# MATH 409 Mathematics of Finance Course Outline, 2016

## Dr. Edward Butz Sci 107

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MATH 409 (3) MATHEMATICS OF FINANCIAL DERIVATIVES

Mathematical theory of pricing a financial derivative. Topics include: Futures and forwards, Fundamental Theorem of Arbitrage Pricing, Options, Replicating portfolios, Risk-neutral pricing, One –period, multi- period models, Martingales. Price movements modeled by Brownian motion, Stochastic differential equations, Ito’s formula, Black-Scholes partial differential equation, Risk-neutral option pricing, Put-Call Parity, Jump Discontinuities, Asian Options.

OUC equivalent: MATH 414 Pre-requisite: STAT 303

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# Course Outline

## Definition of Financial Derivatives:

Futures: Equities, Commodities

## Fundamental Theorem of Arbitrage Pricing: Binary Trees Options, Put-Call Parity

Stochastic Differential Equations Ito’s Lemma

## Black-Scholes PDE Feynman-Kac Theorem Commodity Derivatives Incomplete Markets Asian Options

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| **Evaluation** |  |
| 4 Assignments @15% | 60% |
| Final Exam | 40% |