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| **Week** | **Chapter** | **Topics** |
| 1 | 9 | **Parity and other option relationships:** put-call parity, generalized parity and exchange options, comparing options with respect to style, maturity and strike |
| 2 | 10 | **Binomial Option Pricing Basic Concepts:** one-period binomial tree, constructing a binomial tree, two or more binomial periods, put options, American options, options on other assets |
| 3 | 11 | **Binomial Option Pricing Selected Topics:** understanding early exercise, understanding risk-neutral pricing, the binomial tree and lognormality |
| 4 | 12 | **The Black-Scholes Formula:** derivation of the Black-Scholes options pricing formula, option Greeks, profit diagrams before maturity, implied volatility |
| 5 | 12 | **The Black-Scholes PDE:** derivation of the celebrated Black-Scholes partial differential equation and its solution via transformation to the heat equation |
| 6 |  | **Midterm Exam** |
| 6 | 13 | **Market-Making and Delta-Hedging:** what do market-makers do, market-maker risks, delta-hedging, the mathematics of delta-hedging, the Black-Scholes analysis, market-making as insurance |
| 7 | 13 | **Market-Making and Delta-Hedging:**  delta-gamma approximations, optimal delta-gamma-theta portfolio hedging, pin risk, practical considerations |
| 8 | 14 | **Exotic Options I:** introduction, Asian options, barrier options, compound  options and applications |
| 9 | 19 | **Monte Carlo Valuation:** computing the option price as a discounted expected value, computing random numbers, simulating lognormal stock prices, Monte Carlo valuation |
| 10 | 18 | **The Lognormal Distribution:** the normal distribution, the lognormal distribution, a lognormal model of stock prices, lognormal probability calculations, estimating the parameters of a lognormal distribution |
| 11 |  | **Final Exam** |