Topics/info for Today:

- Web page:  http://www.ee.mtu.edu/faculty/bamork/ee5220/
- Book, references, syllabus, more are on web page.
- Software - Matlab. ATP/EMTP [ License - www.emtp.org ] ATP tutorials posted on our course web page
- EE5220-L@mtu.edu (participation = half letter grade, 5%)

- HW#4 will be posted. Partnered exercise. Due Wed Feb 10th.
- ATP Simulation pointers - numerical damping for Ls and Cs
- Cap Bank Switching (continued)
  - Insights on switching, discussion of homework probs.
  - Discussion - how to carry out HW#4
- Parameters
  - Sensitivity of response to precision of parameters.
  - Required complexity of system model depends on what's being simulated, frequency of response, etc.
  - Setup of this simple system simulation.
- time-step oscillation, or
- numerical instability
Numerical Oscillations -
(Trapezoidal Method in EMTP)

Typical: Very small L's
        Very large C's.

Solution: Place a numerical
           damping resistor
           a) In parallel w/ L
           b) In series w/ C

\[
\begin{align*}
R_{\text{Ramp}} & \quad \text{Ramp} \\
L_{\text{1}} & \quad \text{L1} \\
R_{\text{1}} & \quad \text{R1} \\
\end{align*}
\]

ATP Draw Implementation