Math 221: Calculus and Analytic Geometry

F. Waleffe, Fall 2001

Lecture 1, 08:50-09:40 in B102 Van Vleck Lecture 2, 09:55-10:45 in B130 Van Vleck

Check the web page for current and further information:

http://www.math.wisc.edu/~waleffe/M221/

INSTRUCTOR: Prof. Fabian Waleffe, 819 Van Vleck

TEXTBOOK: Calculus and Analytic Geometry, Thomas & Finney, 5th Ed., Chap. 1 to 6.

GRADING: There will be two evening exams (20% each) and one final (40%)

Exam 1: Thursday October 4th 5:30-7pm Exam 2: Thursday November 15th 5:30-7pm Final exam is at 5:05 pm on Friday December 21st.

There will be three 'exam warm-ups' in the form of homeworks given and due the week preceeding the exams. These are worth 4% each. The remainder of the grade will be based on your work in your Discussion and may involve quizzes, at the discretion of your TA. Calculators are NOT allowed on exams.

HOMEWORK: Suggested problems are posted on the web page.

Syllabus

Week 1, Sept 3-7 1-1,2,3,4,5 Coordinates and lines, 1-6 Functions and graphs, 1-7,8,9 Tangent and Velocity.

Week 2, Sept 10-14 1-10, 2-11 Limits and continuity, 2-1,2 The derivative

Week 3, Sept 17-21
2-3 Differentiation formulas,
2-4,5 Inverse and Implicit functions, (6-1,2,3 Inverse trig functions)

Week 4, Sept 24-28 2-8 Composite functions, chain rule, 2-9,10; 6-2,3 Differentiating trig functions.

Week 5, Oct 1-5 2-6, 2-12,13 Increments, differentials and higher derivatives

Week 6, Oct 8-12 **3-2** *Related Rates*, **3-1,3,4** *Curve plotting*  Week 7, Oct 15-19 **3-5,6** Max Min, **3-7,8** Mean Value Theorem

Week 8, Oct 22-26 **3-10** Taylor's formula, **3-9** Indeterminate forms (l'Hôpital's Rule)

Week 9, Oct 29-Nov 2 4-2,3,4 Indefinite integrals and differential equations (dy/dx = f(x), y' = y by Euler's method and Taylor's formula, y'' + y = 0). [http://www.math.wisc.edu/~waleffe/calculus/exp.pdf]

Week 10, Nov 5-9 4-5,(6),7 The definite integral (area under a curve), 4-8 The Fundamental Theorem

Week 11, Nov 12-16
4-9,10 Trapezoidal rule, notation and summary, 5-1,2 Plane Areas,
5-3 Distance, 5-9 Average value.

Week 12, Nov 19-23 5-4,5 Volumes

Week 13, Nov 26-30 6-1,2,3 Inverse Trig Functions 6-4,5,6,7 The natural log

Week 14, Dec 3-7 6-8,9,10 Log and exponential functions 6-11 Exponential growth (the equation y' = y).

Week 15, Dec 10-14 Review and/or further applications of integration: (5-7,8,10,11 Arclength, Surfaces, Center of mass)