

Queens College, CUNY, Department of Computer Science
Computational Finance
CSCI 365 / 765
Fall 2018
Instructor: Dr. Sateesh Mane

Course Website: <http://venus.cs.qc.cuny.edu/~smane/cs365/>

Classes: Mon/Wed 3:10 – 4:25 pm, SB B131; 5:00 – 6:15 pm, KY 431; 3 hr., 3 cr.

Office & Hours: SB A201; Mon/Wed 12.30 – 1.30 pm (approx)

Prerequisites: CSCI 313 and MATH 241; or CSCI 314 and ECON 249 for Finance students.

Textbook: no required text.

Reference texts (optional):

- John Hull, *Options, Futures and Other Derivatives*, 10th ed.
- Daniel. J. Duffy, *Financial Instrument Pricing Using C++*.

Learning Goals:

- The emphasis of the course will be on computation and analysis, not abstract mathematics.
- **Prior knowledge of finance is not a prerequisite.**
- **Advanced mathematics such as stochastic calculus is not required.**

Course Description: Valuation of derivatives as a family of algorithmic computations, with analysis of the underlying financial model and hands-on implementation practice. Topics to be covered will include:

- time value of money (interest rates, yield curves)
- arbitrage based pricing and hedging, including risk neutral pricing and risk free portfolio
- options and Black-Scholes-Merton model
- path-dependent and ‘exotic’ derivatives (*if time permits*)
- volatility smiles (*if time permits*)
- **Students will be required to write working programs to implement the above algorithms.**
- **All coding will be in C++.**
- **Students will be required to carry out basic mathematical computations in class, using a calculator and/or spreadsheet, including questions for in-class exams.**

Grade Policy: The grading policy is as follows.

- The exams will consist of a set of in-class quizzes. Some questions may be take-home. Some exam questions will be mandatory for graduate students and optional for undergraduates.
- The dates of the quizzes may not necessarily be announced in advance.
- Homework is not officially graded. Good quality homework solutions may be counted for a grade boost.
- **Any question for which a student submits two or more different answers automatically receives a score of zero for that question.**

Academic Policy: Academic dishonesty such as plagiarism or cheating will be dealt with seriously in accord with the University’s policy on academic integrity.

A student caught cheating on any question in an exam or project will fail the entire course.