OPTIONS

This is a graduate level, applications oriented finance course. Basic knowledge of securities, financial statements and statistics should, therefore, be assumed. However, as I realize students have varied backgrounds, I structure the course to be self contained. Hence, I provide the class with the prerequisite fundamentals when necessary.

I do not use a book. My lectures serve as the core material. There will be handouts on BlackBoard. (Always consult BlackBoard for important class announcements.) There are a number of good books available:

> Hull, "Options, Futures and Other Derivatives" is analytical and concise.
> McMillan, "Options as a Strategic Investment" provides investment and trading strategies.
> Natenberg, "Option Volatility & Pricing" is intuitive and somewhat analytical, but not quantitative enough.
> Sinclair, "Options Trading" presents a nice mix, though not structured as a textbook

There will be three tests, evenly spaced during the semester. Each test is cumulative, which is natural for an analytical course such as this. There is also required homework.

My office hours are Monday 3:30 to 5PM plus other days by appointment. Room 1158.

This list of topics is ambitious. We may not be able to cover all, as it depends on students' backgrounds and preparations. I may also change the order of the presentation.

PART 0 – CASH VS. DERIVATIVE MARKETS

- Cash instruments
- Survey of derivatives

PART I – FUNDAMENTALS

- The vocabulary and jargon of options; the option contract
- Various option types and their parameters
- American, vs. European styles

- Exchange-traded vs. OTC; performance risk
- Explicit, embedded and implicit options
- Exotics
- Option payoffs
- Analytics of option value at expiration
- Basic option strategies
- Combinations
- Breakevens and breakpoints
- Synthetics
- Spreads
- Digital options
- Options in M&A

PART II – RELATIONSHIPS, VALUATION AND TRADING

- Simple minimum and maximum values
- Fair forward pricing
- Spot vs. forward ATM
- Arbitrage, intrinsic and minimum values
- Put-call parity
- "Butterflies"
- Boxes
- Early exercise of Americans?
- Factors determining an option's price, intuitively
- IV and TV over the option's curve
- All the "Greeks"
- Hedge ratios; delta neutrality
- Crucial role of volatility
- "Gamma buyers" vs. "delta buyers"
- Convexity and gamma
- Dynamic hedging: what it costs the dealer to write options
- Buying and selling vol
- Historical vs. implied vs. realized vol
- Barrier options

- Options on forwards & futures
- Asian-type payoffs
- New exciting exotics
- Summary: risks and exposure of options positions

PART III – QUANTITATIVE PERSPECTIVES

- Fundamental dynamic relationship between underlying and derivative
- Black-Scholes result
- B-S approximation
- Binomial pricing model
- Measuring volatility
- Term structure of volatility
- Annualizing volatility
- Volatility "smile"
- GARCH
- Mean reversion
- Relation between binary and ordinary option kappa
- Option spread trading

PART IV – APPLICATIONS TO FIXED INCOME AND OTHERS

- Convertible securities
- PIK bonds
- Duration of call option
- Callable bond; cancellable swap
- Swaps and swaptions
- Caps and floors
- Capped and inverse floaters
- Range notes
- Reverse convertibles
- Principal protected notes
- Sampling of structured products

- Accumulation products
- "Over/undervalued" FX via options
- Indirect volatility via FX correlations
- Yield curve via options
- Common stock as implicit option