

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 : September 17, 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 : October 8, 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 : November 5, 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 : November 26, 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.