UNIVERSITY OF CALGARY

FACULTY OF SCIENCE
Department of Mathematics and Statistics

Applied Mathematics 583 / 683 Computational Finance

(see Course Descriptions for the applicable academic year: http://www.ucalgary.ca/pubs/calendar/)

Syllabus

Topics	**Number of Hours**
Asset price models: the lognormal model; other models (including, for example, mean-reversion, stochastic volatility, jump-diffusion)	6
Option valuation: options as discounted expectations; the Black-Scholes PDE and formulae	4
Model calibration: maximum likelihood and moment matching; implied volatility	5
Tree-based methods (review)	1
Finite-difference methods: relationship with trinomial trees; implicit methods; methods for American options; exotic option pricing	8
Fourier methods for option pricing	4
Monte Carlo simulation: high-dimensional valuation problems; variance reduction; path-dependent problems; quasi-Monte Carlo methods	8
TOTAL HOURS	**36**

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