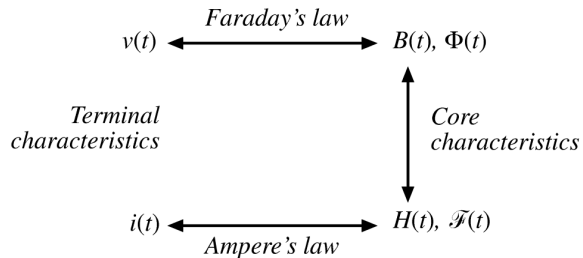


## Electric Machinery Fundamentals

- Overview of relative electromagnetic theories
  - Magnetic field: Ampere's law
  - Magnetic flux: magnetic material, hysteresis characteristics
  - Voltage: Faraday's law



- Magnetic circuit
  - Motor/generator: Induced voltage, induced force
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- Transformer
    - Ideal/non-ideal transformer
    - Equivalent transformer circuit
    - Voltage regulation, efficiency
- 
- Basic electric machine (motor/generator) theories
    - AC machine: winding structure
    - MMF (magnetomotive force)
    - EMF (electromotive force)
    - How the motor rotates?
      - Torque/speed
    - How the generator builds output voltage?
      - Voltage/current
- 
- Synchronous machine
    - Synchronous generator (SG) – the most widely used generator in the world
      - Structure and operation theories of SG
      - Equivalent circuit of SG
      - Voltage/current characteristics
      - Parallel operation
    - Synchronous motor
      - Operation principles
      - Starting of synchronous motor
      - Torque/speed characteristics
- 
- Induction (asynchronous) machine
    - Induction motor (IM) – the most widely used AC motor in the world
      - Structure and operation theories of IM

- Equivalent circuit of IM
  - Torque/speed characteristics
  - Basic motor control
- Induction generator
  - Output voltage control
  - Voltage/current characteristics
- DC machine
  - DC machines
    - Structure and operation theories of DC machines
    - Equivalent circuit of DC machines
    - Torque/speed characteristics
    - Basic motor control