COURSE: PHYSICS 301: Introduction to Physics

DESCRIPTION: Presents fundamental principles of physics. Includes relevant topics in basic mathematics, mechanics, electricity, magnetism, electromagnetism, and modern physics. Lecture.

RECOMMENDED TEXT: Paul G. Hewitt, Conceptual Physics, 9th edition, earlier editions are fine. Note that the same author has a high school text with a similar title, so be careful to get the college text. (Any non-calculus college physics text should be fine, but Hewitt is probably the most readable, and most directly relevant to the exam.)

FORMAT: Exam consists of 25 multiple choice questions worth 2 points each and 5 problems requiring simple algebraic solutions worth 5 point each.

GRADING: Students must receive a "C" (73-76) in order to receive credit for a course taken as a Challenge Exam.

TOPICS FOR STUDY:

Newton's laws of motion.
Linear kinematics with constant acceleration.
Conservation laws, especially conservation of energy and momentum, and their application to simple mechanics problems such as collisions.
Newtonian and Einsteinian formulations of the principle of gravitation.
Principles of electricity and magnetism, including electrostatics and simple electrical circuits.
Mechanics of fluids, both incompressible and compressible (gases), including concepts of density, pressure, forces, and the ideal gas law.
Atomic theory of matter and kinetic nature of heat, including absolute zero and laws of thermodynamics.
Vibrations and waves, including interference and the Doppler effect.
Simple optics, including laws or reflection and refraction. Wave and particle nature of light.
Nuclear / sub-atomic physics, including structure of atoms, radiation and sub-atomic particles, radioactivity, and nuclear decay.