall	2.5	
5	6/5	Vectors	3.1-3.3	Vector Algebra
6		Motion in Two-Dimensions	4.1-4.3	
7	6/6	Projectile Motion	4.4	Projectile Motion
8		Circular Motion	4.5	Circular Motion
9	6/7	Forces and Newton's Laws	5.1-5.2	
10		Newton's Laws Applications	5.3	**Homework set 1 due**
11	6/10	Newton's Laws Applications	5.3	
12		Resistance and Newton's Laws	6.1-6.2	
13	6/11	Drag Force	6.2	
14		Circular Motion and Force	6.3	
15	6/12	Work and Kinetic Energy	7.1-7.2	Scalar Product of Vectors
16		Work and Gravity	7.3	Roller Coasters
17	6/13	Work-Variable Forces-Springs	7.4	
18		Potential Energy, Total energy	8.1-8.2	
19	6/14	Work Energy Theorem	8.3-8.5	
20				
21	6/17	**Exam 1**	**Ch. 1-8**	**Homework set 2 due**
22		Center of Mass, Linear Momentum	9.1-9.3	
23	6/18	Collisions and Impulse	9.4	
24		Conservation of Linear Momentum	9.5	
25	6/19	Collisions	9.6-9.7	
26		Rotational Motion	10.1-10.3	
27	6/20	Rotational Inertia and KE	10.4-10.5	
28		Torque and 2nd Law	10.6-10.8	Vector Product of Vectors
29	6/21	Rotational and Translational Motion	11.1	

30		Conservation of Angular Momentum	11.5-11.9	
31	6/24	**Exam 2**	**Ch. 9-11**	**Homework Set 3 due**
32		Newton's Law of Gravitation	13.1-13.3	**Gravity**
33	6/25	Gravitational Potential Energy	13.4-13.5	
34		Keplers Laws	13.6-13.7	NASA-Kepler
35	6/26	Oscillations SHM	15.1-15.6	Hookes Law and Oscillation
36		Wave Motion	16.1-16.7	
37	6/27	Fluids	14.1-14.3	
38		Bernoulli's Laws	14.4-14.7	
39	6/28	**Final EXAM**	**Ch. 1-14**	
40				

Laboratory Schedule:

PHY 101 Laboratory Schedule
SUMMER 2024 (Jun 3 - Jun 28)
Textbook: Halliday, Fundamentals of Physics**, 12e**

Lab	Date	Lab Topic	Links and References
1	6/5	**Free Fall Motion Analysis**	Free Fall Lab
2	6/6	**Projectile Motion**	Go to Projectle Motion Lab.
3	6/12	**Friction and Air resistance**	Friction Simulation
4	6/14	**Energy Conservation**	Energy Conservation Simulation
5	6/18	**Collisions and Momentum**	Go to Collisions Lab
6	6/20	**Circular Motion and Rot. Dynamics**	Go to Rotational Motion Lab.
7	6/26	**An Exploration of Dark Matter**	Dark Matter Lab
8	6/27	**The Pendulum and SHM**	Go to Pendulum Lab

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

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