

THE DEPARTMENT OF MATHEMATICAL SCIENCES

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

Fall 2020 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 2020 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 9, 2020**. 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	13%
Research Project 1	15%
Research Project 2	25%
Mini Projects	12%
Bloomber Modules	15%
Final Exam	20%

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

A	90 - 100	C	65 - 76
B+	87 - 89	D	55 - 64
B	80 - 86	F	0 - 54
C+	77 - 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.

Projects: There will be two research projects for your selected companies. Project 1 is 15%, Project 2 is 25%.

There will be 3 mini-projects for the selection of companies. You are required to take the 4 core concepts modules and their tests for the Bloomberg terminals. They will need to be completed by a mid-semester date TBD. The Bloomberg login information will be posted for the class. If you are on campus and can access the Bloomberg terminals you can take the fifth module on the terminal and become Bloomberg certified. This is encouraged if you are able, but it is not required to get the certification for this class.

Exams: Exams will be proctored by using both Respondus LockDown Browser+Monitor and Webex. Students will be required to join a Webex meeting from their phone with their cameras on, and to access the exam through LockDown Browser on a Mac or Windows PC with webcam. Students must follow all instructions related to environment checks and camera positioning. After the exam is submitted the student will log out of Respondus and will then be required to submit their work upload within 15 minutes of submitting their exam.

There will be one comprehensive final exam. The final exam will be held during the following week:

Final Exam Period	December 15 - 21, 2020
-------------------	------------------------

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 2020 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 Kupfrian Hall, Room 201. 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 2020 Academic Calendar](#), [Registrar](#))

Date	Day	Event
September 1, 2020	T	First Day of Classes
September 5, 2020	S	Saturday Classes Begin
September 7, 2020	M	Labor Day
September 8, 2020	T	Monday Classes Meet
September 8, 2020	T	Last Day to Add/Drop Classes
November 9, 2020	M	Last Day to Withdraw
November 25, 2020	W	Friday Classes Meet
November 26-29, 2020	R - Su	Thanksgiving Recess - University Closed
December 10, 2020	R	Last Day of Classes
December 11 & 14, 2020	F & M	Reading Days
December 15 - 21, 2020	T - M	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	Chapter 3	Collars	
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	Chapter 5	Forwards & Futures	
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 - 8/30/2020
Department of Mathematical Sciences Course Syllabus, Fall 2020*
