

**MATH 440 MATHEMATICAL THEORY OF FINANCIAL ECONOMICS**  
**FALL 2017 (Sept 20-Dec 1)**  
**MTWThF 11 - 11:50am in BOUILLON 210**

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Office Hours: MTWThF 12pm – 12:50pm, and by appointment.

**Text:** McDonald, Derivatives Markets, 3rd edition, Pearson. We'll be covering all or parts of Chapters 9 - 14, 18, 19, 23, and 25. Depending on time, we may skip some sections of these chapters.

**Course Goals:** The student will be able to give various constraints on the prices of options, use the binomial pricing model to price options, price European options using the Black-Scholes formula, apply the lognormal distribution to calculate probabilities for option values, implement the risk-neutral pricing using Monte-Carlo simulation, and apply various interest rate models.

**Prerequisite:** MATH 411B and MATH 418C, or permission.

**Course Assessment:** Your overall grade will be determined by the following:

- Two in-class exams (40% total); tentative dates: Tuesdays, Oct 17 and Nov 14
- Comprehensive final exam (25%); given Thursday, Dec. 7, from 8 - 10am
- Homework (25%)
- Problem session and presentation (10%); see below for more information.

**Required Materials:** The textbook is required. A scientific or graphing calculator is also required. If you are planning to take Exam MFE (see below), some recommended calculators are TI-30Xa, TI-30X II (IIS solar or IIB battery), or TI-30XS MultiView (or XB).

**Exam MFE:** This course covers roughly two-thirds of SOA Exam MFE material. The remaining material was covered in MATH 418C. Exam MFE is offered three times a year (March, July, and November). For more information, see <https://www.soa.org/education/exam-req/edu-exam-mfe-detail.aspx>.

**Homework:** Weekly homework will be assigned in class. Due dates will be announced at the time of the assignment. Homework must be done neatly, stapled, and written on clean-edged paper. Your work should be clear, in a logical order, and provide sufficient explanation. Credit will not be given for late homework. Collaboration on homework is permitted, but copying is not permitted. You must write up every problem on your own, even if you worked with others to figure it out. Credit will not be given to any party for work which is identical.

Smaller homework assignments will also be given from time to time of the form, "Read this section in the book and respond to these questions." These will probably have a much shorter turn-around time than the regular weekly assignments and, in particular, you may be asked to do this before the next class meeting.

**Problem Session and Presentation:** We will have weekly "problem sessions" throughout the quarter, where instead of covering new material in class you will be given several problems to work on. At the end of class, you will be assigned to present or write up solutions to these problems. If time permits, we will have people present their solutions (using the doc cam) sometime in the next couple of class days. These problems must also be written up neatly and given to me either electronically or in a form suitable for scanning by class time on the third class day after the problems are distributed. You are required to present/write-up at least 5 problems over the course of the quarter. When presenting or writing up a problem, remember that it needs to be understandable to your fellow students.

**Exams:** Any changes to the tentative exam schedule will be announced in advance. Make-up arrangements must be made at least one day prior to an exam unless you can document an unexpected circumstance beyond your control that prevented you from taking the exam.

**Other Information:** Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body. If you anticipate or experience any barriers to learning, discuss your concerns with the instructor. Students with disabilities should contact Disability Services to discuss a range of options to removing barriers, including accommodations. Student Disability Services is located in Hogue 126. Call (509) 963-2214 or email [ds@cwu.edu](mailto:ds@cwu.edu) for more information.

I reserve the right to change the policies contained in this syllabus as dictated by developments during the quarter. Changes will be announced in class and on Canvas.