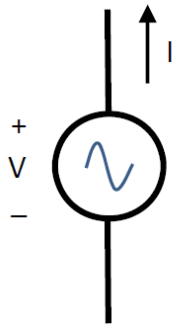
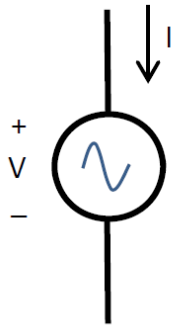
Stuff You Should Know

1. Current travels the path of least resistance
2. Current is present in a closed loop
3. Current cannot be measured in an open circuit
4. Voltage can be measured in an open circuit
5. Voltage cannot be measured across a short circuit
6. Power supplied equals power absorbed
7. Voltage in parallel is the same
8. Current and voltage can change instantaneously in a resistor
9. Series resistors add
10. Parallel resistors are combined using various techniques
11. Reduce a resistor network to a single resistor.
12. How to use
    a. Ohm's Law
    b. Voltage divider
    c. Current divider
    d. Kirchhoff's Current Law
    e. Kirchhoff's Current Law
    f. Loop equations
    g. Node equations



Source Convention
+P => Supplied
-P => Absorbed
+Q => Supplied
-Q => Absorbed



Load Convention
+P => Absorbed
-P => Supplied
+Q => Absorbed
-Q => Supplied

Stuff you should learn in this course:

13. Thevenin's Theorem (Norton):
    a. To get rid of a voltage source use a short circuit
    b. To get rid of a current source use an open circuit.
    c. For circuits with independent sources (round sources) find any two of these three; Voc, Isc, or Rth
    d. For circuit with both independent and dependent (diamond shape) sources find Voc and Isc and calculate Rth using Ohm's Law
14. Admittance Y is the inverse of Resistance
15. How and when to use Superposition
16. How and when to use Source Transformation
17. Capacitors store energy in an electric field
18. Capacitor is made up of two conductors separated by a dielectric insulator
19. Voltage cannot change instantaneously in a capacitor
20. Current can change instantaneously in a capacitor
21. A capacitor circuit will reach 99% of its final value after 5 time constants
22. A capacitor "looks like" an open circuit at steady state (after 5 time constants)
23. Can collapse a capacitor network the opposite of a resistor network
24. The capacitor time constant τ = Req*Ceq
25. A capacitor charges (discharges) 66% in one time constant.
26. Inductors store energy in an magnetic field
27. An inductor is a coil of insulated wire
28. Voltage can change instantaneously in a inductor
29. Current cannot change instantaneously in a inductor
30. A inductor circuit will reach 99% of its final value after 5 time constants
31. A inductor "looks like" a short circuit at steady state (after 5 time constants)
32. Can collapse a inductor network like a resistor network

33. The inductor time constant τ = Req/Leq
34. An inductor charges (discharges) 66% in one time constant.
35. For AC circuits capacitors and indictors are transformed into Ohm (siemens or admittance) values.
36. Impedance Z = R ± jX; where R is the resistance (real) value and the X value, +j is an inductor, -j is a capacitor, is the reactance (imaginary) value.
37. Admittance 1/Z = Y = G ± jB; where G is the conductance (real) value, and the B value, –j is an inductor and +j is a capacitor, is the susceptance value.
38. In AC circuits, once all impedance values are in ohms, ac circuits are evaluated exactly like DC circuits.
39. DC/AC circuit skills and how to use
    a. Ohm's Law
    b. Voltage divider
    c. Current divider
    d. Kirchhoff's Current Law
    e. Kirchhoff's Current Law
    f. Loop equations
    g. Node equations
    h. Thevenin's Theorem (Norton)
    i. Source Transformation
    j. Superposition
    k. Max Power Transfer
    l. How to calculate required values in a single phase system.
    m. How to calculate needed values in a three-phase system.