

Basics of Electricity:

Electric charge
Electric fields
Conductors and insulators

Electrical Currents

Circuit Analysis Methods:

Node voltage analysis
Mesh current analysis
Superposition theorem

Electric Circuits

Components of a circuit
(batteries, resistors, capacitors)
Ohm's Law
Series and parallel circuits

Applications of Electric Currents:

Electric Motors
Transformers
Electronics and integrated circuits

Electrical Measurements

voltage measurement techniques
Current measurement techniques
Instrumentation and measurement tools

Direct Current (DC)

Definition and characteristics
Kirchhoff's laws
Dc circuit analysis techniques

Circuit Protection and Safety:

Fuses and circuit breakers
Grounding and electrical safety practices
Electrical codes and regulations

Power and Energy in Electrical Circuits:

Active, reactive and apparent power
Power factor
Energy calculations

Alternating Current:

Definition and characteristics
Sinusoidal waveforms
AC circuit analysis techniques