Course Outline

Course title: Physics - I
Summer Semester 2015
Department of Mathematics and Physics
Bashundhara, Dhaka - 1229

Instructor	:	Abu M Khan
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Course No.	:	PHY 107
Section No.	:	01
Credit Hours	:	03 (Three)
Class Meeting Time	:	Sundays and Tuesdays 9:40am - 11:10am
Class Meeting Place	:	NAC 202
Consultation Time	:	2:30pm - 4:00pm everyday except Thursday or by appointment.
Course webpage	:	**http://abukhan.weebly.com/phy107-s1.html** Visit this page frequently. Any announcement and the quiz/exam solutions will be posted here.
Course description	:	This is designed to introduce the principles of newtonian mechanics at the freshmen level of the undergraduate study for engineering majors or equivalent. The key concepts to be developed throughout the semester are: vectors, equations of motions, Newton's laws, conservation laws of energy, momentum, the Work-Energy theorem, extension of linear motion into rotational motion including the conservation laws, gravitation, waves and oscillations.
Learning outcome	:	After the completion of the course, the students will be able to • analyze and setup a physical problem mathematically correct, like vector equations. • understand and apply the fundamental conservation laws in mechanics to solve various problems, such as conservation law of total energy. • apply vector calculus to solve problems in two or three dimensions • combine different simple concepts to solve an apparently complicated problem
Required Textbook	:	Fundamentals of Physics. Author: Halliday, Resnick & Walker (9^{th} edition). Call # QC21.3.H35. Any edition is sufficient. However the topics may have different section numbers depending on the edition.
Grade Distribution	:	The final grade is based on the attendance, quiz, two midterms and the final exam contributing 5%, 15%, 40% and 40% respectively. **Each class attendance is worth 0.25 marks. So attending 20 classes is equivalent to 5 marks which is the maximum a student can have.**
Attendances policy	:	Arriving 15 minutes late or more is automatic absent.
Rules and Regulations	:	There will be no make-up for any mid-term exams No make-up for any missed quizzes. The cell phone must be turned off during class times and in any exams.

Dishonesty policy	:	During quizzes, mid-terms and final exam each student must work alone. Any kind of unauthorized contribution(s) will be treated as cheating and will be given a zero. **Each student must bring his/her own calculator in quizzes and exams**.
Lecture Details	:	The tentative course/lecture schedule is given below. Note that these may be changed if necessary. There will be **ten** quizzes and the best **eight** will be counted.

Date	:	Topics
Lecture - 1 (19/05/2015)	:	Introduction. Measurement, units, dimensions, base units.
Lecture - 2 (24/05/2015)	:	Vectors: Scalars and vector quantities, vector addition rules using components and geometrical methods, Vector product rules.
Lecture - 3 (26/05/2015)	:	Motion in one dimension. Displacement, Speed, Velocity and accelerations; average and instantaneous vector quantities. **Quiz-1**.
Lecture - 4 (31/05/2015)	:	Free fall. Motion in Two and Three dimensions.
Lecture - 5 (02/06/2015)	:	Position, Displacement and acceleration vectors, average and instantaneous quantities. Projectile motion. **Quiz-2**.
Lecture - 6 (07/06/2015)	:	Newtons laws of motion. Force and mass. Types of forces. 1^{st} and 2^{nd} laws. Free body diagrams.
Lecture - 7 (09/06/2015)	:	3^{rd}law, frictional forces. **Quiz-3**.
Lecture - 8 (14/06/2015)	:	**Mid-Term Exam - I**.
Lecture - 9 (16/06/2015)	:	Work and Energy. Work done by a force, Work-Energy Theorem. Work done by gravitational and spring forces, Power.
Lecture - 10 (21/06/2015)	:	Potential energy and the conservation law of energy. Conservative forces and the path independence of work done, potential curve. **Quiz-4**.
Lecture - 11 (23/06/2015)	:	Conservation law of energy with and without frictional work. Linear Momentum. 2nd law revisited, conservation law of momentum, Impulse.
Lecture - 12 (28/06/2015)	:	Center of mass and the center of gravity. One and two dimensional collisions, types of collisions. **Quiz-5**.
Lecture - 13 (30/06/2015)	:	Rotation. Rotational equation of motion. Relation between linear and angular or rotational variables, moment of inertia, kinetic energy of rotation.
Lecture - 14 (05/07/2015)	:	Torques, angular momentum, conservation laws. **Quiz-6**.
Lecture - 15 (07/07/2015)	:	Parallel axis theorem.
Lecture - 16 (12/07/2015)	:	Static equilibrium. **Quiz-7**.
Lecture - 17 (14/07/2015)	:	**Mid-Term Exam - II**.
Lecture - 18 (21/07/2015)	:	Newtons law of Gravitation, superposition principle, acceleration near earth surface and at an altitude.
Lecture - 19 (26/07/2015)	:	Gravitational Potential energy, Keplers laws of gravitational motion, orbits and satellites. **Quiz-8**.
Lecture - 20 (28/07/2015)	:	Elastic systems. Spring and the SHM, Uniform circular motion.
Lecture - 21 (02/08/2015)	:	Position, velocity and acceleration of mass-spring system. Energy of a SHM. **Quiz-9**.
Lecture - 22 (04/08/2015)	:	Wave equation. Standing and travelling waves.
Lecture - 23 (09/08/2015)	:	Transverse and longitudinal waves. Damped and forced oscillation. **Quiz-10**.
Lecture - 24 (11/08/2015)	:	Interference of waves, sound waves, beats.
Final Exam	:	*Date, time and Venue are to be announced later.*