PHY 140Y - FOUNDATIONS OF PHYSICS
2001-2002
FALL TERM SYLLABUS

	TOPIC	TEXTBOOK CHAPTERS
I.	**Introduction** • units and dimensional analysis • scalars and vectors • differentiation and integration	**1, 3**
II.	**Classical Kinematics** • motion in a straight line • the acceleration of gravity • motion in more than one dimension • projectile motion • uniform and nonuniform circular motion • relative motion	**2, 3, 4**
III.	**Force and Energy in Classical Mechanics** • Newton's laws of motion • inertial vs. noninertial reference frames • forces - gravity, tension, normal forces • friction • work, energy, and power • conservation of energy • force and potential energy	**5, 6, 7, 8**
IV.	**Simple Harmonic Motion** • definition of simple harmonic motion • springs and pendulums • energy in simple harmonic motion • damped and driven harmonic motion, resonance	**15**
V.	**Special Relativity** • the special theory of relativity • implications of special relativity • time dilation, the twin paradox, Lorentz contraction • Lorentz transformations	**38**
If there is time…		
VI.	**Wave Motion** • wave types and wave properties • the wave equation • sound waves	**16, 17**

More detailed textbook page references for each section will be provided in class.

PHY 140Y - FOUNDATIONS OF PHYSICS
2001-2002
SPRING TERM SYLLABUS - TENTATIVE

TOPIC	TEXTBOOK CHAPTERS
• Gravitation	9.1 - 9.7
• Electrostatics, Coulomb's Law	23.1 - 23.5
• Gauss's Law	24.1 - 24.5
• Electrostatic Potential	25.1 - 25.3
• Rigid-body Rotation, torque and moment of inertia	12.1 - 12.5
• Angular momentum, 3D rotation and gyroscopes	13.1 - 13.6
• Black body radiation, photoelectric effect and the Bohr atom	39.1 - 39.4
• Matter waves and the uncertainty principle	39.5 - 39.7
• Quantum mechanics, particle in a square well, quantum oscillators and tunnelling	40.1 - 40.7
• Atomic physics	41.1 - 41.4
• Nuclear Physics	43.1 - 43.6
• Fission	44.1 - 44.3
• Quarks and Cosmology	45.1 - 45.5