ECE 3510 Exam 1 Study Guide First Exam will be on Thursday 2/1/07.

It will be a **closed book**, no calculator exam, but will include a information shown below.

The exam will cover

1. Laplace transforms (simple forms only)

Information you will be given

$$F(s) = \int_0^\infty f(t) \cdot e^{-s \cdot t} dt$$

Euler's equations (will not be needed)

- 2. Inverse Laplace transforms (partial fractions)
- Laplace Transform table class handout Laplace Transform properties from Lathi, p.389

- 3. Relationship of signals to pole locations
- 4. Boundedness and convergence of signals
- 5. H(s) of circuits
- 6. Block Diagrams & their transfer functions

Standard feedback loop transfer function



- 7. BIBO Stability
- 8. Impulse & step responses
- 9. Steady-state (DC gain) & transient step responses
- 10. Effects of pole locations on step response
- 11. Sinusoidal responses, effects of poles & zeros, etc.
- 12. Effect of initial conditions

$$Y(s) = \frac{b_2 \cdot s^2 + b_1 \cdot s + b_0}{s^2 + a_1 \cdot s + a_0} \cdot X(s) +$$

$$\frac{s \cdot y(0) + \frac{d}{dt}y(0) + a_{1} \cdot y(0) - b_{2} \cdot s \cdot x(0) - b_{2} \cdot s \cdot \frac{d}{dt}x(0) - b_{1} \cdot s \cdot y(0)}{s^{2} + a_{1} \cdot s + a_{0}}$$

- 13. Homeworks 2 7
- 14. Labs 1 & 2