

# FE621: Computational Methods in Finance

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## Course Description

The main goal of a student enrolled in FE621 is to obtain essential computational tools used in the industry by modern financial quantitative analysts. The students are to become familiar with such methods as regression, time series analysis, decision methods, and simulation. They are to learn to apply the results to forecasting, including asset pricing, hedging, portfolio and risk assessment, investment strategies, and other financial problems. Students must have a strong mathematical background and be familiar with derivatives terminology and concepts.

## Text Books

1. Clewlow and Strickland. *Implementing Derivatives Models*. 1998. ISBN: 0471966517
2. John Hull. *Options, Futures, and Other Derivatives*. 2005. Sixth Edition. Prentice Hall. ISBN: 0131499084

**Grading** There are 4 homework assignments each worth 25%. The first three assignments are programming related, the last one is an essay question. Students are encouraged to use C++ programming language to complete the first three assignments and submit source code. All assignment are also to be submitted in PDF format (only format I can attach a grade to)

**Interwise Session** Interwise session every week on Thursday between 7:30PM – 9PM. You are expected to read the corresponding book chapters before joining the session, to prepare questions you have from reading the chapter and to ask those questions in session. Every student needs to have a headset so that you can interact during an Interwise Session.

## Schedule

Week 1:	Introduction, Black-Scholes Model; Chapters 1, Clewlow	Homework
Week 2	Binomial Tree Model, Chapter 2, Clewlow	
Week 3:	Binomial Tree Model, Chapter 2, Clewlow	
Week 4:	Trinomial Trees Methods, Chapter 3, Clewlow	
Week 5:	Finite Difference Methods, Chapter 3, Clewlow	
Week 6:	Monte Carlo Simulation, Chapter 4, Clewlow	HW1 due
Week 7:	Monte Carlo Simulation, Chapter 4, Clewlow	
Week 8:	Numerical Procedures Review, Chapters 17, Hull	
Week 9::	Estimating Volatilities and Correlations, Chapter 19, Hull	HW2 due
Week 10:	Estimating Volatilities and Correlations, Chapter 19, Hull	
Week 11:	Value at Risk, Chapter 18, Hull	
Week 12:	Value at Risk, Chapters 18, Hull	HW3 due
Week 13:	Credit Risk, Chapter 20, Hull	
Week 14	Credit Risk, Chapter 20, Hull	HW4 due