

MATH 433-H02: Mathematics of Financial Derivatives II (Capstone II) *Spring 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 with emphasis on numerical methods. Topics include: Binomial Trees, Black Scholes Models, Finite Difference Methods. Effective From: Spring 2014.

Number of Credits: 3

Prerequisites: Math 432. **Corequisite:** Math 340 with a grade of C or better. Math 432 with a grade of C or better.

Course-Section and Instructors

Course-Section	Instructor
Math 433-H02	Professor K. Rappaport

Office Hours for All Math Instructors: [Spring 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, April 6, 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 and Quizzes	10%
Projects	25%
Midterm Exam I	20%
Midterm Exam II	20%
Final Exam	25%

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.

AttendanceNote

Homework Policy: Assigned homework will be collected.

Quiz Policy: There will be announced quizzes periodically.

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

Midterm Exam I	Lecture 9
Midterm Exam II	Lecture 19
Final Exam Period	May 8 - 14, 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: **Spring 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: [Spring 2020 Academic Calendar](#), [Registrar](#))

Date	Day	Event
January 21, 2020	T	First Day of Classes
January 31, 2020	F	Last Day to Add/Drop Classes
March 15 - 22, 2020	Su-Su	Spring Recess: No Classes/ University Open
April 6, 2020	M	Last Day to Withdraw
April 10, 2020	F	Good Friday - University Closed
May 5, 2020	T	Friday Classes Meet - Last Day of Classes
May 6 & 7, 2020	W & R	Reading Days
May 8 - 14, 2020	F - R	Final Exam Period

Course Outline

Lecture	Section	Topic	Assignment
1	Chap 9.3	Put/Call Parity	13-16
2	Chap 9.3	Put/Call Parity	13-16
3	10.1-10.3	Binomial Option Pricing	1-8, 10-13
4	10.1-10.3	Binomial Option Pricing	1-8, 10-13
5	10.4,11.1-2	Binomial Option Pricing	14-20, 1-5
6	10.4,11.1-2	Binomial Option Pricing	14-20, 1-5
7	11.3-11.5	Binomial Option Pricing	14,16,17,20
8	11.3-11.5	Binomial Option Pricing	14,16,17,20
9		EXAM	
10	20.1-20.4	Brownian Motion	1,2
11	20.4 -20.6	Ito's Lemma	3,4
12	20.4 -20.6	Ito's Lemma	3,4

13	20.4 -20.6	Ito's Lemma	3,4
14	20.4 -20.6	Ito's Lemma	3,4
15	12.1-12.3	Black Scholes	1-7
16		Spring Recess	
17		Spring Recess	
18	12.1-12.3	Black Scholes	1-7
19		EXAM	
20	12.4-12.6	Black Scholes	9,14ab,15ab,16ab
21	13.1-13.3	Delta Hedging	1,2,3
22	13.4-13.6	Delta Hedging	4,13,14
23	13.4-13.6	Delta Hedging	4,13,14
24	14.1-14.3	Exotic Options	1-8
25	14.1-14.3	Exotic Options	1-8
26	14.4-14.6	Exotic Options	9-12,16,18,20,21abc
27	14.4-14.6	Exotic Options	9-12,16,18,20,21abc
28	24.1-24.5	Interest Rate Models	1abc,2abc,9,12
29	24.1-24.5	Interest Rate Models	1abc,2abc,9,12
30		REVIEW	

*Updated by Professor K. Rappaport - 1/20/2020
Department of Mathematical Sciences Course Syllabus, Spring 2020*
