Wednesday December 5, 2001

Math 2250-4
Review

Final exam Wed Dec 12
10:30-12:30 HERE

Review session
this Friday Dec 7
10:30-12:00 HERE

Exam is comprehensive:

15-20%	1.1-1.5	1st order DE's
	2.1-2.3	applications, equilibrium soltns
15-25%	3.1-3.6	matrix algebra and determinants
	4.1-4.5	vector space concepts
15-25%	5.1-5.6	linear DE's & spring applications
10-20%	6.1-6.2	eigenvalues & eigenvectors (applies heavily elsewhere)
15-25%	7.1-7.4	linear systems of DE's; tank & spring systems
15-20%	10.1-10.4	Laplace transforms; applications to DE's & DE systems

approximate percentages/topic

(integral & laplace tables from book covers will be provided)
(test is closed book/note; no graphing/linalg calculators allowed)

- Modeling: springs, spring systems; compartmental analysis (tanks) } most likely; population, velocity models chptr 2 } likely

Geometric meaning of solutions to DE's & systems of DE's
slope fields, equilibrium sols, stability
tangent vector fields (7.1)
existence, uniqueness

Analytic solution methods for DE's & systems

Guaranteed to be on final exam

- 1st order DE's linear, separable; higher order linear DE's: general form of soltn to inhomogeneous problem, how to solve x_H with constant coeff's, use of Euler's formula, applications to mass-spring problems
- eigenvalue, eigenvector methods to solve
$$\frac{d\vec{x}}{dt} = A\vec{x}$$
$$\frac{d^2\vec{x}}{dt^2} = A\vec{x} + (\cos\omega t)\vec{c}$$
- Laplace transforms to solve linear DE's & systems

Auxillary tools: Laplace trans (def & methods)
Linear algebra:
new vocabulary
solving linear systems, matrices, inverses, matrix alg., rref, dets
evals & evects
general form of soltn to $L(x) = b$ if L is a linear operator