

# PH 207 (JAN) 1:2

## Electronics I

Department of Physics  
Indian Institute of Science  
Bangalore 560012

January 16, 2025

# Welcome!

- Welcome to all students!

## Class Hours

Tuesdays and Thursdays 15:30 to 17:00

3 hours per week

## Instructor

A. Mohanty

Department of Instrumentation and Applied Physics

Contact: [amohanty@iisc.ac.in](mailto:amohanty@iisc.ac.in)

# Target Audience

## Mandatory Registration

- Integrated PhD students of Physics

## Optional Registration

- Undergraduate students
- PhD students of non-electrical departments

## PH 207 (JAN) 1:2

### Electronics I

**Analogue electronics:** Basic diode and transistor circuits, operational amplifier and applications, active filters, voltage regulators, oscillators

**Digital electronics:** Logic gates, Boolean algebra, flip-flops, multiplexers, counters, displays, decoders, D/A, A/D. Introduction to microprocessors

#### Textbooks:

- Horowitz and Hill, The Art of Electronics, Second Edition
- Millman and Halkias, Integrated Electronics, McGraw-Hill

# About PH 207

- 1:2 implies 6 hours per week, but we only have 3 hours.
- Treating it like a 2:1 course is possible.
- Experiments are *not* specified.
- Introductory course on electronics

Electronic Device: A device that allows us to control the flow of electrons.  
What do we gain?

## Analogue Electronics

- Ability to amplify weak signals
- Amplifiers  $\Rightarrow$  oscillators, waveform generators

## Digital Electronics

- Logic, computation, information processing

# Objectives and Structure

## Objectives

- Provide basic training in electronics.
- Enable students to build electronic systems for their own research.

## Structure

- Lectures and demonstrations
- Laboratory sessions

## Documentation

- Maintain a record of all laboratory work.
- Experiments will begin after a few lecture/demonstration classes.

- Laboratory: Attendance, completion of experiments (35 %)
  - Requires the safety standards of an electronics laboratory
  - Proper shoes
- Theory: Written examinations (65 %)
  - One midterm, one final



# Topics for Revision

- Circuit Analysis
  - Transient Analysis
  - Phasor Analysis
- Passive Circuit Elements: R, C, L, M
- Laboratory Equipment

# Next Class

3:30 PM

21 January 2025, Tuesday

<http://iap.iisc.ac.in/~amohanty/ElectronicsOne/>