STEVENS INSTITUTE OF TECHNOLOGY

FE 518 - Financial Lab: Mathematica for Finance

Syllabus

Instructor: Dragos Bozdog
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Time: Thursday (11:00am-12:00pm)

Room: Hanlon Financial Systems Lab

Office Hours: By appointment

Objective: The course provides an introduction to programming, graphics, and financial data analysis using Mathematica. The students will learn programming in Mathematica Software, starting with elementary concepts, but quickly moving forward to advanced programming. The content is designed as an integrated quantitative methodology for analysis of markets, and optimal trading in stocks and options. The course is based on "hands-on" projects dealing with contemporary topics in financial mathematics and it complements theoretical courses of finance.

Recommended Textbook: Stojanovic, S., Computational financial mathematics using MATHEMATICA ; optimal trading in stocks and options, Boston: Birkhäuser, 2003. (ISBN: 978-0-8176-4197-9)

Other References: Wellin, P. Programming with Mathematica®: An Introduction, 4th Revised edition, Cambridge University Press, 2013. (ISBN: 978-1107009462)

Topics: Mathematica Language: Lists, Patterns and Rules, Functional and Procedural Programming, Graphics and Visualization, Dynamic Expressions and Optimizing Mathematica Programs

Mathematica Finance Applications: Cash Account Evolution, Stock Price Evolution European Style Options, Stock Market Statistics, Implied Volatility for European Options, American Style Stock Options, Optimal Portfolio Rules, Advanced Trading Strategies

Homework: There will be homework assignments for all section covered in this course.

Grading: Assignments – 40%
Class work – 20%
Final Exam – 40%

FE 540 WS - Course Schedule

	Topic	Readings
Week 1	Introduction to Mathematica	Lecture Notes
Week 2	The Mathematica Language	Lecture Notes
Week 3	Lists, Patterns and Rules	Ch. 1
Week 4	Functional and Procedural Programming	Ch. 2
Week 5	Graphics and Visualization	Ch. 3
Week 6	Dynamic Expressions and Optimizing Mathematica Programs	Lecture Notes
Week 7	Cash Account Evolution, Stock Price Evolution	Ch. 4
Week 8	European Style Options	Ch. 5
Week 9	Stock Market Statistics	Ch. 6
Week 10	Implied Volatility for European Options	Ch. 7
Week 11	American Style Stock Options	Ch. 8
Week 12	Optimal Portfolio Rules	Ch. 9
Week 13	Advanced Trading Strategies	Lecture Notes