Administrivia

- Midterm 1 stuff
  - People who didn't do so well: you can still get a good grade!
- HW #4 is up
- HW #3 regrade request deadline: Thursday, 07/24/03
- You can also refer to lectures #13, #14 and #15 from Spring 2003 for more stuff on diodes.

Last Time...

- Digital logic. Just understand:
  - What propogation delay is?
  - How to compute τ_{HL} and τ_{LH}

This Time...

- Diodes
  - What are they?
  - Non-ideal diode IV characteristics
  - Diode example 1
  - Method of load lines
  - A simple resistor example
  - Diode example 2
  - General method
- Diode models: first, second and third approximations.
- Diode examples 3 and 4.
- Practical diode circuits: half-wave rectifier and diode logic

Diodes: What are they?

- A handwavy definition: A “smart” switch - you will see why in lab later. Symbol:
- Allows current to flow in the direction of arrow only
- Many types of diodes exist - Regular (1N914), Zener, Schottky, Tunnel. We will concentrate only on 1N914
- NOTE: Diodes are nonlinear elements. We will see the reason in the next slide. If you want to understand nonlinearity, you can take a class like EECS 222 (Nonlinear system theory) @ UC Berkeley. SATUTORY WARNING: PROLONGED EXPOSURE TO EECS 222 MAY CAUSE DIZZINESS, BRAIN-ACHES AND OVERALL FEELING OF STUPIDITY.

Non-ideal diode IV graph

Diode Example 1

Load lines: A simple resistor circuit

Load lines: Diode example

Load lines: General method

- Thevenin + load lines

Large signal diode models

Diode example 3

Diode example 4

Practical diode circuits

In conclusion...

- Looked at diodes!
  - Load line method
  - First approximation.
  - Be smart about solving diode circuits! In fact, best method to attack nonlinearity: use your brain!
- For more information: look at Spring 2003 lectures 13 - 15, their homeworks, come to office hours!
- In lab this week: diodes and calbot...

Your calbot...

- Your first stop: http://inst.eecs.berkeley.edu/˜calbot/webpage/index.htm
- No contest, extra credit: ?????