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Class: 10 am to 1 pm, August 6 to August 22*.  
Location: A607, Alter Hall.

Office hours: 1:30 pm-2:30 pm, August 6 to August 22; or by appointment.

Note*: Due to scheduling conflicts with PhD Orientation and PhD Excel Workshop, no classes on August 9 and August 10.

Course description:
Designed to equip business Ph.D. students with basic skills in mathematics, this course prepares you for the quantitative graduate level courses. The materials covered include, but are not limited to:

- Operations involving matrices and vectors
- Relationship of matrix inversion to solutions of linear systems
- Basics of infinite series
- Common mathematical functions, especially exponential, logarithmic, and trigonometric functions
- Limits and derivatives, including partial derivatives
- Integration, multiple integration and some applications

Course material mainly follows two websites:


Evaluation:
The 3 hour class will start with a short quiz over the previous day’s material followed by lecture covering new material. There will a takehome exam after each week of class. The final takehome exam will be comprehensive and cover all materials in this 3-week course.
Tentative outline:

Week 1: Matrix Algebra
- Definitions of vectors, matrices and vector Spaces
- Addition, subtraction, products and other fundamental operators
- Matrix inversion, determinants, linear independence, rank of matrix
- Eigenvalues, eigenvectors and their relationship with matrix inversion
- Solving system of equations.

Week 2: Differential Calculus
- Functions of one and several variables, trigonometric functions, exponential and logarithmic functions
- Limits, techniques of differentiation, L’Hopital’s Rule
- Partial derivatives
- Optimization

Week 3: Infinite Series and Integral Calculus
- Techniques of integration, multiple integrals
- Variable transformation and Jacobian
- Infinite sequences and series
- Power series: convergence and divergence concepts
- Taylor series
- Applications in statistics/probability