

STEVENS INSTITUTE OF TECHNOLOGY

FE-530-B: Introduction to Financial Engineering

Syllabus (Fall 2015)

- Instructor:** Dr. Dragos Bozdog
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Phone: (201) 216-3527
- Room:** Babbio 203
- Time:** Wednesday (3:00pm-5:30pm)
- Office Hours:** By appointment only
- Objective:** This course introduces a range of topics that the current scope of financial engineering encompasses. Topics include basic terminology and definitions, markets, instruments, positions, conventions, cash flow engineering, simple derivatives, mechanics of options, derivatives engineering, arbitrage-free theorem, efficient market hypothesis, introductory pricing tools, and volatility engineering.
- Required Textbook:** Robert L. Kosowski and Salih N. Neftci, *Principles of Financial Engineering*, 3rd Edition, Academic Press Finance, Springer (ISBN 978-0-12-386968-5)
- Software:** You may have to use a numerical analysis software for assignments. There is no specific requirement, but you have to be comfortable with the particular software or high-level programming language that you choose.
- Grading:**
- | | |
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| Assignments | 40% |
| Midterm Exam | 30% |
| Final Exam | 30% |

FE-530: Course Topics (Tentative)

	Topics
Week 1	Introduction.
Week 2	Institutional Aspects of Derivative Markets. Cash Flow Engineering, Interest Rate Forwards and Futures.
Week 3	Introduction to Interest-Rate Swap Engineering. Repo Market Strategies in Financial Engineering.
Week 4	Cash Flow Engineering in Foreign Exchange Markets. Cash Flow Engineering and Alternative Classes.
Week 5	Dynamic Replication Methods and Synthetic Engineering. Mechanics of Options.
Week 6	Engineering Convexity Positions. Options Engineering with Applications.
Week 7	Pricing Tools in Financial Engineering. Some Applications of the Fundamental Theorem.
Week 8	Midterm Exam
Week 9	Fixed Income Engineering. Tools for Volatility Engineering, Volatility Swaps, and Volatility Trading.
Week 10	Correlation as an Asset Class and the Smile. Caps/Floors and Swaptions with an Application to Mortgages.
Week 11	Credit Markets: CDS Engineering. Engineering of Equity Instruments and Structural Models of Default.
Week 12	Essentials of Structured Product Engineering. Securitization, ABSs, CDOs, and Credit Structured Products.
Week 13	Default Correlation Pricing and Trading.
Week 14	Final Exam