

Syllabus (1/28/2020): Phys 1005 – fall 2020

Instructor:	Prof. Kai Shum	Phone:	718-951-5000 Ext. 1227
Lec. Room:	3143N (sec. TEAB)	Time:	Tu/Th (11:00-11:50 am)
Reference Books:	1. <i>Physics Matters</i> by J. Trefil & R. Hazen, 2007 J. Wiley & Sons 2. Chapters by OpenStax College (Rice University) http://userhome.brooklyn.cuny.edu/kshum	Office Hours:	1:30 – 2:30 pm on Wed.
Department:	Physics	Office:	2156f-N
Lab. Assignment:	http://depthome.brooklyn.cuny.edu/physics/phylabs_new.html	Instructor's e-mail:	kshum@brooklyn.cuny.edu

Planned work:

Week of	Topics	Exp. #	Exp. Description	Problems & Exercises
1/28,30	Kinematics of 1D/2D motion (point-mass concept, coordinates, distance, displacement, speed/velocity, & inertial frames)	1	Intro: theory/verification ($L = \pi \cdot D$)	Assigned in class
2/4,6	Newton's 1 st law, two-object problems, acceleration, and de-accretion	2	Average speed: $v = \Delta x / \Delta t$	Assigned in class
2/11,13	Vertical motions with gravitational acceleration $a = \pm g$ ($g = 9.8 \text{ m/s}^2$)	3	$v^2 \sim \Delta x$	Assigned in class
2/18,20	2D projectile motions	4	Range = $v_{0x} \times \Delta t$	Assigned in class
2/25,26	Dynamics of motion: Newton's 2 nd ($\mathbf{F}_{\text{net}} = m\mathbf{a}$), 3 rd law (action/reaction forces), and system/sub-systems	5	Newton's 2nd law	Assigned in class
3/3,5	Energetics of motion: work done by a force, kinetic energy, gravitational potential energy, energy conservation; Review	6	Kinetic and potential energy	
3/10,12	Exam#1 (3/10) , Solutions of Exam#1	7	Simple pendulum	Assigned in class
3/17,19	Gravitational force/normal force/friction force/tension, Action/reaction force, concepts of systems/sub-systems	8	Heat & temperature ($Q = m c \Delta T$; $Q = R_h \Delta t$)	Assigned in class
3/24,25	Thermodynamics (1 st law, heat, heat-capacity, temperature)	9	Latent-heat of evaporation ($Q = L_v \Delta m$)	Assigned in class
3/31-4/2	Thermodynamics (2 nd law, latent-heat of evaporation/fusion), Ray-optics (mirrors)	10	Imaging by a flat mirror ($\Theta = \Theta'$)	Assigned in class
4/8-4/16	Spring recess			
4/21,23	Exam#2 (4/21) Solutions of exam#2, Ray-optics,	11	Index of refraction	Assigned in class
4/28,30	Electric current/power, ohm's law	12	Ohm's law ($V = IR$); $P=IV$	Assigned in class
5/5,7	Light-bulbs/Resistors in series and in parallel, nuclear physics	13	Radioactivity	Assigned in class
5/12,14	Ray-optics (spherical mirror imaging)	14	Lab exam (or spherical mirror imaging)	Assigned in class
5/15-	Reading day (no lectures)/final-exam			
	Grades: lecture-exams (2) 40%, lab. 28%, and final 32%			