Tentative Syllabus

Week 1
- Introduction: What is a differential equation?
- First order equations (linear case, separable equations, existence and uniqueness)
- Second order equations (linear homogeneous equations, reduction of order)

Week 2
- Second order equations (linear inhomogenous equations, variation of paramenters, mechanical vibrations)

Week 3
- Series Solutions (regular points, convergence, Euler equations and singular points)

Week 4
- Laplace transform (motivation, properties, discontinuous and impulse right-hand-sides, convolution)

Week 5
- Linear Systems (motivation, eigenvalues/eigenvectors, fundamental solution, solution representation)