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 15, 2018

**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 9, 2018 – Note that this is the Friday before Spring Break! Do NOT schedule an early spring break!
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 5, 2018

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 : April 26, 2018

* 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.