Syllabus for Paul Dawkins Math 2414

This is the order of topics that I hope to follow this semester. Towards the end of the semester things tend to be a little rushed and I may deviate somewhat from the order listed here so that we can make sure and spend time on topics that may be more important than others.

Topic

Integration Techniques

- Integration by Parts
- Integrals Involving Trig Functions
- Trig Substitutions
- Partial Fractions
- Integrals Involving Roots
- Integrals Involving Quadratics*
- Using Integral Tables
- Integration Strategy
- Improper Integrals
- Comparison Test for Improper Integrals
- Approximating Definite Integrals

Exam 1 – Tentative Date : February 19, 2019

Applications of Integrals

- Arc Length
- Surface Area
- Center of Mass**
- Hydrostatic Pressure and Force**
- Probability*

Parametric Equations and Polar Coordinates

- Parametric Equations and Curves
- Tangents with Parametric Curves
- Area with Parametric Curves
- Arc Length with Parametric Curves
- Surface Area with Parametric Curves
- Polar Coordinates
- Tangents with Polar Coordinates
- Area with Polar Coordinates
- Arc Length with Polar Coordinates
- Arc Length and Surface Area – Revisited

Exam 2 – Tentative Date : March 21, 2019

Series and Sequences

Sequences
Series – The Basics
Series – Convergence/Divergence
Series – Special Series
Integral Test
Comparison/Limit Comparison Test
Alternating Series Test
Absolute Convergence
Ratio Test
Root Test
Strategy for Series
Estimating the Value of a Series**

Exam 3 – Tentative Date : April 11 2019

Power Series
Power Series and Functions
Taylor Series
Applications of Series
Binomial Series

Vectors

Vectors – The Basics
Vector Arithmetic
Dot Product
Cross Product

Three Dimensional Space

The 3-D Coordinate System
Equations of Lines
Equations of Planes
Quadric Surfaces
Functions of Several Variables***
Vector Functions***
Calculus with Vector Functions***
Tangent, Normal and Binormal Vectors***
Arc Length***
Curvature***
Velocity and Acceleration***
Cylindrical Coordinates
Spherical Coordinates

Exam 4 – Tentative Date : May 2, 2019

***** These sections are not on the syllabus and I rarely have the time to cover them
****** These sections are on the syllabus and but are only covered if I have the time.
******* These sections are taught in Calc III.