Syllabus of PHYS 109 (452 Second term of 1445)

Textbook: College Physics, A strategic Approach.
Randall D. Knight, Brian Jones and Stuart Field, third edition, 2014, Pearson,
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This course is designed for students in Health Science to enable them to appreciate the basic concepts of physics which are relevant to their further studies.

Part I Force and Motion

Chapter 2 Motion in One Dimension

Chapter 3 Vectors and Motion in Two Dimensions

Chapter 4 Force and Motion

Chapter 5 Applying Newton's Laws

Chapter 8 Equilibrium and Elasticity

Part II Conservation Laws

Chapter 9 Impulse and Momentum

Chapter 10 Energy and Work

Part III Properties of Matter

Chapter 13 Fluids

Part V Optics

Chapter 18 Ray Optics

Part VI Electricity

Chapter 20 Electric Fields and Forces

Chapter 21 Electric Potential

Chapter 22 Current and Resistance

Part VII Modern Physics

Chapter 30 Nuclear Physics

Details of the selected chapters from the Textbook

Part I Force and Motion

Chapter 2 Motion in One Dimension

2.1 Describing Motion
2.2 Uniform Motion
2.3 Instantaneous Velocity
2.4 Acceleration
2.5 Motion with Constant Acceleration
2.6 Solving One-Dimensional Motion
2.7 Free Fall

Chapter 3 Vectors and Motion in Two Dimensions

3.1 Using Vectors
3.3 Coordinate Systems and Vector Components
3.4 Motion on a Ramp

Chapter 4 Force and Motion

4.1 Motion and Force
4.2 A Short Catalog of Forces
4.3 Identifying Forces
4.4 What Do Forces Do?
4.5 Newton's Second Law
4.6 Free-Body Diagrams
4.7 Newton's Third Law

Chapter 5 Applying Newton's Laws

5.1 Equilibrium
5.2 Dynamics and Newton's Second Law
5.3 Mass and Weight
5.4 Normal Forces
5.5 Friction
5.7 Interacting Objects
5.8 Ropes and Pulleys

Chapter 8 Equilibrium and Elasticity

8.1 Torque and Static Equilibrium
8.2 Stability and Balance

Part II Conservation Laws

Chapter 9 Impulse and Momentum

9.1 Impulse
9.2 Momentum and the Impulse-Momentum Theorem
9.3 Solving Impulse and Momentum Problems
9.4 Conservation of Momentum
9.5 Inelastic Collisions

Chapter 10 Energy and Work

10.1 The Basic Energy Model
10.2 Work
10.3 Kinetic Energy
10.4 Potential Energy
10.6 Using the Law of Conservation of Energy
10.7 Energy in Collisions
10.8 Power

Part III Properties of Matter

Chapter 13 Fluids

13.1 Fluids and Density
13.2 Pressure
13.3 Measuring and Using Pressure
13.5 Fluids in Motion
13.6 Fluid Dynamics

Part V Optics

Chapter 18 Ray Optics

18.2 Reflection
18.3 Refraction
18.5 Thin Lenses: Ray Tracing
18.7 The Thin-Lens Equation

Part VI Electricity

Chapter 20 Electric Fields and Forces

20.1 Charges and Forces
20.2 Charges, Atoms, and Molecules
20.3 Coulomb's Law
20.4 The Concept of the Electric Field
20.5 Applications of the Electric Field

Chapter 21 Electric Potential

21.1 Electric Potential Energy and the Electric Potential
21.7 Capacitance and Capacitors

Chapter 22 Current and Resistance

22.1 A Model of Current
22.2 Defining and Describing Current
22.5 Ohm's Law and Resistor Circuits

Part VII Modern Physics

Chapter 30 Nuclear Physics

30.1 Nuclear Structure
30.4 Radiation and Radioactivity
30.5 Nuclear Decay and Half-Lives