

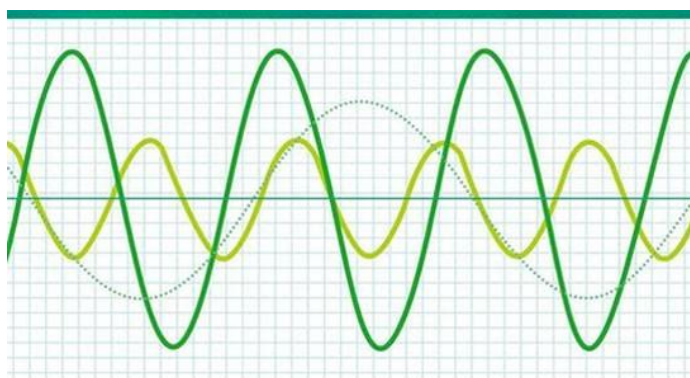
# Course Outline: PHY 111: Physics I/Basic Physics

Summer 2022

Text: Physics Vol. 1, Halliday, Resnick & Krane

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## Course Objectives:

This course will make you familiar with wave motion and the properties of waves. You'll get acquainted with Oscillation, oscillating systems, Simple Harmonic Motion, and related problems.

We shall present the idea of Heat and Thermodynamics, heat capacity, thermodynamic processes, and laws of thermodynamics. You'll be introduced to the second law, entropy, Carnot engine, its efficiency, and related problems.

## Learning Outcome

1. After completing the course students will be able to describe wave motion and properties of wave
2. Students will describe simple harmonic motion, derive differential equations for SHM, and solve the equation and related problems.
3. Students will be able to describe thermodynamic systems, heat capacity, thermodynamic processes, and laws of thermodynamics. They will be able to apply the first law to different systems.

5. Students will be able to derive the second law of thermodynamics, can solve related problems, and apply the law for different types of heat engines, and entropy. Carnot engine, the efficiency of Carnot engine and related problem

### **Course Summary:**

**Wave motion**, frequency, amplitude, wavelength, and phase. Mechanical waves, types of waves, the concept of the wavefront, travelling waves, sinusoidal waves, velocity, phase, and phase constant, and transverse and longitudinal waves.

**Oscillation**, oscillating system, Simple Harmonic Motion (SHM), differential equations describing SHM. The solution of the equation of SHM, time period, and angular frequency. The energy in SHM, application of SHM, simple pendulum. Equation of damped harmonic motion forced oscillation and resonance.

**Concepts of Thermodynamics**, heat, specific heat, adiabatic, isothermal, isobaric processes, zeroth law, first law, and the second law of thermodynamics, entropy. Carnot engine, the efficiency of Carnot engine, related problems.

### **Important:**

Plagiarism is presenting another person's work as one's own work, such as copying or reproducing it without acknowledgement or permission. Talking during exams or helping others write their own assignments are forbidden too. Plagiarism is **NOT** at all **ALLOWED** and will not be tolerated; if any case of plagiarism is found it will be strictly dealt with according to the policy of the university.

### **Assessment/Marking Scheme:**

Class participation and discussion	: 10
Assignment and Presentation	: 35
Mid Term (Test + Quiz)	: 15
Final Exam	: 40
TOTAL	: 100