

Some important ideas from electronics I

Circuit Elements


Passive elements

Resistors $V = RI$

Capacitors $\frac{dV}{dt} = \frac{I}{C}$

Inductors $\frac{dI}{dt} = \frac{V}{L}$

Semiconductor Elements

Diodes \rightarrow 1-way valves
Transistors \rightarrow  Controllable
1-way valves
or Switches
amplification
OP amps

Types of power conversion

AC \rightarrow DC

AC \rightarrow AC

DC \rightarrow DC

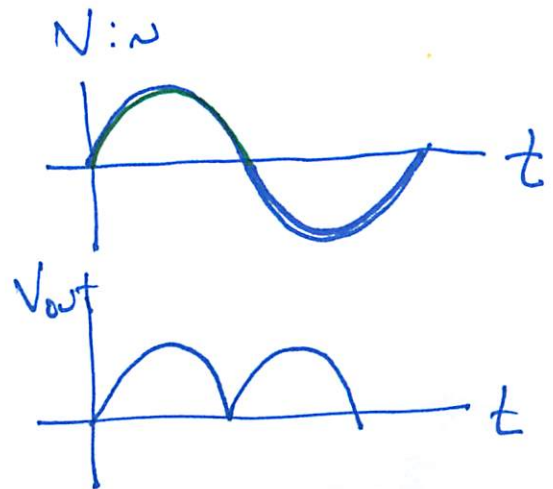
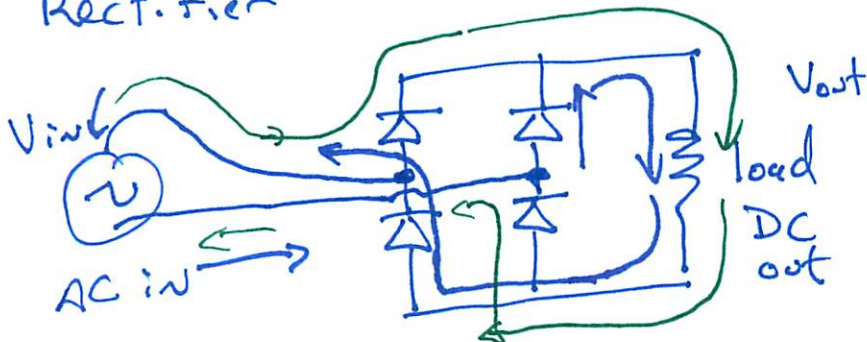
DC \rightarrow AC

Electronics lab example

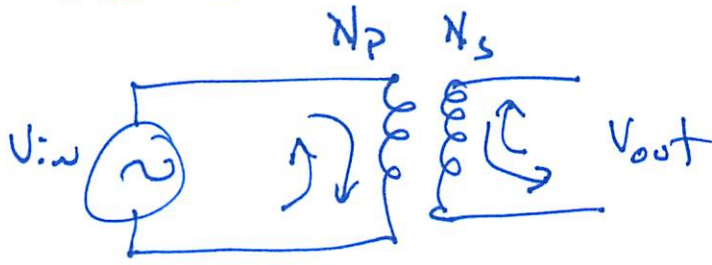
rectifier
transformer

voltage divider, pulsed motor control

Rectifier



transformer



$$V_{out} = \frac{N_s}{N_p} V_{in}$$

$N = \# \text{ of windings}$

Pulsed Motor

