McGill University MATH 263
Ordinary Differential Equations and Linear Algebra
Syllabus

(I) First Order Differential Equations

- introduction, definitions and geometrical interpretation
- linear equations
- separable equations
- exact equations and integrating factors

(II) Second and Higher Order Differential Equations

- linear homogenous equations, Wronskian
- review of complex numbers
- constant coefficient equations and Euler equations
- method of Undetermined coefficients
- variations of parameters
- reduction of order

(III) Laplace Transform

- definition and properties
- solution of initial value problems for constant coefficient equations
- step functions, discontinuous & periodic forcing, impulse functions
- convolutions

(IV) Linear Algebra & Linear Systems of Differential Equations

- review of systems of linear equations, row reduction, matrix operations
- vector spaces, linear transformations and their matrix representations, bases and dimension
- eigenvalues and eigenvectors, diagonalization of symmetric matrices
- linear systems of differential equations