

# Algorithmic Options Strategies

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**Abstract:** This is a 6-hour workshop on backtesting algorithmic trading strategies on options. Algorithmic traders have the ability to scan and select among hundreds of stocks, and numerous strike prices and expirations for each stock. Due to this abundance of choices and the resulting high dimensionality of the data, constructing a backtest program is challenging. Examples will be drawn from intraday event-driven trading, gamma scalping of options on futures, dispersion trading of stock and stock index options, and cross-sectional mean reversion trading of stock options.

This course will be conducted using Matlab, though expertise in this language is not required. Basic familiarity with programming and options terminology is required.

For latest course schedule, please visit [www.epchan.com/workshops](http://www.epchan.com/workshops).

## Course outline:

- A. Overview of options and volatilities
  - a. What risks do you want to hedge?
  - b. Delta, gamma, theta, and vega.
  - c. Straddles and strangles.
  - d. Volatility: realized and implied. Can we predict them?
  
- B. Event-driven trading
  - a. Can we benefit from buying volatility ahead of economic announcements?
  - b. A tale of two events.
  - c. Backtesting intraday straddles and strangles strategies with high frequency data.
  
- C. Gamma Scalping
  - a. The theoretical appeal of gamma scalping.
  - b. Is gamma scalping long or short volatility?
  - c. Backtesting gamma scalping on crude oil futures and options.
  
- D. Dispersion Trading
  - a. An analogy with index arbitrage.
  - b. The risk profile of dispersion trading.
  - c. Various implementation alternatives.
  - d. Backtesting dispersion trading on the SPX: the curse of dimensionality.
  
- E. Cross-sectional Mean Reversion of Implied Volatility
  - a. Time series vs cross-sectional mean reversion.
  - b. Does realized volatility mean-revert? Does implied volatility?
  - c. Backtesting a portfolio of stock options.

- d. Why is the return so high? Leverage of an option position.
- e. Risks of a cross-sectional mean reversion strategy on options.

*F.* Trading volatility without options

- a. Trading VX using predictions of VX return.
- b. The counter-intuitive way of trading XIV using predictions of SPY volatility.

*G.* General pitfalls and difficulties of backtesting and implementing algorithmic options strategies.