

## ECE 35 Spring 09 Final review

Circuit Elements: Charge, current and voltage.

Power and Energy

The Passive Convention: definition of voltage polarity and current direction

Specification of power and energy – active or passive circuits, absorb or supply energy

Reference directions of ideal voltmeter and ammeter

Dependent and independent sources

Ideal and practical sources

Ohm's law, KVL, KCL

Node voltage, mesh current analysis

Circuit equivalent: resistor reduction, voltage and current division

Source transformation, superposition method

Thevenin and Norton equivalent circuits, maximum power transfer

Ideal op-amp

Different applications of ideal op-amp (analyze and recognize function of circuit)

Capacitors, Inductors; parallel/series capacitance/inductance reduction

First-order step response

Switched circuit initial condition analysis

Sinusoidal AC circuits

Phasor and frequency domain; graphical view of phasor diagram; KCL, KVL, node voltage and mesh current analysis

Frequency response and transfer function; low-pass, high-pass, band-pass filters

AC complex power, power factor and maximum power transfer

Labs: use of volt/ammeters, voltage divider, RC response, draw and analyze graphical view of AC signal in time domain, HP/LP filters.