

Jacksonville State University
College of Arts and Sciences
Updated June 27, 2006

PHS 202 COLLEGE PHYSICS II

COURSE DESCRIPTION

This course is the second in a two-part series that introduces the basic principles of physics. This second semester begins with the study of electricity and basic circuits, followed by magnetism. A section on light including lenses and mirrors follows. The behavior of light waves such as rainbows and soap bubbles will also be explored. Finally, topics from quantum mechanics and special relativity are introduced to give students a flavor of the revolutionary nature of these topics in their original scientific setting. Graphical interpretation and real world applications are stressed whenever possible. Prerequisites: PHS 201 or equivalent.

TEXT

College Physics (6th ed.) by Serway and Faughn

COURSE OBJECTIVES

To learn the concepts of electricity, magnetism and light. Concepts of nuclear physics, special relativity and quantum mechanics will also be explored.

To learn the interrelationships between the concepts.

To learn the fundamental mathematical basis of science.

COURSE OUTLINE

Topic	Reading
Static Electricity	Ch. 15.1 – 15.2
Coulomb's Law	Ch. 15.3, Ch. 3.1 – 3.3
Electric Fields	Ch. 15.4 – 15.6, 15.8
Potential Difference	Ch. 16.1 – 16.5
Capacitance	Ch. 16.6 – 16.8
Energy and Capacitors	Ch. 16.8 – 16.10
Electric Current	Ch. 17.1 – 17.3
Resistance	Ch. 17.4 – 17.7
Electrical Energy	Ch. 17.7 – 17.9
Combinations of Resistors	Ch. 18.1 – 18.3
Kirchhoff's Rules	Ch. 18.4, 18.7 – 18.8
More Kirchhoff	
Magnets	Ch. 19.1 – 19.2
Magnetic Forces	Ch. 19.3 – 19.4
Exam 1	Ch. 15 – 18
Magnetic Forces	Ch. 19.6 – 19.7

Magnetic Fields Faraday's Law	Ch. 19.8 – 19.11 Ch. 20.1 – 20.2
Lenz's Law Transformers and ac Electromagnetic Waves	Ch. 20.3 – 20.4 Ch. 21.1, 21.7 Ch. 21.8, 21.11 – 21.12
Doppler Effect Light Dispersion	Ch. 14.6, 21.13 Ch. 22.1 – 22.5 Ch. 22.6 – 22.8
Mirrors Curved Mirrors Exam 2	Ch. 23.1 – 23.2 Ch. 23.2 Ch. 14.6, 19 – 21
Lenses Interference Double-Slit Interference	Ch. 23.4, 23.6 – 23.7 Ch. 24.1 – 24.2 Ch. 24.3 – 24.4
Thin Films Diffraction Polarization	Ch. 24.5 – 24.6 Ch. 24.7 – 24.8 Ch. 24.9, 29.1
Radioactivity Radioactive Decay Exam 3	Ch. 29.2 – 29.3 Ch. 29.4 – 29.7 Ch. 22 – 24
Photoelectric Effect X-rays Particle Waves	Ch. 27.1 – 27.3 Ch. 27.4 – 27.6 Ch. 27.7, 26.1 – 26.3
Relativity Comprehensive Final Exam	Ch. 26.5 – 26.6, 26.9

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PHS 212L ELEMENTARY LAB TECHNIQUES II

COURSE DESCRIPTION

Concepts of physics developed in the associated lecture courses will be studied through the use of hands-on activities. Students will work in groups to explore topics in electricity, magnetism, optics, and modern physics.

TEXT

Physics Lab Manual, by Dr. Laura Weinkauff

COURSE OBJECTIVES

To learn the methods of science and scientific inquiry.
To learn the mathematical and statistical basis of the concepts.
To learn real-world applications of the concepts.

COURSE OUTLINE

Charges and Electric Forces
Capacitors
Moving Charges
Resistance, Voltage and Current in Circuits
Kirchhoff's Laws
Magnets
e/m for the Electron: The Discovery of the Electron
Atomic Spectra
Lenses and Mirrors
Continue Lenses and Mirrors
Interference Patterns