INSTRUCTOR INFORMATION
Instructor: Javad Rastegari
Office: WSC-Research Unit-186
Office Hours: Monday 1-3 pm. (Changes will be announced on OWL website.)
Email: jrastega@uwo.ca
For privacy reasons and to avoid problems with spam filters, please use your official UWO account for email communications.

COURSE INFORMATION
Lecture Hours: Mondays 9:30-11:30 am (NCB117), Wednesdays 9:30-10:30 am (NCB117).
Course Description: The goal of this course is to introduce people to some basic financial products, their use in hedging and financing, their properties, and valuation. Securities such as bonds, puts and calls and their arbitrage relations will be discussed. Discrete-time stochastic models for securities prices will be introduced. Pricing and hedging (replication) of securities using these discrete-time models will be investigated. Martingales, risk-neutral valuation, and pricing by no-arbitrage will be covered. The Cox-Ross-Rubinstein binomial model and its application to valuation of various types of options will be studied in more details. Black-Scholes option pricing formula and its hedging parameters and basic discrete-time interest rate models will be covered. Note that some of these topics may be omitted and others studied, as time and interests allow.
Prerequisites: Enrollment in a quantitative graduate program at UWO.
Corequisites: None
Antirequisites: None
Pre,Co-requisites Warning: Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. You can be deregistered at any time even after writing the final exam. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the prerequisites.

BOOK INFORMATION
The instructor will use his own set of course notes during lectures. The course content is based on selected material from the following textbooks:

COURSE OBJECTIVES

After completing this course, students will be able to

- understand the properties of financial securities such as call and put options;
- understand uses of these securities in hedging, trading and financing;
- assess the risk/reward of trading strategies;
- identify arbitrage opportunities and construct trading strategies to exploit them;
- replicate the payoff of various securities;
- construct discrete-time stochastic models for securities prices;
- understand properties of discrete-time stochastic processes such as conditional expectation and martingales;
- price securities by risk-neutral valuation and by no-arbitrage;
- dynamically hedge securities using discrete-time models;
- price and hedge equity options using Cox-Ross-Rubinstein binomial model;
- understand the difference between complete and incomplete market models;
- price and hedge equity options using Black-Scholes in a discrete-time framework;
- price exotic options involving various assets and/or path dependency.

ASSESSMENT

Students will be evaluated on the basis of three Assignments, two Term Tests and a Final Exam.

Assignments: Assignments constitute an essential part of the course and may require solving practice problems, learning about more financial instruments and models, and using Excel worksheets and/or codes in MATLAB or Python to apply option pricing models to market data. Weights and due dates are:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weight</th>
<th>Deadline</th>
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<tbody>
<tr>
<td>Assignment 1</td>
<td>15%</td>
<td>Due by Sept. 30, 9:30 am</td>
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<tr>
<td>Assignment 2</td>
<td>15%</td>
<td>Due by Oct. 28, 9:30 am</td>
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<tr>
<td>Assignment 3</td>
<td>20%</td>
<td>Due by Dec. 4, 9:30 am</td>
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Tests and Final Exam: The two Tests, 50 minutes in length, will be held during class time. The Final Exam will be 2.5 hours long with time and location TBA. Details are:

<table>
<thead>
<tr>
<th>Test</th>
<th>Weight</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Test 1</td>
<td>12%</td>
<td>Oct. 16</td>
</tr>
<tr>
<td>Test 2</td>
<td>12%</td>
<td>Nov. 13</td>
</tr>
<tr>
<td>Final</td>
<td>26%</td>
<td>TBD</td>
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</tbody>
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Note: There will NOT be any make-up tests. See “Missed Midterm or Test” on following pages.

Calculator: Any non-programmable calculator may be used for all tests and exams. No other electronic devices such as PDAs, cell phones, etc., will be allowed.

Formula sheet: The main formulas will be given in tests and exams. Students are NOT allowed to use additional formula sheets.
COURSE OWL WEBSITE
The course website on OWL will be used as the primary means for announcement of course-related news. It is the students’ responsibility to regularly check Announcements and Course Information pages on OWL in order to find the latest announcements on lectures, assignments, tests, etc.
Lecture slides will be posted on OWL. However, they will not cover all material discussed during lectures.

COURSE WORK EVALUATION PRIOR TO COURSE DROPPING DEADLINE:
NB: This policy applies to all UWO undergraduate courses, but this will be adopted in this graduate course.
Effective September 2016, a new Senate regulation has come into effect. It states that students must receive an evaluation of course work totalling 15% of their final grade at least one week prior to the deadline for withdrawal without academic penalty. Course work (i.e., assignments and tests) results returned in class or elsewhere will meet this requirement. There is no obligation for an electronic posting on OWL or other site. A student's failure to collect such items does not constitute grounds for any appeal.

DEPARTMENT POLICY ON MISSED COURSE REQUIREMENTS AND STUDENT HEALTH AND WELLNESS
If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to your Dean's office as soon as possible, and contact your instructor immediately. If accommodation is approved by your Dean's office, your instructor will be notified, then it is your responsibility to make alternative arrangements with your instructor. In the event of a missed exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see: http://www.stats.uwo.ca/accommodation_medical.pdf. A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility. The form can be found at: http://www.stats.uwo.ca/medicalform.pdf. Or, request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services.

Missed Midterm or Test: The policy of the department of Statistical and Actuarial Sciences is that there will be no make-up exams for a missed midterm or test. For those that do legitimately miss a test and provide the required supporting documentation, the standard practice will be that the weight of the midterm will be reassigned to the final exam. If your reason is not deemed valid, then you will receive a mark of 0.

Student Health and Wellness: As part of a successful student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western’s Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page http://www.music.uwo.ca/, and our own McIntosh Gallery http://www.mcintoshgallery.ca.
Information regarding health- and wellness-related services available to students may be found at http://www.health.uwo.ca/.

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at http://www.health.uwo.ca/mental_health/resources.html.

To help you learn more about mental health, Western has developed an interactive mental health learning module, found here: http://www.health.uwo.ca/mental_health/module.html. This module is 30 minutes in length and provides participants with a basic understanding of mental health issues and of available campus and community resources. Topics include stress, anxiety, depression, suicide and eating disorders. After successful completion of the module, participants receive a certificate confirming their participation.

**Accessibility:** Please contact the course instructor if you require lecture or printed material in an alternate form at or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.

**Support Services:** Learning-skills counsellors at the Student Development Centre (SDC) (http://www.sdc.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Additional student-run support services are offered by the USC, http://westernusc.ca/services. The website for Registrarial Services is http://www.registrar.uwo.ca.

**ATTENDANCE**

Classroom attendance is viewed as an important part of the learning process. Students are advised that excessive absenteeism may result in the student being disbarred from the final exam (see Western Academic Calendar).

**CLASSROOM ENVIRONMENT**

The Department has adopted a "Mutual Expectations" policy governing the classroom environment and all work submitted by students. The full text of the policy can be found at: http://www.stats.uwo.ca/mutual_expectations.pdf. In summary, the policy was developed under the premise that all interactions between students and faculty should be governed by the principles of courtesy, respect and honesty. Students who are in emotional/mental distress should refer to Mental Health@Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.