READING GUIDE FOR PHYS 107 – Classical Mechanics and Waves
FALL 03 Term

READING GUIDE TO THE TEXT

The purpose of this Reading Guide is to help Physics 107 students in using their textbook (*Physics* by Resnick, Halliday and Krane, 5th edition, extended version) in learning the material of the course. The Guide pertains to of all of the chapters and sections relevant for Physics 107, including the descriptive chapters at the end of the textbook which are intended for extra reading.

Each Section is graded according to the following code:

- **A** a very important section which should be studied carefully
- **B** an important section
- **C** a section which can be read quickly
- **D** a section which can be omitted and will not be covered in class
- **R** a section which is largely a review of Physics 12 and which will not necessarily be covered in class, but with which the student should be familiar

CHAPTER 1 – MEASUREMENT

- **R** 1.1-1.6 the first 6 sections are review
- **B** 1.7 Dimensional Analysis

CHAPTER 2 – MOTION IN ONE DIMENSION

This whole chapter is a review of high school physics and should be read carefully. It develops the important tools associated with the use of vectors, and most students will find they need more practice with the use of components of vectors and with multiplication laws for vectors. Part of the first assignment will be devoted to developing more skill with vectors.

- **R** 2.1 Kinematics with Vectors
- **R** 2.2 Properties of Vectors
- **B** 2.3 Position, Velocity and Acceleration Vectors
- **B** 2.4 One-Dimensional Kinematics
- **B** 2.5 Motion with Constant Acceleration
- **R** 2.6 Freely Falling Bodies

CHAPTER 3 – FORCE AND NEWTON'S LAWS

- **R** 3.1 Classical Mechanics
- **R** 3.2 Newton's First Law
- **R** 3.3 Force
- **R** 3.4 Mass
- **A** 3.5 Newton's Second Law
- **R** 3.6 Newton's Third Law
- **R** 3.7 Weight and Mass
- **B** 3.8 Applications of Newton's Laws in One Dimension

CHAPTER 13 – ENERGY 3: CONSERVATION OF ENERGY

B 13.1 Work Done on System by External Forces

B 13.2 Internal Energy in a System of Particles

B 13.3 Frictional Work

B 13.4 Conservation of Energy in a System of Particles

B 13.5 Center-of-Mass Energy

B 13.6 Reactions and Decays

C 13.7 Energy Transfer by Heat

CHAPTER 14 – GRAVITATION

C 14.1 Origin of the Law of Gravitation

B 14.2 Newton's Law of Universal Gravitation

C 14.3 The Gravitational Constant G

C 14.4 Gravitation Near the Earth's Surface

B 14.5 Two Shell Theorems

C 14.6 Gravitational Potential Energy

A 14.7 Motions of Planets and Satellites

C 14.8 The Gravitational Field

C 14.9 Modern Developments in Gravitation

CHAPTER 17 – OSCILLATIONS

B 17.1 Oscillating Systems

B 17.2 Simple Harmonic Oscillator

A 17.3 Simple Harmonic Motion

A 17.4 Energy in Simple Harmonic Motion

B 17.5 Applications of Simple Harmonic Motion

A 17.6 Simple Harmonic Motion and Uniform Circular Motion

B 17.7 Damped Harmonic Motion

B 17.8 Forced Oscillations and Resonance

D 17.9 Two-Body OScillations

CHAPTER 18 – WAVE MOTION

C 18.1 Mechanical Waves

C 18.2 Types of Waves

A 18.3 Traveling Waves

B 18.4 Wave Speed on a Stretched String

D 18.5 Wave Equation

C 18.6 Energy in Wave Motion

A 18.7 Principle of Superposition

A 18.8 Interference of Waves

A 18.9 Standing Waves

B 18.10 Standing Waves and Resonance

CHAPTER 19 – SOUND WAVES

C 19.1 Properties of Sound Waves

B 19.2 Traveling Sound Waves

C 19.3 Speed of SOund

B 19.4 Power and Intensity of Sound Waves

B 19.5 Interference of Sound Waves

A 19.6 Standing Longitudinal Waves

A 19.7 Vibrating Systems and Sources of Sound

CHAPTER 22 – MOLECULAR PROPERTIES OF GASES

D 22.1 Atomic Nature of Matter

D 22.2 Molecular View of Pressure

C 22.3 Mean Free Path

A 22.4 Distribution of Molecular Speeds

A 22.5 Distribution of Molecular Energies

D 22.6 Equations of State for Real Gases

D 22.7 Intermolecuilar Forces

CHAPTER 50 – NUCLEAR PHYSICS

C 50.1 Discovering the Nucleus

B 50.2 Some Nuclear Properties

A 50.3 Radioactive Decay

B 50.4 Alpha Decay

C 50.5 Beta Decay

C 50.6 Measuring Ionizing Radiation

C 50.7 Natural Radioactivity

C 50.8 Nuclear Reactions

D 50.9 Nuclear Models