Reading list for Mathematical Finance

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Background Books

Finance

1. Phelim P. Boyle and Feidhlim P. Boyle: **Derivatives - The Tools that Changed Finance**
2. John C. Hull: **Options, Futures and Other Derivatives (9th Edition)**
3. John C. Hull: **Options, Futures and Other Derivatives, Ninth Edition PowerPoint Slides**
4. David G. Luenberger: **Investment Science**
5. Sheldon M. Ross: **An Introduction to Mathematical Finance: Options and Other Topics**

Probability and Statistics

Distribution of random variables; Conditional probability and stochastic independence; Some special distributions; Distributions of functions of random variables; Limiting distributions; Estimation; Markov Chains; and Brownian Motion and Markov Processes.

1. Robert Hogg and Allen Craig: **Introduction to Mathematical Statistics (7th Edition)**
2. Sheldon M. Ross: **Stochastic Processes (2nd Edition)**

Econometrics

1. William H. Greene: **Econometric Analysis (7th Edition)**

Calculus and Real Analysis

Techniques of integration; Partial derivatives; Multiple integrals; Vector calculus; Optimization of multivariable functions; Ordinary differential equations. Most concepts in univariate differential and integral calculus will be used routinely.

1. J. Stewart: **Calculus, 7th Edition**

The real number system; Elements of set theory; Numerical sequences and series; Continuity; The Riemann integral; and Sequences and series of functions. Advanced abstract topics like Lebgesgue integrals and theory of measures.

1. W. Rudin: **Principles of Mathematical Analysis**
2. H. Royden and P.Fitzpatrick: **Real Analysis (4th Edition)**

Algebra (Linear Algbera and Abstract Algebra)

Matrix algebra; Determinants; Vector spaces and linear transformation; Orthogonality and projections; and Eigenvalues and eigenvectors. Topics in different algebraic structures such as groups, rings, fields etc...

1. T Lawson: **Linear Algebra, Mat Labs**
2. Gilbert Strang: **Linear Algbera and Its Applications**
3. Sheldon Axler: **Linear Algbera Done Right**
4. David S. Dummit and Richard M. Foote: **Abstract Algebra**

Additional Readings

Interview Preparation and General Readings

In a highly competitive world, it is simply not good enough just to be aware of capital markets and how they function, the mathematics of derivatives pricing and quantitative trading methods, and being able to program in C++ and Python. You would also need to prepare yourselves to be successful in the interviews.

1. P. Wilmott: **Frequently Asked Questions in Quantitative Finance (2nd Edition)**
2. T. Crack: **Heard on the Street: Quantitative Questions from Wall Street Job Interviews**
3. M. Joshi, N. Denson and A. Downes: **Quant Job Interview Questions and Answers (Second Edition)**

4. X. Zhou: **A Practical Guide To Quantitative Finance Interviews**

5. B. Jiu: **Starting Your Career as a Wall Street Quant: A Practical, No-BS Guide to Getting a Job in Quantitative Finance**

6. G. McDowell: **Cracking the Coding Interview: 150 Programming Questions and Solutions**

If you feel that you lack basic financial markets knowledge, and cannot tell your stock from your bond, or your bank from your fund, then you should make these books your bedtime readings:

1. M. Lewis: **The Big Short - Inside the Doomsday Machine**

2. M. Lewis: **Liar's Poker**

3. R. Lowenstein: **When Genius Failed - The Rise and Fall of Long-Term Capital Management**

4. E. Derman: **Models Behaving.Badly - Why Confusing Illusion with Reality Can Lead to Disaster, on Wall Street and in Life**

5. Scott Patterson: **The Quants - How a New Breed of Math Whizzes Conquered Wall Street and Nearly Destroyed it**

Learning how to program is really important in the field of quantitative finance. Learning languages such as

1. C++

2. Python

3. MATLAB

4. R

5. Excel/VBA