f. Gravity near the earth's surface; geophysical applications
g. Satellites and "weightlessness"
h. Kepler's laws and Newton's synthesis

F. Work and Energy
a. Work done by a constant force
b. Work done by a varying force
c. Kinetic energy and the work-energy principle
d. Potential energy
e. Conservative and non-conservative forces
f. Mechanical energy and its conservation
g. Problem solving using conservation of mechanical energy
h. Other forms of energy; energy transformations and the law of conservation of energy
i. Energy conservation with dissipative forces: solving problems

G. Linear Momentum
a. Momentum and its relation to force
b. Conservation of momentum
c. Collisions and impulse
d. Conservation of energy and momentum in collisions
e. Elastic collisions in one dimension-solving problems using energy and momentum conservation
f. Elastic collisions in two or three dimensions
g. Inelastic collisions
h. Center of mass
i. Center of mass and translational motion

H. Rotational Motion
a. Angular quantities
b. Kinematic equations for uniformly accelerated rotational motion
c. Torque f gtiees and gtieif
d. Rotational dynamics; torque and rotational inertia
e. Rotational kinetic energy
f. Angular momentum and its conservation

I. Bodies in Equilibrium: Elasticity and Fracture
a. Statics-the study of force 291.55 Tm0 g 9(1)17(F)-8(r-8(2-8(.)34(a)38(4)48(5)58(3)34(.)14(.)3u)8(r

j. Viscosity
k. Flow in tubes: Poiseuille's equation, blood flow, Reynolds number
l. Object moving in a fluid; sedimentation and drag
m. Surface tension and capillarity
n. Pumps; the heart and blood pressure

K. Vibrations and Waves
a. Simple harmonic motion
b. Energy in the simple harmonic oscillator
c. Vertical spring derivations
d. The reference circle: the period and sinusoidal nature of SHM
e. The simple pendulum
f. Damped harmonic motion
g. Forced vibrations; resonance
h. Wave motion
i. Types of waves
j. Energy transported by waves
k. Reflection and interference of waves
l. Standing waves; resonance
m. Refraction and diffraction

L. Sound
a. Characteristics of sound
b. Intensity of sound
c. Intensity related to amplitude and pressure amplitude
d. The ear and its response; loudness
e. Sources of sound: vibrating strings and air columns
f. Quality of sound, and noise
g. Interference of sound waves; beats
h. Doppler effect
i. Shock waves and the sonic boom
j. Applications; ultrasound and medical imaging

M. Temperatures and Kinetic Theory
a. Atoms
b. Temperature
c. Thermal equilibrium and the zeroth law of thermodynamics
d. Thermal expansion
e. Thermal stresses
f. The gas laws and absolute temperature
g. The ideal gas law
h. Problem solving with the ideal gas law
i. Ideal gas law in terms of molecules: Avogadro's number
j. Kinetic theory and the molecular interpretation of temperature
k. Distribution of molecular speeds
l. Real gases and changes of phase
m. Vapor pressure and humidity
n. Diffusion

N. Heat
a. Heat as energy transfer
b. Distinction between temperature, heat, and internal energy
c. Internal energy of an ideal gas
d. Specific heat
e. Calorimetry-solving problems

- Daily reading assignments in the two texts listed above are required.
- Chapter problem assignments in "Physics" are required weekly.
- Written laboratory reports are required every week.

C. Other Assignments
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7. Required Materials

A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.

Book #1:

Author:	Walker, James
Title:	Physics