



Typical Topics in Introductory College Physics I & II

Introductory college physics courses are often split into two semesters: **Physics I** (mechanics, waves) and **Physics II** (electricity, magnetism, optics, and modern physics). Each is offered in **Algebra-based** and **Calculus-based** formats. Below is a comparison of key topics for each course.

Course	Topic	Algebra-Based Focus	Calculus-Based Focus
Physics I	Kinematics	1D/2D motion with algebra & trig.	Vector calculus for motion.
	Newton's Laws	Forces, circular motion.	Rigorous derivations, continuous systems.
	Work & Energy	Work-energy theorem, conservation.	Integrals for variable forces.
	Momentum	Linear/angular momentum, collisions	Calculus in momentum flux.
	Rotational Motion	Torque, rotational kinematics.	Moment of inertia integrals.
	Oscillations & Waves	Simple harmonic motion, sound.	Differential equation solutions.
Physics II	Fluids & Thermodynamics	Fluids, heat, first/second laws.	Calculus-based derivations, pV work.
	Electricity & Magnetism	Coulomb's law, circuits, magnetism	Basics. Field integrals, Maxwell's equations.
	Optics	Reflection, refraction, lenses.	Wave optics with calculus.
	Modern Physics	Intro to relativity, quantum ideas.	More mathematical treatment.