

# Basics of Noise and Its Measurement

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# Introduction & Overview

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# Resources

- NPTEL courses
  - Video course on Acoustics
  - Web based course on Sound Propagation through Media
  - MOOC on Acoustics
- Virtual laboratory on Acoustics:  
<http://202.3.77.82/>
- Dhvani labs: <http://home.iitk.ac.in/~ntiwari/>

# Structure

- Online lectures
- Supplementary material
  - Presentations
- Assignments
  - Multiple choice questions
- Online interaction
  - Tutors and me
- Final examination

# Course Overview

- Introduction
- Terminology
- Wave equation
- Measurement of sound
- Instruments
  - Microphones and associated equipment
  - Impedance Tube

# Course Overview

- Mathematical methods for data analysis
  - FFT
  - Spectrogram
  - Short-term FFT
- Methods and techniques
  - Free-Field versus reverberant-field
  - Near-Field versus far field
  - Anechoic chamber
  - Weighting
  - Octave bands

# Course Overview

- Impedance
  - Measurement methods
- Noise absorption
  - Measurement methods
  - Methods to reduce sound
- Sound in public places
  - Reverb time
- Standards
- Some examples and closure

# References

- Acoustics, Beranek Leo L., Acoustical Society of America, 1993.
- Introduction to Acoustics, Finch Robert D., Pearson Prentice Hall, 2005.
- Fundamentals of Acoustics, Kinsler Lawrence E., et al, 4<sup>th</sup> ed., John Wiley & Sons, 2005.
- Sound and Structural Vibration, Fahy Frank, et al, 2<sup>nd</sup> ed., Academic Press 2007.