

**Math 418C Spring 2022**  
**Financial Mathematics III**

**Instructor:** Dr. Kathy Temple

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**Office Hours:** MTWTh 10 - 10:50AM, and by appointment. Office hours are available either in-person or over Zoom. *For in-person office hours, a mask is REQUIRED. If you would prefer not to wear a mask, please attend Zoom office hours or schedule a Zoom appointment.*

**Meeting times:** 2 - 2:50PM MTWTh in SAMU 115.

**Course Goals:** Math 418C will cover some of the material on Exam IFM of the Society of Actuaries. In particular, we will talk about an introduction to derivatives, including pricing models, and some additional financial topics. This quarter, we will cover:

- Put-call parity and comparing options;
- Binomial option pricing model;
- Risk-neutral pricing;
- Black-Scholes formula;
- Delta-hedging;
- Exotic options;
- Lognormal stock pricing model.
- Additional financial topics as time permits.

**Prerequisite:** Math 418B and a course that does some probability theory (Math 314 or Math 411B).

**Required Text:** McDonald, *Derivatives Markets*, 3rd edition; we will cover all or parts of chapters 9, 10, 11, 12, 13, 14, and 18. The textbook for this course is being offered as Inclusive Access; this means that you will need to opt-out of the text if you do not wish to purchase it through the Wildcat Shop.

**Evaluation:**

- Two in-class exams (20% each); tentative testing dates: Tuesday, April 26, and Tuesday, May 17.
- Comprehensive final exam (30%); given Wednesday, June 8, from 12-2PM.
- Homework (30%).

Grades will be assigned according to the following scale:

	A	93-100%	A-	90-92.99%	
B+	87-89.99%	B	83-86.99%	B-	80-82.99%
C+	77-79.99%	C	73-76.99%	C-	70-72.99%
D+	67-69.99%	D	63-66.99%	D-	60-62.99%
	F	59.99%			and below

## Course Conduct:

- **Required Materials:** The textbook is required. You will also need at least a scientific calculator. I strongly recommend a financial calculator, in particular either the BAI+ or the BAI+ Professional. I will assume on exams that you have access to such a calculator.
- **Homework:** Homework will be assigned often in class and due dates will be announced at the time of the assignment. Homework must be done neatly and written with reasonable amounts of white space for comments. Your work should be clear, in a logical order, use correct mathematical notation, and follow the guidelines for written work, below. Collaboration on homework is permitted, but **copying is not permitted**. A good rule of thumb is that you should write up a 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. I reserve the right to change this syllabus, including evaluation procedures, if copying becomes a problem. I will also assign smaller homework assignments of the form, “Read this section in the book/study note and respond to these questions.” These will probably have a much shorter turn-around time than the regular homework assignments and, in particular, I may ask you to do this before the next class meeting.
- **Exams:** Any changes to the tentative exam schedule will be announced in advance. Make-up arrangements must be made prior to an exam unless you can document an unexpected circumstance beyond your control that prevented you from taking the exam. All make-up exams must be requested as early as possible. Exams requested more than 24 hours after the scheduled exam will be given only in extreme extenuating circumstances (e.g. hospitalization, jail . . .) When a make-up exam cannot be taken in a timely manner, typically before exams are returned to the class, I reserve the right to instead replace that portion of the course grade with the final exam grade.

**General Course Policies:** Come to class. Do your own work. Work really hard; this class is likely to be quite difficult, but you will leave it with a useful set of skills, and a better understanding of financial mathematics!

**Face Coverings:** Masks are *required* in classroom spaces by CWU policy until at least April 9. If you do not have a face covering Central Washington University can provide one for you. If you have not yet received your CWU-supplied facial covering, please go the SURC Information Desk. Please do so prior to the start of your first class. Face coverings must cover both the mouth and nose, fitting snugly against the sides of the face. Your mask protects me; my mask protects you. Masks with one-way valves for exhalation, single-layer fabric masks, and gaiters don't have the protective value for others - please don't use them as your face covering for any in-person components. Your mask needs to stay on for the entire duration of class, and needs to stay put (no dropping, gapping, or sagging). Because of this, no eating is permitted in class, unless there is an official medical accommodation through Disability Services. Beverages are permitted ONLY if they are consumed using a straw tucked under your mask. Students not wearing a mask or not wearing one correctly will be asked to put one on; if they refuse, students will be asked to leave the classroom and building. Thank you for helping keep all of us safe!

N95/KN95 masks are strongly recommended because they have been found to be more effective against the spread of the Omicron variant than other facial coverings, according to the U.S. Centers for Disease Control and Prevention (CDC).

I am asking that we all wear a mask in class even after it is no longer a university-wide requirement. We don't know all of your medical histories or home/family situations; we don't know who is immune-compromised, who has an immune-compromised family member or one who

is unable to be vaccinated for medical reasons, who lives with children too young to be vaccinated, etc. I want the classroom to be a safe space for everyone - so please mask up, at least for now. Being in a classroom shouldn't be the riskiest thing any of us does!

**COVID Vaccinations and Boosters:** CWU is strongly encouraging all students and employees to receive a COVID19 booster shot if it has been six months since your second Pfizer or Moderna shot, or two months since the single-dose Johnson & Johnson shot. Most pharmacies offer booster shots, and they are also available at Student Health Services.

**Written Work:** All work handed in for the course must be written neatly, legibly, clearly, using correct mathematical notation, and with sufficient explanation. A good rule of thumb is to write your solution so that a classmate who knows roughly what's going on in the course but doesn't know how to do this particular problem can understand your solution. As a side benefit, this makes it much more likely that you will be able to understand your solution when you go back to study for exams! The bottom line: for any written work handed in for the course, including homework and exams, *you must show your work*.

**Late Work:** Homework assignments can be submitted late with a 20% penalty per 24-hour period, up until the time that graded assignments are returned to the rest of the class. Assignments submitted after graded work is returned to the rest of the class will not receive credit, however, the lowest homework score will be dropped. Please note that I tend to grade assignments shortly after they are submitted and almost always within 2 class days.

**Submitting Work Electronically:** All work for this course will be submitted electronically through Canvas.

- Homework assignments can be submitted in .pdf format ONLY.
- We will be using significant mathematical notation in this course, which will make typesetting with correct notation difficult. Therefore, I strongly suggest handwriting most of your homework. You have a few options for submission:
  - You can scan it to a PDF document using a cell phone camera. Some apps that do this (there are many others if you don't like these): Adobe (free) or CamScanner (free version) for Android phones; the Notes App (built-in) or CamScanner (free version) for iPhone.
  - You can take a well-lit, easy-to-read photograph, insert it into a Microsoft Word or OpenOffice Writer document, make sure that the photo is oriented correctly and easy to read, and then save the document as a .pdf file for upload to Canvas.
  - If your work is multiple pages, please upload it as a SINGLE file.

Whichever method you choose, please double-check that your image is oriented correctly. Images not oriented correctly or images that are not easy to read will lead to the assignment being returned without being graded.

**Contingency Planning:** In the event that we are unable to meet in person (this could be due to the university shifting entirely to remote coursework, inclement weather or wildfire smoke closures, or because I need to isolate), this course will convert for the necessary time period to a *synchronous* online course using Zoom. This means that you will be expected to continue attending class at the scheduled times, but we will meet using Zoom rather than in-person. In the event that a period of remote learning includes a course assessment, I may change the format of the assessment if necessary.

**Illness:** If you are feeling unwell for any reason, *please, please, please stay home*. Being vigilant about this will help prevent the spread of COVID-19 (and other bugs!) and allow us to continue in-person classes.

**Academic Honesty:** Consult university policies (CWUP 5-90-040(22), CWUR 2-90-040(22), and WAC 106-125-020) for student conduct, cheating, plagiarism, and other academic expectations. CWU's policies and recommendations for academic misconduct will be followed, leading to disciplinary action up to and including failing the course.

**Inclusivity Statement:** As a member of a peer learning community, a high degree of professionalism is necessary. **CWU expects every member of the university community to contribute to an inclusive and respectful classroom culture.**

**Classroom Conduct:** Students in this class are expected to interact with students and the professor professionally. Instances of disruptive conduct, obstructive conduct, or harassment (see definitions below from the Washington Administrative Code: WAC 106-125-020) will be referred to the Dean of Student Success.

**Disability Support Services:** Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body. Students with disabilities should contact Disability Services to discuss a range of options to removing barriers, including accommodations: Hogue Hall 126, 509.963.2214, DS@cwu.edu

**Is my absence excused?** Excused absences will not lower your overall grade in this class and are determined on a case-by-case basis. Excused absences include illness, bereavement, and school-related activities. With the exception of illness, documentation is required. Excused absences do not include travel for holiday breaks, work, or non-emergency travel delays.

In compliance with RCW 28B.137.010, Central Washington University makes every effort to deal reasonably and fairly with students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Students must present written notice to their instructor within the first two weeks of class listing the specific dates on which accommodations are required. Contact the Dean of Student Success at (509) 963-1515 for further information or questions.

**Communication:** While we all hope for a smooth quarter, we know that best-laid plans can go awry! Some of us may need to quarantine or isolate in the middle of the quarter. We all may need to shift entirely remote on short notice (and it may be worth thinking in advance about how you would make that work, both in terms of technology and in terms of being able to attend class and complete work remotely). In all things, communication is going to be key. If you have something going on, please let me know (no details you don't feel comfortable sharing, of course, just a general heads-up). As things need to change during the quarter, I will do my best to let you know as soon as I can. In all things, please extend grace to me and your classmates, and I will do my best to do the same.

I reserve the right to change the policies contained in this syllabus as dictated by developments during the quarter.