

# Basic Electrical Circuits (Online)

(Minor Degree)

Course Code: 20EEM1L2

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**Floated by: Swayam**

**Offered by: IIT Hyderabad**

**Instructor: Prof. Gajendranath Chowdary**

**Duration: 12 weeks**

**Prerequisites: XII std. level algebra and calculus, electrostatics**

## **COURSE LAYOUT:**

**Week 1:** Preliminaries; Current and voltage; Electrical elements and circuits; Kirchhoff's laws, Basic elements: Voltage and current sources, R, L, C, M; Linearity of elements

**Week 2:** Elements in series and parallel, Controlled sources

**Week 3:** Power and energy in electrical elements, Circuit Analysis Methods

**Week 4:** Nodal analysis, Extending nodal analysis with different sources

**Week 5:** Mesh analysis, Circuit theorems

**Week 6:** More circuit theorems, Two port parameters

**Week 7:** Two port parameters continued, Reciprocity in resistive networks

**Week 8:** Opamp and negative feedback, Opamps cont'd: Example circuits and additional topics

**Week 9:** First Order Circuits, First Order Circuits cont'd

**Week 10:** First order circuits with time-varying inputs, Sinusoidal steady state response and total response

**Week 11:** First order circuits with time-varying inputs, Sinusoidal steady state response and total response

**Week 12:** Direct calculation of steady state response from equivalent components, Magnitude and Phase plots; Maximum power transfer theorem

## **WEB LINK:**

[https://onlinecourses.nptel.ac.in/noc21\\_ee99/preview](https://onlinecourses.nptel.ac.in/noc21_ee99/preview)