THE OHIO STATE UNIVERSITY

BUSFIN 4229: OPTIONS AND FUTURES
AUTUMN 2023

INSTRUCTOR:	Dr. Pirim
OFFICE:	242 Fisher Hall
E-MAILS:	pirim.1@osu.edu *(Please email with the subject "BUSFIN 4229)*
	Please allow 24 hours to respond.
WEB PAGE:	Carmen
	Tue/Thu 9:35 am – 10:55 am (ET)- SH 315
CLASS TIMES AND ROOMS:	Tue/Thu 11:10 am – 12:30 pm (ET)- SH 230
	Tue/Thu 12:45 pm – 2:05 pm (ET)- SH 230
VIRTUAL OFFICE HOURS:	Thursdays 2:30 pm – 3:30 pm (ET) OR
	by appointment, please email with the subject "BUSFIN 4229"
TEXTBOOK:	McDonald., R., "Derivatives Markets", 3rd Edition, Prentice Hall, Pearson.
	ISBN-13: 978-0321543080 (Hardcover)

Course Description

This course is designed to introduce you to financial derivatives market. *Financial derivatives* have become an indispensable part in today's economy. Examples are stock options, oil futures, currency contracts, credit derivatives and much more. They are used for *compensation*, *speculation*, *yield enhancements* of investments, and, most importantly, for *risk management*. Since every company is exposed to some sort of risk, there is virtually no company that does not deal with derivatives in some way.

The course starts with a general look at using futures and options to hedge exposure to different types of risk. We then analyze each of the main types of derivatives in turn, starting with forwards and futures moving on to options. This analysis will use no arbitrage arguments to determine how to construct a fair contract between the parties involved and how to value this contract as time and the value of the underlying asset change. As a side effect of the no arbitrage arguments we also construct arbitrage strategies to take advantage of any mispriced derivate products.

This course last explores the valuation of forwards, futures and options, forward-based, and option-based financial instruments. While the techniques for the valuation of options and futures at first might appear advanced and difficult, they are easily and conceptually digestible. Upon completion of the course you should have a good grasp of the practical uses of financial forwards/futures and option contracts as well as being able to calculate key parameters for each.

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Course Objectives

By the end of this course, students should successfully be able to:

(1) understand the basic concepts and principles of financial derivatives contracts; forwards, futures and options.

(2) learn skills used in derivative contract analysis and valuation,

(3) evaluate trading and speculation opportunities available in the current financial markets, and

(4) assess the influence of economic events upon pricing.

Prerequisite

Derivatives valuations is a technically demanding area, and although no math other than algebra is required, students should be comfortable with basic statistics (such as variance, correlation, linear regression and distribution) and fundamental finance topics (principally time value of money and compounding). Occasionally concepts will be explained using some calculus, but this should only require a basic conceptual understanding.

Course Materials

Required Textbook

Title: "Derivatives Markets", 3rd Edition, and Prentice Hall-Pearson

Author: Robert L. McDonald

ISBN-13: 978-0321543080 (Hardcover)

This book is available at the bookstore and at www.amazon.com

Course Structure

Mode of delivery: This course is designed and conducted as an in-person model that means you **must** be on campus to complete the course. Hence, lectures will be live, and you must attend in-person. There will **NOT** be a virtual option offered and there will be no class recordings.

"The mode of instruction for each class is determined by the university and is subject to change at the discretion of the university in reliance on the guidance received from the U.S. Centers for Disease Control and Prevention, the Ohio Department of Health and local health authorities. Unless altered by the university, all classes must be taught in the listed mode of instruction. Instructors are not expected to present sections in multiple teaching modes. Students who are uncomfortable taking courses in-person should consult with their advisor about distance learning options. "

Pace of activities: This course is divided into weekly modules as specified in the tentative schedule below. Students are expected to keep pace with weekly deadlines as well as assignments' due dates but may schedule their efforts freely within that time frame.

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Office hours will be VIRTUAL (see below) or in person by appointment:

Office hours on Thursdays 2:30 pm – 3:30 pm (ET)

Join Zoom Meeting:
https://osu.zoom.us/j/4637699590?pwd=d202c2Y3RkhTdFdkYmV0MlFxeERjdz09
Meeting ID: 463 769 9590
Password: 1234

Credit hours and work expectations: This is a 3-credit-hour course. According to Ohio State policy, students should expect around an average of 3 hours per week of time spent on direct instruction (instructor content and Carmen activities) in addition to 6 hours of homework (reading and assignment preparation).

Attendance and participation requirements:

Attendance and participation are both very important for this course as it is easy to get behind in the study of derivatives. Therefore, I encourage to come to class and ask questions. To do well, you **must keep up with the reading and stay focused throughout the semester.** This will help your understanding of the concepts as they are discussed. Even though there is no participation grade, you can earn **1 BONUS POINT** towards your overall grade if you do not miss class more than twice.

Lecture Materials

There will be lecture materials such as power point slides, handouts, sample problems and solutions to at the end of chapter problems on CARMEN. In addition, any other materials will be posted in the form of MS Word, Power Point and/or Adobe Acrobat files. You are responsible for all material posted on Carmen. Lecture may go beyond the scope of the textbook for certain topics. Therefore, it is important for you to attend every class session as well as virtual Zoom office hours and ask questions. You are responsible for all announcements made in class. Class lectures will sometimes involve working through problems. After class, I encourage you to do the calculations again yourself without looking at solutions. And if you are struggling with the material reach out to me as soon as possible.

Suggested End-of-Chapter Problems (Optional)

The course textbook has a set of problems at the end of each chapter. These questions are designed to help students assess their understanding of chapter topics. Some of these problems/questions will be selected from each chapter and will be posted on Carmen. Students should try to answer these problems after they finish reading a chapter to check their understanding of the topics covered.

Suggested Readings (Optional)

Wall Street Journal: www.wsj.com
Financial Times: http://www.ft.com/home/us
Bloomberg: www.bloomberg.com
Yahoo! Finance: http://finance.yahoo.com/
Freakonomics: http://freakonomics.blogs.nytimes.com/
Real Time Economics (WSJ): http://blogs.wsj.com/economics/
Calculated Risk: http://www.calculatedriskblog.com/
Economy and Economics of Everyday Life: http://economix.blogs.nytimes.com

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Other Sources

I strongly encourage students to do regular reading of the financial press, such as the Wall Street Journal, Financial Times, or the business section of the New York Times. There also are websites dedicated to derivatives markets.

Futures Magazine (http://www.futuresmag.com) provides information on daily trading. Also, information about stock trading, including real-time access to news and option and stock quotes can be found on the web site of the Chicago Board of Options Exchange (CBOE, http://www.cboe.com).

Other tools such as Bloomberg and DataStream International that were used in previous finance classes also will be useful in this course.

Course Website

The course website is located on Carmen. A student must be registered for the course to access the course web site.

Important Resources on the Course Website:

- Course syllabus
- Supplemental course material used (or mentioned) in class
- Lecture notes (PowerPoint slides)
- Course announcements
- Problem sets and solutions
- Detailed solutions for suggested end-of-chapter problems in the course text
- Posted exam scores (privately for each student)
- Exam formulas
- **Logging in Carmen**: Be sure you are logging in to the course in Carmen on a regular basis.

Course Technology:

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at ocio.osu.edu/help/hours, and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** ocio.osu.edu/help
- **Phone:** 614-688-4357(HELP)
- **Email:** servicedesk@osu.edu
- **TDD:** 614-688-8743

Required Technology skills specific to this course

- CarmenZoom virtrual meetings
- Basic computer and web-browsing skills
- Navigating Carmen: for questions about specific functionality, see the Canvas Student Guide

Required equipment

- Calculator
- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone
- Other: a mobile device (smartphone or tablet) or landline to use for BuckeyePass authentication

Required software

- Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found at go.osu.edu/office365help

Carmen access

You will need to use BuckeyePass multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes button** that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.
- If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

Use of Artificial Intelligence (AI): Unless I specifically mention otherwise (and in writing), the use of any AI-generated content in any deliverables in this course will be considered academic misconduct and will be acted on as such. Writing assignments will be turned in online and I will be using Turnitin and other applications that have AI detection algorithms. You need to complete the assignments using your own brain and your own thinking…which will lead to more of your own learning!

Course Requirements and Policies:

Exam Policy:

There will be two in-person examinations: midterm and final, in this course. Exam questions will be similar to the examples and problem sets used in class, and I reserve the right to make any changes appropriate for the administration and evaluation of the class. The midterm and final exams will be 100 points each. There will be multiple choice section and problem section in each exam. The multiple-choice questions will involve both conceptual questions as well as analytical and calculation questions, based on materials covered in class, assignments and suggested problems at the back of each chapter.

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All exams are closed-book/notes however a formula sheet will be provided during each exam. Each exam will cover certain topics in the course. The topics and related textbook chapters covered by each exam can be found in the **Tentative Course Schedule.**

Students should have for each exam:

1. A financial calculator
2. A valid picture ID. You will not be permitted to take an exam without presenting a **valid photo ID**.

Exam schedule:

Midterm Exam**: October 10th, Tuesday (During Class)**

Final Exam**: December 11th, Monday from 6:00pm to 7:45 pm at Dreese Lab 113 & Journalism Bldg. Rm 360**

Make-up Exams:

As a general rule, make-up exams are NOT given in this course. However, a student may be allowed to take a make-up exam, if in the opinion of the instructor, there are special or extenuating circumstances. Without permission to take a make-up exam, failure to take an exam will result in grade of zero on the exam in question. Every effort should be made (e.g. email, voicemail, message with the Finance Department Office) to notify the instructor at least 24 hours in advance. The date/time of the make-up exam will be scheduled according to the instructor's schedule by the instructor.

Under no circumstances will a student be excused from an exam!

Problem Sets:

There will be total 5 problem sets. The problem sets will be posted on Carmen no later than 5:00 pm on the day indicated below in Table 1 and will be due on the day given at 11:59 pm in the Table 1. Solutions will be posted on Carmen, and no late problem sets will be accepted. You can work in a group **no more than three people** and submit **one copy per group**. Also, please remember that **late assignments will not be accepted**.

Faculty feedback and response time:

We are providing the following guidelines to give you an idea of our intended support throughout the course.

Grading and feedback:

- Problem set grades will be posted on Carmen within 7 days after the due date.
- Exam scores should be posted on Carmen on the test date.

E-mail:

I will generally reply to e-mails within 48 hours on school days and on many weekends.

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Course Grading Policy:

Your final course grade will be determined by the following:

Category	Date	Max Points	Percentage of total grade
Midterm Examination	October 10th, Tuesday	100 points	35 %
Problem Sets (Best 4 out of 5, max 25 points each)	See Below Assessment Timetable	100 points	25 %
Final Examination	December 11th, Monday	100 points	40 %

Total Course Grade = 0.4 x (Final Exam Grade) + 0.35 x (Midterm Exam Grade) +0.25 x (Best 4 Problem Sets Grade)

After the total course grade has been calculated for all students, the average for the class is calculated. If the course class average is below 75%, a curve adjustment is applied. The curve adjustment equals 75% minus the course class average. If the course class average is equal or above 75%, a curve adjustment is not applied (that is curve adjustment is zero). **There will be NO extra credit work available in this course.**

The course grade will be converted to a letter grade for the course using the following grading scale:

Grading scale:

A	93 – 100	B+	87–89.9	C+	77–79.9	D+	67 –69.9	E	Below 60
A-	90 – 92.9	B	83–86.9	C	73–76.9	D	60 –66.9		
		B-	80–82.9	C-	70 –72.9				

I reserve the right to correct grades recorded on the course website, should I determine such entries were posted incompletely or incorrectly.

Academic Integrity Policy:

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct (https://trustees.osu.edu/bylaws-and-rules/code) and this syllabus may constitute Academic Misconduct (https://oaa.osu.edu/academic-integrity-and-misconduct)

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The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If we suspect that a student has committed academic misconduct in this course, we are obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact us.

Accommodations for Accessibility:

Student COVID-related Accommodation Process

The university is committed to supporting students and program participants with COVID-19 based risk factors. Student Life Disability Services, in conjunction with the Office of Institutional Equity, will work with students who are vulnerable to complications from COVID-19 to ensure that they have the necessary resources to participate in university life as safely as possible. Ohio State students from any campus may submit a COVID-related accommodation request. Students registered with Student Life Disability Services can work directly with their assigned Access Specialist to modify their accommodations or make additional COVID-based accommodation requests.

COVID Process Addition

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

SLDS contact information:

slds@osu.edu; 614-292-3307

098 Baker Hall,

113 W. 12th Avenue.

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Accommodated Exams - COVID-19 Operational Adjustments

Students with the following exam accommodations may schedule to take their exams at SLDS:

- Accessible formats (e.g. braille, large print, screen-free)
- Assistive technology (e.g. JAWS, CCTV)
- Private testing room accommodation
- Test assistant (reader or scribe)

Students requesting exam accommodations not listed above, such as extended time or a small-group testing space through SLDS. For more information on operational changes, visit the SLDS website.

Requesting accommodations

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential.

In addition to contacting the instructor, please contact the Office for Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University. Go to http://ods.osu.edu for more information.

Assessment Timetable:

The following table shows the due dates for all the problem sets in this class. The problem sets will be posted on Carmen no later than 5:00 pm on the day indicated below in Table 1 and will be due on the day given in the Table 1. **Solutions will be posted on CARMEN, and no late problem sets will be accepted.** You can only work in a group up to **three people** and submit one copy per group. **Also, please remember that late assignments will not be accepted.**

Table 1: Assessment Timetable

Problem Set	Date Issued (Posted on Carmen)	Due Date (By midnight, ET)
Problem Set 1	September 7th, Thursday	September 14th, Thursday
Problem Set 2	September 21st, Thursday	September 28th, Thursday
MIDTERM EXAMINATION **October 10th, Tuesday – In class, during class time.** Exam will cover **Chapters #1, 2, 3, 4 and 5.** BuckID is required. Remember to have your calculator. Formula sheet will be provided. You will have 1 hour 20 minutes.		

Problem Set 3	October 19th, Thursday	October 26th, Thursday
Problem Set 4	November 14th, Tuesday	November 21st, Tuesday
Optional Problem Set 5	November 28th, Tuesday	December 5th, Tuesday

FINAL EXAMINATION
COMBINED FINAL EXAM FOR ALL SECTIONS
DECEMBER 11th, MONDAY FROM 6:00 PM TO 7:45PM
Dreese Lab 113 and Journalism Bldg. Rm 360
FINAL Exam will cover **Chapters 9,10,11,12 and 13**
BuckID is required. Remember to have your calculator.
Formula sheet will be provided.

Tentative Course Schedule

The following describes the tentative course schedule. The topics covered on each proposed day may change as the semester progresses, but the general order will not vary. Students are strongly urged to read the appropriate chapters BEFORE watching pre-recorded lecture videos. To do well, you **must keep up with the reading and stay focused throughout the semester**. **It is easy to get behind** in the study of derivatives. Therefore, students are REQUIRED to read the appropriate chapters before class. This will help your understanding of the concepts as they are discussed.

It is also students' responsibility to check and follow weekly Carmen Modules as well as Carmen announcements every week**.** If you have any questions, please feel free to reach out to me right away.

The following outline is the order of study (I reserve the right to change this outline when necessary).

Table 2: Tentative Course Schedule

Class Date	Topics, Assignments, and Deadlines	Reading
Week 1 Aug 22nd & Aug 24th	Chapter 1: Introduction to Derivatives **Assignment for this week:** 1. Read the syllabus 2. Read Chapter 1 from our textbook 3. Suggested End of Chapter Questions: 1.3, 1.7, and 1.9	Syllabus & McDonald Ch.1

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Class Date	Topics, Assignments, and Deadlines	Reading
Week 2 Aug 29th & Aug 31st	Chapter 2: Forwards and Options **Assignment for this week:** 1. Read Chapter 2 from our textbook 2. Suggested End of Chapter Questions: 2.5, 2.7, 2.9, 2.12, 2.14	McDonald Ch.2
Week 3 Sept 5th & Sept 7th	Chapter 3: Insurance, Collars, and Other Strategies **Assignment for this week:** 1. Read Chapter 3 from our textbook 2. Suggested End of Chapter Questions 3.1, 3.4, 3.8, 3.11, 3.14, 3.15, 3.16, 3.17, and 3.18	McDonald Ch.3
Week 4 Sept 12th & Sept 14th	Cont'd Chapter 3: Insurance, Collars, and Other Strategies Chapter 4: **Assignment for this week:** 1. Read Chapter 4 from our textbook 2. Work on the worksheet posted on Carmen. 3. <u>Problem Set #1 is due on September 14th, Thursday via Carmen. Due until 11:59 pm.</u>	McDonald Ch. 4
Week 5 Sept 19th & Sept 21st	Con't Chapter 4: 1. Work on the 2nd worksheet posted on Carmen.	McDonald Ch.4
Week 6 Sept 26th & Sept 28th	Chapter 5: Financial Forwards and Futures Assignment for this week: 1. Read Chapter 5 2. Suggested End of Chapter Questions 5.3, 5.4, 5.8, 5.10, 5.13, and 5.19 <u>3. Problem Set #2 is due on September 28th Thursday via Carmen by midnight.</u>	McDonald Ch. 5

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Class Date	Topics, Assignments, and Deadlines	Reading

Week 7
Oct 3rd & Oct 5th
	Chapter 5: Financial Forwards and Futures
	    1. Work on the sample problems in class
	    2. Review for Midterm Examination
		McDonald Ch. 5

Week 8 Oct 10th & Oct 12th	**MIDTERM EXAMINATION** **October 10th, Tuesday – In class, during class time.** **Exam will cover** McDonald Chapters # 1, 2, 3, 4 and 5. Buck ID is required. Remember to have your financial calculator. Formula sheet will be provided. You will have 1 hour 20 minutes to complete the exam. *Oct 12th No Classes – Autumn Break	

Week 9
Oct 17th & Oct 19th
	Chapter 9: Parity and Other Option Relationships
	Assignment for this week:
	    1. Read Chapter 9
	    2. Suggested End of Chapter Questions: 9.1, 9.3, 9.4, 9.6, 9.7a, 9.7b, 9.9, 9.10, 9.11, and 9.15
		McDonald Ch. 9

Week 10
Oct 24th & Oct 26th
	Chapter 10: Binomial Option Pricing: Basic Concepts
	Assignment for this week:
	    1. Read Chapter 10
	    2. Suggested End of Chapter Questions: 10.6, 10.10, 10.12, 10.16, 10.19, 10.21
	    3. Sample Problems for Chapter 10
	    4. <u>Problem Set #3 is due on October 26th, Thursday via Carmen by midnight.</u>
		McDonald Ch. 10

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Class Date	Topics, Assignments, and Deadlines	Reading
Week 11 Oct 31st & Nov 2nd	Chapter 11: Binomial Option Pricing Model- Applications to different types of Asset/ American Options **Assignment for this week:** 1. Read Chapter 11 – Discrete Dividend Case 2. Download slides for Chapter 11 3. Suggested End of Chapter Questions: 11.1, 11.4, 11.8, 11.14, 11.16, and 11.18	McDonald Ch.11
Week 12 Nov 7th & Nov 9th	Cont'd Chapter 11: Binomial Model Chapter 12: The Black-Scholes Formula **Assignment for this week:** 1. Read Chapter 12 2. Download slides for Chapter 12 3. Read Lecture Notes on Black-Scholes Option Pricing Model	McDonald Ch.11 and Ch. 12
Week 13 Nov 14th & Nov 16th	Cont'd Chapter 12: The Black-Scholes Formula and Chapter 12: Option Greeks **Assignment for this week:** 1. Read lecture note on Option Greeks. 2. Download slides from Carmen. 3. Sample Problems on The Black-Scholes Formula 4. Suggested End of Chapter Questions: 12.3, 12.5, 12.9, 12.14, and 12.20.	McDonald Ch.12
Week 14 Nov 21st & Nov 23rd	Con't Chapter 12: Option Greeks **Assignment for this week:** 1. Sample Problem on Option Greeks. 2. <u>Problem Set #4 is due on November 21st, Tuesday via Carmen by midnight.</u> *Nov 23rd No Class – Thanksgiving Break!	McDonald Ch.12

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Class Date	Topics, Assignments, and Deadlines	Reading
Week 15 Nov 28th & Nov 30th	Chapter 13: Market Making and Delta-Hedging 1. Sample Problems on Market Making and Delta Hedging	McDonald Ch.13
Week 16 Dec 5th LAST DAY OF CLASS!	**Complete Chapter 13 and Review for Final Examination!** Assignment: Optional Problem Set #5 is due on December 5th, Tuesday via Carmen by midnight. **FINAL EXAMINATION** **DECEMBER 11th, MONDAY FROM 6:00 PM TO 7:45PM** **Dreese Lab 113 and Journalism Bldg. Rm 360.** **Exam will cover** McDonald Chapters # 9, 10, 11, 12 and 13. Buck ID is required. Remember to have your financial calculator. Formula sheet will be provided during the exam.	

Good Luck!