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Fall 2019

MATH 432-H01: Mathematics of Financial Derivatives I

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THE DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 432H: Honors - Mathematics of Financial Derivatives I (Capstone I)

Fall 2019 Course Syllabus

NJIT Academic Integrity Code: All Students should be aware that the Department of Mathematical Sciences takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

COURSE INFORMATION

Course Description: Mathematical analysis of models encountered in the area of financial derivatives. Topics include modeling and analysis of futures markets, determination of future prices, hedging strategies, swaps, option markets, stock options and their trading strategies.

Number of Credits: 3

Prerequisites: MATH 222 with a grade of C or better and MATH 346 with a grade of C or better.

Course-Section and Instructors

| Course-Section | Instructor |
|----------------|------------------------|
| Math 432-H01 | Professor K. Rappaport |

Office Hours for All Math Instructors: [Fall 2019 Office Hours and Emails](#)

Required Textbook:

| | |
|-----------|----------------------------|
| Title | <i>Derivatives Markets</i> |
| Author | McDonald |
| Edition | 3rd |
| Publisher | Addison Wesley |
| ISBN # | 978-0321543080 |

University-wide Withdrawal Date: The last day to withdraw with a W is **Monday, November 11, 2019**. It will be strictly enforced.

POLICIES

DMS Course Policies: All DMS students must familiarize themselves with, and adhere to, the [Department of Mathematical Sciences Course Policies](#), in addition to official [university-wide policies](#). DMS takes these policies very seriously and enforces them strictly.

Grading Policy: The final grade in this course will be determined as follows:

| | |
|----------------------|-----|
| Homework and Quizzes | 15% |
| Project | 15% |
| Midterm Exams | 40% |
| Final Exam | 30% |

Your final letter grade will be based on the following tentative curve.

| | | | |
|----|----------|---|---------|
| A | 90 - 100 | C | 65 - 75 |
| B+ | 86 - 89 | D | 55 - 64 |
| B | 80 - 85 | F | 0 - 54 |
| C+ | 76 - 79 | | |

Attendance Policy: Attendance at all classes will be recorded and is **mandatory**. Please make sure you read and fully understand the **Math Department's Attendance Policy**. This policy will be strictly enforced.

Homework: Integrity - Your work is expected to be your own. Help from tutors, classmates etc is encouraged but you are responsible for mastering the material. Homework will be assigned at all classes. Homework will be collected and periodic quizzes will be given. Late homework will not receive full credit. There will be no makeup tests, quizzes, or homework.

Exams: There will be two midterm exams held in class during the semester and one comprehensive final exam. The final exam will be held during the following week:

| | |
|-------------------|------------------------|
| Midterm Exam I | Lecture 9 |
| Midterm Exam II | Lecture 19 |
| Final Exam Period | December 14 - 20, 2019 |

The final exam will test your knowledge of all the course material taught in the entire course. Make sure you read and fully understand the **Math Department's Examination Policy**. This policy will be strictly enforced.

Makeup Exam Policy: There will be **NO MAKE-UP QUIZZES OR EXAMS** during the semester. In the event an exam is not taken under rare circumstances where the student has a legitimate reason for missing the exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the Math Department Office/Instructor that the exam will be missed.

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times.

ADDITIONAL RESOURCES

Math Tutoring Center: Located in the Central King Building, Lower Level, Rm. G11 (See: **Fall 2019 Hours**)

Further Assistance: For further questions, students should contact their instructor. All instructors have regular office hours during the week. These office hours are listed on the Math Department's webpage for **Instructor Office Hours and Emails**.

All students must familiarize themselves with and adhere to the Department of Mathematical Sciences Course

Policies, in addition to official university-wide policies. The Department of Mathematical Sciences takes these policies very seriously and enforces them strictly.

Accommodation of Disabilities: Disability Support Services (DSS) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please contact Chantonette Lyles, Associate Director of Disability Support Services at [973-596-5417](tel:973-596-5417) or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Disability Support Services office authorizing your accommodations will be required.

For further information regarding self identification, the submission of medical documentation and additional support services provided please visit the Disability Support Services (DSS) website at:

- <https://www.njit.edu/studentsuccess/accessibility/>

Important Dates (See: [Fall 2019 Academic Calendar](#), [Registrar](#))

| Date | Day | Event |
|----------------------|-------|------------------------------|
| September 3, 2019 | T | First Day of Classes |
| September 13, 2019 | F | Last Day to Add/Drop Classes |
| November 11, 2019 | M | Last Day to Withdraw |
| November 26, 2019 | T | Thursday Classes Meet |
| November 27, 2019 | W | Friday Classes Meet |
| November 28-29, 2019 | R-F | Thanksgiving Recess |
| December 11, 2019 | W | Last Day of Classes |
| December 12, 13 2019 | R & F | Reading Days |
| December 14-20, 2019 | F - R | Final Exam Period |

Course Outline

| Lecture | Section | Topic | Assignment |
|---------|-----------|----------------------------|-------------------------|
| 1 | Chapter 1 | Introduction | 1 - 8 |
| 2 | Chapter 2 | Forwards & Options | 1, 4a - c, 5b, b, 6 - 8 |
| 3 | Chapter 2 | Forwards & Options | |
| 4 | Chapter 2 | Forwards & Options | 13, 14, 16 |
| 5 | Chapter 2 | Forwards & Options | |
| 6 | Chapter 2 | Forwards & Options | |
| 7 | Chapter 3 | Collars & Other Strategies | 1- 5 |
| 8 | Chapter 9 | Parity | 1, 2, 3b |
| 9 | | EXAM | |
| 10 | Chapter 3 | Collars & Other Strategies | 6 - 8 |
| 11 | Chapter 3 | Collars & Other Strategies | 9.1 |
| 12 | Chapter 3 | Collars & Other Strategies | 11, 12 |

| | | | |
|----|-----------|----------------------------|-----------------|
| 13 | Chapter 3 | Collars & Other Strategies | 13 - 15, 18, 20 |
| 14 | Chapter 4 | Intro to Risk Management | 1 - 3 |
| 15 | Chapter 4 | Intro to Risk Management | 4 - 6 |
| 16 | Chapter 4 | Intro to Risk Management | 7 - 9 |
| 17 | Chapter 4 | Intro to Risk Management | 10 - 12 |
| 18 | Chapter 4 | Intro to Risk Management | 15 - 17 |
| 19 | | EXAM | |
| 20 | Chapter 5 | Forwards & Futures | 1 - 3 |
| 21 | Chapter 5 | Forwards & Futures | 4 - 6 |
| 22 | Chapter 5 | Forwards & Futures | 7, 8, 10 |
| 23 | Chapter 5 | Forwards & Futures | 11, 12, 13 |
| 24 | Chapter 5 | Forwards & Futures | 14, 16 |
| 25 | Chapter 8 | Swaps | 2 - 5 |
| 26 | Chapter 8 | Swaps | 8 - 10 |
| 27 | Chapter 8 | Swaps | 13, 14 |
| 28 | Chapter 8 | Swaps | |

*Updated by Professor K. Rappaport - 7/23/2019
Department of Mathematical Sciences Course Syllabus, Fall 2019*
