Calculus 222 Syllabus

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Lectures should adhere (more or less) to the order given so as to simplify the task of the tutorial program. Weeks 3 and 9 are left open. Instructors should use these to devote more time to the topics they think deserve it or to catch up. Some topics are suggested. Consult the instructor’s guide for the treatment of series.

The following syllabus assumes 15 weeks of instruction.

TEXTBOOK: Calculus and Analytic Geometry by Thomas and Finney, 5th Ed.

Week 1

7-1,2,3 Basics of Integration, Substitution=(Chain rule)$^{-1}$, Trigonometric integrand

7-3,4 Integration of algebraic integrands by Trigonometric Substitution

Week 2

7-6 Partial Fractions

7-7 Integration by Parts

Week 3

OPEN (Maple, 7.8, 7.9)

Week 4

7-10 Improper Integrals

(16.1,2,4,5) Algebraic and Geometric Series

Week 5

(16.5,6,7) Integral test, Comparison test, Ratio test, (absolute convergence and alternating series).

16.8 Power Series, Taylor Series

Week 6
Taylor’s formula, $e^x$, $\sin x$, $\cos x$, Error, Radius of convergence

Week 7

18-1,2,3 Differential Equations
18-5 Linear 1st order

Week 8

18-9,12 Linear 2nd order and free vibrations

Week 9

OPEN (diff eqs by Taylor Series, 9-3 Examples 1 and 2, $\cosh x$, $\sinh x$)

Week 10

10-1,2,3 Polar Coordinates
10-5 Areas in Polar Coordinates

Week 11

11-1,2,3,4,5 Vectors and Parametric Equations

Week 12

11-6,7,8,9 Products, Lines and Planes

Week 13

12-2 Velocity and Acceleration
12-3 Tangent Vectors and Arclength (Maple)

Week 14

12-4,5 Normal and Curvature
12-5 Differentiation of dot and cross products
12-6 Vectors and vector functions in Polar Coordinates

Week 15

12-6 Planetary Motion and review