

McDonough School of Business
Finc-255 Derivatives and Financial Markets

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Prerequisites: A full semester of Financial Management. Therefore, the student must have a good understanding of discounted cash flows. Additionally, the student should be comfortable with statistics (e.g. expected values, standard deviations and probability distributions) and math-calculus (e.g. differentiation, integration, e and natural logarithms.) Generally, students have also taken a corporate finance course and/or an investments course.

Description: This course program is designed to expand participants' understanding of derivative-related financial instruments (forwards, futures and options) and their use in investment and corporate financial management.

Objectives: To provide a basic understanding of derivatives and introduce the analytics of derivative valuation.

To provide practical and simple investment and corporate financial management strategies using derivatives in a manner which will allow students to apply these concepts and skills.

To practice meeting investment and corporate finance objectives with derivatives, using a series of examples.

Required Notes: The first two modules will be distributed in class. Subsequent modules are available on the MSB intranet: <https://intranet.msb.edu/faculty/bodurthj/unrestricted/teaching/syllabus-undergrad.htm>. as a hyperlink in the title of each section of in the course outline.

Required Text: You should buy the following book:

Hull, J., Options, Futures and Other Derivative Securities, 7th edition, Upper Saddle River, N.J., Prentice Hall, 2008, ISBN 978013601586-4,
 (or Hull, J., Options, Futures and Other Derivative Securities, 6th edition, Upper Saddle River, N.J., Prentice Hall, 2006, ISBN 013149908-4,
 or Hull, J., Options, Futures and Other Derivative Securities, 5th edition, Englewood Cliffs, N.J., Prentice Hall, 2003, ISBN 013009056-5,
 or Hull, J., Options, Futures and Other Derivative Securities, 4th edition, Englewood Cliffs, N.J., Prentice Hall, 2000, ISBN 013022444-8.)

(If you prefer to purchase the book alone, the accompanying CD is not necessary. Required class spreadsheet software is on the class web for download).

As the class-notes are in overhead form, you will need the text. The class note modules all have cross-references to the appropriate sections of the Hull book. It is also recommended that you keep up with the financial press. The [FT-US](#) and [WSJ](#) are good daily sources. The Wall Street Journal provides discount student subscriptions on a [quarterly](#) or a [semester](#) basis (click to access) -- as does the [FT for students](#). Weekly sources include [The Economist](#), [Barron's](#), [Business Week](#), [Fortune](#), and [Forbes](#).

Calculation: The course will require a significant amount of calculation and/or computer spreadsheet work. Please always bring your financial calculator to class.

Grading: A series of 100 point quizzes will be given at approximately three week intervals through out the semester and during the assigned final exam period. A risk management project is also due on or before our final exam session, and a project work update is required at mid-semester. The grade weight of the final project is equal to two quizzes (200 points). Historically, project grades have averaged 90-91 on a 100 point scale. The final exam period quiz is equal to 1/2 of a regular quiz (50 points, and this quiz is just a brief check on the material on your project - in most cases your grade on this quiz will equal the grade cut-off point for an "A".)

As this course concerns derivatives, you earn two grading options by taking the first quiz as scheduled: You will have the option to exclude one quiz from your final grade calculation. Additionally, you will have the option to redo one quiz question per quiz to earn back half of the points lost on the question. The options are inclusive, i.e. you have both options.

There will be **no quiz make-ups**. If, for some reason - like snow, a quiz must be **canceled for the entire class**, then the next quiz will count as a double quiz.

Quiz dates - Our first quiz is during the second class period, Wednesday - 1/20.
 Subsequent quizzes are scheduled as follows:
 Wednesday - 2/10, Wednesday - 3/3, Monday - 3/29, Wednesday - 4/14, Monday - 5/3.

The final exam session must be attended in on of the scheduled class times:
 (See <http://registrar.georgetown.edu/10A/finalexams/> for summary information, Tuesday - 5/11, 12:30pm or Thursday - 5/13, 12:30pm
 and, when available, http://registrar.georgetown.edu/10A/finalexams/exam_times.html for time and room.

Finally, on all quizzes subsequent to the first one, you earn 90 out of 100 quiz points for your work on the quiz. **You earn the additional 10 points by attending and participating in class during the three weeks leading up to a quiz.** If you do miss a class or have negative participation, then I will evaluate your excuse out of 3-5 points per class. Obviously, there will be a sign-up sheet handed out for each class, and I ask you to sit in the same seat through out the semester.

There will be a series of **required** homeworks, from 1-3 per assignments per module. Homework will be distributed in class. The homeworks are also available on the class web site, as are suggested homework answers. Any homework that is unsatisfactory or missed will result in a 5 point penalty on the associated quiz. I require that all homework be turned in with the associated quiz.

In accordance with business school policy, class grades will be curved. Based on past experience rough grade performance letter grade cutoffs (with no rounding up) are the following: A 97.5, A- 95, B+ 92, B 87, B- 82, C+ 78, C 75, C- 71, D 67, and below 67 is an F.

Course Outline:

I recommend that you look over the sections in one of the following Hull books before the material is covered in class.

- Options 7th:** Hull, J., Options, Futures and Other Derivative Securities, 7th edition,
- Options 6th:** Hull, J., Options, Futures and Other Derivative Securities, 6th edition,
- Options 5th:** Hull, J., Options, Futures and Other Derivative Securities, 5th edition
- or **Options 4th:** Hull, J., Options, Futures and Other Derivative Securities, 4th edition.

Class notes, quizzes and homework are in *.pdf or Adobe Acrobat form. If these files don't load when you click on the hyperlink line, then click for [Acrobobad download](#). Should you have trouble opening the "*.pdf" files, your browser may require an adjustment that is described in this [Word document](#).

[Review: Time Value of Money and Interest Rates](#) (if you have font problem - [word doc format](#))

Options 7th: 4.2-4.3 especially, 4.1-4.10, 6.1-6.2 (optional 6.3-6.4)

Options 6th: [4.2-4.3 especially, 4.1-4.10, 6.1-6.2 \(optional 6.5-6.6\)](#)

Options 5th: [pg. 42-44, 5.1-5.9, 5.13-5.15](#)

Options 4th: [pg. 50-53, 4.1-4.9, 4.13-4.15](#)

[Review with required answers: Time Value of Money and Interest Rates](#)

(Please focus on the first 20 pages of the handout. Exercise 1) on page 17 is required, and 2) will provide extra practice. The [Raterevw.xls](#) spreadsheet has an example of solutions.

The appendix should help you better understand all of the concepts, but officially it is "optional, but highly recommended." Prior to the quiz date, I'll be checking voice- and e-mail, and will be in my office off and on. To see background work, you may click to download an associated spreadsheet: [Intgrrte.xls](#) .)

Finally, an optional spreadsheet illustrates how to work off the benchmark Treasury yield curve (or term structure) to evaluate a risky project's cash flows by risk- and time- adjusted DCF - [Term DCF RP.xls](#).

Current_Quiz Practice	Suggested Answers
Quiz-01	Quiz-01
Quiz-01a	Quiz-01a

No homework with quiz. Redo is to be handed with next quiz.

Articles: [Bond Funds Take on \(High-Yield\) Risk To Lift Returns](#)
[Muni \(Upward Sloping Curve\) Bonds Attract Arbs](#)

Notation: Abbreviations and Symbols

1. Forward and Futures Prices

Options 6th and 7th: 1.3, 5.3-5.7

Options 5th: 1.3, 3.4 - 3.8

Options 4th: 1.1, 3.1 (pp. 53-59) - 3.5

2. Judgmental, Historical, and Regulatory Volatility (click on title link for pdf file)

Options 7th: 13.1-13.2, 13.4, 20.1, 21.1-21.2; optional 13.3, 20.2-20.3, 21.3-21.6

Options 6th: 13.1-13.2, 13.4, 18.1, 19.1-19.2; optional 13.3, 18.2-18.3, 19.3-19.6

Options 5th: 12.1-12.2, 12.4, 16.1, 17.1-17.2; optional 12.3, 12.12, 16.2-16.3, 17.3-17.6

Options 4th: 11.1-11.3, 14.1-14.2, 15.1-15.2; optional 15.3-15.7

[Empirical Distribution vs. Normal Distribution Test with Sampled Mean and Standard Deviation](#)

3. Market Benchmarked Expectations, Volatility, and Price Value @ Risk (click on title link for pdf file)

Objectives

To relate forward-futures price, risk premia, and expected spot prices

To understand price value @ risk concepts, and implement in practice

Structure

Forward-futures and expected market (inferred) spot

Price risk management application

Details: JP Morgan Riskmetrics and Price Value @ Risk

Options 7th: 5.15, 20.1, 20.6-20.8 and 20.summary; optional Chapter 3, 20.4-20.5 and 20.9

Options 6th: 5.15, 18.1, 18.6-18.8 and 18.summary; optional Chapter 3, 18.4-18.5 and 18.9

Options 5th: 3.15, 16.1, 16.6-16.8 and 16.summary; optional Chapter 4, 16.4-16.5 and 16.9

Options 4th: 3.12, 14.2, 14.7-14.9, 14.summary

4. Implied Volatility and Its Term Structure (click on title link for pdf file)

Objectives

To understand how implied volatility is measured, its importance, and the patterns of option value implied volatility across time and future spot prices

Structure

Implied Volatility Exercises

Currency Option Pricing and

Implied Vols [[OPTPRICE.XLS](#)]

Direction and Volatility Option Strategies

S&P 500 Volatility History

(Optional) S&P 500 option

volatility "Smiles/Smirks"

[[OPTIMPVL.XLS](#), a variant of [OPTSIMPL.XLS](#)]

Options 7th and 6th: Chapters 13 (1-4, 8-9, 11)

Options 5th: Chapters 12 (1-5, 8-9, 11), optional 16.4

5. Forwards and Futures

Options 6th and 7th: 1.4, Chapter 2, 5.9-5.12; optional: 5.13- 5.14, 6.2-6.3, Chapter 7 (Not 5.Appendix proof)

Options 5th: 1.4, Chapter 2, 3.9-3.12; optional: 3.13- 3.14, 5.10-5.12, Chapter 6 (Not Appendix 3A proof)

Options 4th: 1.2, Chapter 2, 3.6-3.9; optional: 3.10- 3.11, 4.10-4.12 (Not Appendix 4A proof)

You should begin your [project work \(Module 11\)](#) with suggested assignments #I and, then, #1.
[Example for S&P 500 December Maturity \(SPZ7\) pdf](#)

6. [Option fundamentals: calls, puts, and underlying](#)

Options 6th and 7th: 1.5-1.7, Chapter 8 and 9

Options 5th: 1.5-1.7, Chapters 7 and 8

Options 4th: 1.3, 1.4, Chapters 6 and 7

7. [Option Positions and Strategies](#)

Options 6th and 7th: Chapter 10

Options 5th: Chapter 9

Options 4th: Chapter 8

Optional: [Structured Bond Products](#) (+B-C, etc.)

Options 7th: 294-296 566-567, 599-602, 647-648

Options 6th: 298-300, 520-523, 540-541, 614

Options 5th: 249-250, 445-456, 511

Options 4th: 253-254, 469-470, 533-534, 646-648

Also see, [Innovation in International Money and Bond Markets: A Source of Lower Borrowing Costs?](#)

8. [Black-Scholes-Merton Model Sensitivities](#)

Options 7th: Chapters 13 and 15; optional Chapter 17

Options 6th: Chapters 13 and 14; optional Chapter 15

Options 5th: Chapters 12 and 13; optional Chapter 14

Options 4th: Chapters 11 and 12; optional Chapter 13

Additional: [Chance, D., An Introduction to Derivatives, 4th ed., pp. 139-150](#)

[Cox-Rubinstein, Option Markets, 1985, 5.8, pp. 215-235](#)

9. [Binomial and Black-Scholes Option Valuation](#)

Options 7th: 11, 19.1-19.5; optional 12, 17.6-17.8

Options 6th: 11, 17.1-17.5; optional 12, 17.6-17.8

Options 5th: 10, 18.1-18.5; optional 11, 18.6-18.9

Options 4th: 9, 16.1-16.5; optional 10, 16.6-16.9

10. [Synthetic Options and the Cost of Insurance](#)

[Risk Management](#) - full text version

Options 6th: Chapters 3 and 18

Options 5th: Chapters 4 and 16

Options 4th: Chapter 14

11. Project Materials- [Overview \(pdf\)](#) ([Group Listing](#), [Alphabetical Listing](#))

[WSJ and Web-based Information on futures and options markets](#)

[Project Assignment #1 \(pdf\)](#), [forecasts.org](#)

[Project Assignment-Web #2. \(pdf intro\)](#)

[Project Assignment #3 \(pdf\)](#)

Announcements

From time to time, we'll have optional sessions on current topics. The link is the following:

[Current Events](#)

Additional Suggested References -

Bodurtha, J. and Courtadon G., The Pricing of Foreign Currency Options, New York, Salomon Brothers Center, New York University, 1987-4/5.
 Chance, D., An Introduction to Derivatives, New York, Dryden, 1998.
 Cox, J. and M. Rubinstein, Options Markets, Englewood Cliffs, N.J., Prentice-Hall, 1985, ISBN 0136382053.
 Figlewski, S., W. Silber and M. Subrahmanyam, Financial Options, : From Theory to Practice, Homewood, Illinois, Business One Irwin, 1990, ISBN 1556232349.
 Jarrow, R.A. and A. Rudd, Option Pricing, Homewood, Illinois, Dow Jones-Irwin, 1983, ISBN 0870943782.
 Jarrow, R.A. and S. Turnbull, Derivative Securities, Cincinnati, Ohio, South-Western, 1996.
 McDonald, Derivatives Markets, Boston, MA, Addison-Wesley Publishing, 2002, ISBN: 0201729601
 Rubinstein, Mark, In-the-Money, <http://www.in-the-money.com/body.htm>, hard copy is Rubinstein on Derivatives, London, Risk Books, ISBN 1899332537.
 Stoll, H. and R. Whaley, Futures and Options: Theory and Applications, Cincinnati, Ohio, South-Western, 1993, ISBN 0538801158.

Derivatives Used in Practice -

Bookstaber, R.M., Option Pricing and Investment Strategies, Chicago, Probus, 1991, ISBN 1557381453.
 Burghardt, Galen, The Eurodollar Futures and Options Handbook, New York, McGraw-Hill, 2003, ISBN 0071418555.
 Gastineau, G.L., The Stock Options Manual, 3rd edition, New York, McGraw-Hill, 1988, ISBN 0070229813.
 Gatheral, Jim, The Volatility Surface: A Practitioner's Guide, Hoboken, Ny Finance, 2006, 9780471792512.
 Kolb, R.W., Financial Derivatives, Miami, Kolb Publishing, 1993, ISBN 1878975188.
 Kolb, R.W., Understanding Futures Markets, 3rd edition, Miami, Kolb Publishing, 1991, ISBN 187897503X.
 McMillan, L.G., Options as a Strategic Investment, 3rd edition, New York, New York Institute of Finance, 1993, ISBN 0136360025.
 Natenberg, S., Option Volatility and Pricing: Advanced Trading Techniques, 2nd edition, Chicago, Probus, 1994, ISBN 155738486X.
 Schwarz, E.W., Financial Futures: Fundamentals, Strategies and Applications, Homewood, Illinois, Irwin, 1986, ISBN 0256030057.
 Siegel, D.R. and D.F. Siegel, The Futures Markets, Chicago, Probus, 1990, ISBN 1557385726.
 Smith, Jr., C.W. and C.W. Smithson, The Handbook of Financial Engineering, New York, Harper & Row, 1990, ISBN 0887304486.
 Risk, From Black-Scholes to Black Holes, London, Risk, 1993, ISBN 0 9516453 31.
 Taleb, Nassim, Dynamic Hedging: Managing Vanilla and Exotic Options, New York, Wiley, 1997, ISBN-10 0471152803, ISBN-13 [978-0471152804](https://www.isbn-international.org/number/978-0471152804).
 Tompkins, R.G., Options Analysis, Chicago, Probus, 1994, ISBN 1557388342.

More technical -

Ingersoll, J., Theory of Financial Decision Making, Totowa, N.J., Rowman & Littlefield, 1987, ISBN 0847673596.
 Shimko, D., Finance in Continuous Time: A Primer, Miami, Kolb Publishing, 1992, ISBN 1878975072.
 Wilmott, Paul, J. Dewynne and S. Howison, Option Pricing: Mathematical Models and Computation, Oxford, Oxford Financial Press, 1993, ISBN 0952208202.

PostScript

[Derivative Events](#)

[Enron](#)

[Highlights of Enron Documents](#)