Queens College, CUNY, Department of Computer Science

Computational Finance

CSCI 365 / 765

Spring 2019

Instructor: Dr. Sateesh Mane

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

Classes: Tu/Th 1:40 – 2:55 pm, SB A101; 5:00 – 6:15 pm, SB D133; 3 hr., 3 cr.

Office & Hours: SB A201; Tu/Th 3.30 – 4.30 pm (approx)

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

Textbook:

- Sheldon Ross, *An Elementary Introduction to Mathematical Finance*, 3^{rd} ed.

Reference texts (optional):

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

Learning Goals:

- The emphasis will be not only on computation but also ***analysis.***
- **Prior knowledge of finance is not a prerequisite.**
- **Students will be expected to display independent thought,** not simply memorization of formulas.

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
- Options (and other derivatives, if time permits)
- **Students will be required to write working programs to implement the above algorithms.**
- **Students will be required to carry out 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 exams may be take-home.) Some exam questions will be mandatory for graduate students and optional for undergraduates. All graded exams have equal weight.
- The dates of the quizzes may not necessarily be announced in advance.
- The number of graded exams will be subject to the constraints of the lecture schedule.
- There may be one or more projects, totally worth approximately 10% of the total grade.
- Homework is not officially graded but good quality homework solutions may be counted for a grade boost.
- **Submission of plagiarized homework will result in a loss of grade.**
- **Student answers to exam/quiz questions which claim to know the future values of random variables will incur a loss of grade.**
- **Any question for which a student submits two or more different answers automatically receives a score of zero for that question.**
- **Students who are no show or fail any exam or project will fail the entire course.**

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.