Syllabus for Paul Dawkins Math 2415

This is the order of topics that I hope to follow this semester.

Topic

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

Partial Derivatives

- Limits
- Partial Derivatives
- Interpretations of Partial Derivatives
- Higher Order Derivatives
- Differentials
- Chain Rule
- Directional Derivatives

Applications of Partial Derivatives

- Tangent Planes and Linear Approximations
- Gradient Vector, Tangent Planes, Normal Lines
- Relative Minimums and Maximums
- Lagrange Multipliers

Exam 1 - Tentative Date : September 26, 2019

Multiple Integrals

- Double Integrals
- Iterated Integrals
- Double Integrals over General Regions
- Double Integrals in Polar Coordinates
- Triple Integrals

Triple Integrals with Cylindrical Coordinates
Triple Integrals with Spherical Coordinates
Change of Variables
Surface Area
Area and Volume – Revisited

Exam 2 - Tentative Date : October 24, 2019

Line Integrals

Vector Fields
Line Integrals – Part I
Line Integrals – Part II
Line Integrals of Vector Fields
Fundamental Theorem of Line Integrals
Conservative Vector Fields
Green's Theorem
Curl and Divergence

Surface Integrals

Parametric Surfaces
Surface Integrals
Surface Integrals of Vector Fields
Stokes' Theorem
Divergence Theorem

Exam 3 - Tentative Date : November 26, 2019

***** These sections are now taught in Calc II and I may or may not cover some of them in this class as a review.