Syllabus for Paul Dawkins Math 3301

This is the order of topics that I hope to follow this semester. Time sometimes gets away from me in this course so I may have to change up this list a little bit in terms of both topics covered as well as order in which they are covered. I will always try to warn you of any changes in the schedule before they happen.

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Basic Concepts Definitions Direction Fields

First Order Differential Equations

Linear Differential Equations Separable Differential Equations Exact Differential Equations** Bernoulli Equations** Substitutions** Intervals of Validity Modeling With 1st Order Differential Equations Equilibrium Solutions Euler's Method

Exam 1 – Tentative Date : September 21, 2018

Second Order Differential Equations

Basic Concepts Real, Distinct Roots Complex Roots Repeated Roots Reduction of Order Fundamental Sets of Solutions More on the Wronskian Nonhomogeneous Differential Equations Undetermined Coefficients Variation of Parameters Mechanical Vibrations

Exam 2 – Tentative Date : October 12, 2018

Laplace Transforms

The Definition Laplace Transforms Inverse Laplace Transforms Step Functions Solving IVP's with Laplace Transforms Nonconstant Coefficient IVP's* IVP's with Step Functions Dirac Delta Function Convolution Integral **Exam 3 – Tentative Date : November 9, 2018**

Systems of Differential Equations

Review : Systems of Equations Review : Matrices and Vectors Review : Eigenvalues and Eigenvectors Systems of Differential Equations Solutions to Systems Phase Planes Real, Distinct Eigenvalues Complex Eigenvalues Repeated Eigenvalues Nonhomogeneous Systems ** Laplace Transforms** Modeling

Exam 4 – Tentative Date : November 30, 2018

Series Solutions, Higher Order, Boundary Value Problems, Partial Differential Equations

These chapters are not covered in this course. They do present some interesting material however and I'd invite you to check them out.

* These sections are not on the syllabus and I cover them if I have the time.

** These sections are not on the syllabus and while I'd like to cover them never have the time.