BASIC ELECTRICAL ENGINEERING SYLLABUS

Module 1: DC Circuits

- Basic Circuit Elements and Sources
- Ohm's Law
- Kirchhoff's Laws
- Series and Parallel Connection of Circuit Elements
- Source Transformation
- Node Voltage Analysis
- Mesh Current Analysis
- Maximum Power Transfer Theorem

Module 2: AC Circuits

- Alternating Voltages and Currents
- RMS, Average, Form Factor, Peak Factor
- Single Phase RL, RC, RLC Series and Parallel Circuits
- Power and Power Factor
- Balanced Three-Phase Systems

Module 3: Magnetic Circuits

- Electromagnetic Induction: Self and Mutual
- Magnetically Coupled Circuits
- Series and Parallel Magnetic Circuits
- Dot Convention

Module 4: Electrical Machines

- Principle of Operation, Construction, and Applications of:
    - DC Machines
    - Transformers
    - Induction Motors
    - Synchronous Generators
    - Stepper Motor
    - Brushless DC (BLDC) Motor

Module 5: Electrical Measurements

- Principle, Construction, and Operation of:
    - Moving Coil Instruments
    - Moving Iron Instruments
- Power and Energy Measurement in Single-Phase and Three-Phase Systems

Module 6: Electrical Supply Systems & Safety

- Concepts of Electrical Power Generation, Transmission, and Distribution Systems
- Wiring
- Electrical Safety
- Earthing
- Protective Devices