



HANYANG UNIVERSITY

2019 HISS Syllabus General Physics 1

Professor: Jin-Ho Cho
E-mail: jinhocho@hanyang.ac.kr
Home Univ.: Hanyang university
Dept.: Physics department

Description: This course is for the undergraduate students majoring in science- and engineering-fields. The course helps students to understand the basic concepts on mechanics, gravitation, periodic motion and waves. It also makes them adept in solving the relevant problems. In each week the course is composed of four sets of 3-hour lectures. Throughout the lectures, the students will learn how to understand various phenomena concerning forces and motions based on some fundamental principles and physical laws. The students can broaden their understanding of basic physical concepts by solving homework problems.

Objective: The course aims at promoting students to enhance their ability of understanding, thinking, and expressing via physics contents.

Preparations: John W. Jewett, Jr. and Raymond A. Serway, *Principle of Physics: a calculus based text*, (5th edition.) Thomson

Schedule: Week 1 Intro. And Vectors/ Motion in One-dimensions /Motion in Two Dimensions:
vector, vector addition, position & displacement, velocity & acceleration, projectile motion, circular motion, relative

	motion
Week 2	The Laws of Motion: force, Newton's law, inertial frame, weight, normal force, ramp, pulley
Week 3	More Applications of Newton's Law: friction, angle, vector product, centripetal force
Week 4	Energy and Energy Transfer: scalar product, work, kinetic energy, work-kinetic energy theorem, work due to conservative forces, power
Week 5	Potential Energy: the isolated system, work due to conservative forces, potential energy, energy conservation, potential energy function, work due to external sources
Week 6	Momentum and Collisions (I): linear momentum, impulse, linear momentum and kinetic energy in a collision, elastic collision
Week 7	Momentum and Collisions (II): elastic collision in one dimension, system of particles, center of mass, conservation of linear momentum
Week 8	Mid Term Exam
Week 9	Rotational Motion (I): vector product, small angle as a vector, angular variables, rotational kinetic energy, moment of inertia, parallel axis theorem, work due to torque
Week 10	Rotational Motion (II): rolling motion, kinetic energy in a rolling motion, rolling on a slope, angular momentum, rotation of a system of particles
Week 11	Gravity, Planetary Orbits (I): the law of gravitation, superposition principle,

	gravitational acceleration, gravity inside a mass shell, gravitational potential energy
Week 12	Gravity, Planetary Orbits (II): Kepler's laws of planetary motion, orbit & energy
Week 13	Oscillatory Motion: displacement in a harmonic motion, equation of motion, energy, torsion pendulum, simple harmonic oscillator, rotational motion, damped oscillation, driven oscillation
Week 14	Mechanical Waves/ Superposition and Standing Waves: wave length, frequency, propagating speed, superposition of waves, interference, standing wave, resonance, sound wave, intensity of sound & decibel, musical instruments, beats, Doppler effect
Week 15	Final exam

Evaluation:	Midterm (%)	Final (%)	Attendance (%)	Assignments (%)	Participation (%)	Etc. (%)
	40%	40%	10%	10%	00	00