University Physics 1 Schedule - Fall 2011 - Schneider

Week	Chapters/Topics	Topics	Suggested Chapter Problems
08/31-09/02	*Chapter 1* **: Intro / Measurement**	Units, Dimensions, Scientific Notation, Sig Figs	21, 31, 41, 45, 53, 55, 77
	Chapter 2: **Motion in One Dimension**	Displacement, Velocity, Speed, Acceleration, Graphs	1, 13, 15, 17, 25, 31, 49, 57, 85, 87, 99
09/05-09/09	*Chapter 2:* **Motion in One Dimension**	1D gravity vertical motion - Cop and Speeder problems	same
09/12-09/16	*Chapter 3:* **Motion in 2 and 3 Dimensions**	Vectors, simple projectile, advanced projectile, circular	7, 16 (d - explain why?), 23, 37 (assume launch =45 deg), 45, 56 [a) 0.8 m/s b) 1.79 m/s c) 30 deg upstream], 63, 77 (diff from #37 .. how?), 81, 87, 101, 103, 119
Thurs 09/15	**Test #1 (Chapters 1-3)**	* One dimensional motion - concepts * Speeder/cop type problems (different starting conditions) * River boat problems - across/up/down * Projectile - from cliff, or flat - different angles * Targeting problems with projectile motion (drop water balloons, throw to window, monkey in the tree ..) **Other test information :** Test will be between 4 and 6 problems (with sub-parts). A mixture of calculation, drawing, conceptual questions where appropriate. All calculations and answers are written on the test paper itself, no blue books needed. All work must be shown for full credit in the problem. One (1) 3"x5" card is allowed with anything you want to handwrite on it. (Save your cards for this and the other exams - you can use them on the final exam if you wish.)	
09/19-09/23	*Chapter 4:* **Newton's Laws**	1st law, inertia, force, mass, 2nd law, gravity, 3rd law, in nature, freebody, multiple objects	21, 27, 33*, 41, 45, 47, 59, 67, 71, 77
09/26-09/30	*Chapter 5:* **Applications of Newton's laws**	Friction (static, kinetic), Circular Motion (centripetal acceleration, centripetal force, banked curves)	33, 39, 43, 45, 57, 77, 85, 105, 107
	Chapter 6: **Work and Energy**	Work and Kinetic Energy (1D with constant forces, work-KE theorem, work w/ variable force)	Ch 6: 25, 51
10/03-10/07	*Chapter 6:* **Work and Energy**	Work and Energy in 3D (dot product)	
	Chapter 7: **Conservation of Energy**	Potential Energy (conservative forces, PE functions, nonconservative forces, PE and equil) Conservation of Energy (work/KE theorem, probs with kinetic friction, chemical energy)	39, 47, 65, 89, 93
10/10-10/14	*Chapter 7:* **Conservation of Energy**	probs with kinetic friction, chemical energy	same
Fri 10/14	**Test #2 (Chapters 4-7)**	# Newton's Laws (with and without friction) * inclined plane problems (w/friction) * circular tracks (friction) * multiple mass problems (w/friction) - inclines, hanging masses (mass range?) - one on top of the other, one in front of another # Work/Energy (conservation of energy) - general problems * Energy Chart (incorporates KE, PE, Wf and Etotal)	
10/17-10/21	*Chapter 8:* **Conservation of Momentum**	Center of mass (grav PE), CM by Integration (uniform stick, semicircular hoop), Motion of the CM, Conservation, KE, Collisions (impulse and average force, 1D collisions, 2D collisions), Center-of-Mass Reference Frame	41, 57, 59 (note: at max compress - velocities=same=what? - conserve E!), 93, 99, 101

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10/24-10/28	*Chapter 9:* **Rotation**	Ang Vel and Accel, Torque, Moment of Inertia, and Newton's Second Law for Rotation, calc Moment of Inertia (particles, continuous, parallel-axis), Rotational KE, Rolling Objects	19, 31, 41, 43 , 77
10/31-11/04	*Chapter 10:* **Conservation of Angular Momentum**	vector cross product, angular Momentum, Torque, Conservation	63 (work backwards - E at the "top", KE at bottom, momentum -> beginning), 73 (first, find C.M.!)
	Chapter 12: **Static Equilibrium**	Conditions for Equilibrium, examples: signs, ladders, diving boards, oh my!	15, 19 (consider the center of gravity to the be same as center of mass), 37, 57
11/07-11/11	*Chapter 11:* **Gravity**	Kepler's Laws, Newton's Law of Gravity, grav PE (escape speed, orbits)	33, 51, 53, 57 a+b only, 65, 91 (find speed to orbit the moon close to surface, then launch with that speed - how high?) 53, 55a, 79
11/14-11/18	*Chapter 13:* **Fluids**	Density, pressure, force on fluid, pressure under fluid, gauge pressure, barometer, Buoyancy and Archimedes' Principles, Fluids in motion: Bernoulli	31, 41, 55
Fri 11/18	**Test #3 (Chapters 8-12)**	*Completely elastic collisions (1D collisions, c.m. technique, spring compression between moving masses) *Inlastic collisions (1D or 2D collisions) *Rotational kinematics/dynamics (angular position, velocity, accel of rotating object {torque}, 2 masses + pulley problems *Static Equilibrium (diving board, hanging sign, ladder) *Angular Momentum (inelastic collisions: {"Joey pizzas", person on merrygoround} *Gravity (orbit velocities, launch to a height, velocity at some intermediate height)	
11/21-11/25	*Chapter 13:* **Fluids** **+ THANKSGIVING**	Density, pressure, force on fluid, pressure under fluid, gauge pressure, barometer, Buoyancy and	31, 41, 55
11/28-11/30	*Chapter 17 :* **Temperature and Kinetic Theory of Gases**	temperature scales, Thermometers, Ideal Gas Law, Kinetic Theory of Gases	41, 51, 71
12/05-12/09	*Chapter 18:* **Heat and 1st Law of Thermodynamics**	specific heat capacity/calorimetry, phase changes, latent heat, internal energy + work done by gas, First Law of Thermo, adiabatic vs isothermal, isothermal work, heat capacities (Cv and Cp) for ideal gas, adiabatic expansion, quasi-static adiabatic, adiabatic work	29, 39, 51, 57
12/12-12/16	*Chapter 19:* **2nd Law of Thermodynamics**	Heat Engines, second Law of Thermo, Combustion/Otto engine, efficiency, Fridges, COP, Carnot Engines, Entropy, entropy for constant pressure	27, 41, 67
	Chapter 20: **Thermal Properties and Processes**	thermal expansion, density of water, transfer of thermal energy, conduction, heat current, Radiation	29, 37, 43

Tues 12/20	**Final Exam - Tuesday Dec 20th - 10:30am-12:30pm - S321 ("Review" day on last day - more details in that last week)**

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