

Review Topics

Physics of Music

Chapters 1-3

General topics

Book Chapters 1-3
Lectures
Homework problems assigned

Equations

$$f = \frac{1}{T} \text{ or } T = \frac{1}{f}$$

$$v = \frac{\lambda}{T} = \lambda f$$

$$f = \frac{1}{2L} \sqrt{\frac{F}{W}}$$

Chapter 1:

Periodic and simple harmonic motion, with examples
Application to sound
Frequency
Amplitude
Wave shape
Damped and Driven Oscillations
Resonance
Phase
Noise vs. musical sound
Combinations of SHM

Chapter 2:

- Transverse and Longitudinal waves, examples
- Speed of sound
- Representation of waves
- Wave Properties:
 - Huygens's principle
 - Superposition
 - Inverse square law
 - Polarization
 - Reflection
 - Refraction
 - Interference
 - Diffraction
- Addition of waves
- Beats
- Doppler effect
- Sonic boom
- Ultrasound and applications
- Infrasound and applications

Chapter 3:

- Transverse Standing Waves:
 - Description and graphical representation
- Overtone series
 - Origin and applications
- Mersenne's laws and applications
 - changing L , F or W
- Longitudinal standing waves
 - Description and graphical representation
 - Open tubes
 - Closed tubes
- Two-dimensional standing waves
 - Applications