

# Course Syllabus

## CFRM 450/550: Stochastic Calculus

### Course Prerequisites

If you lack permission to sign up, please speak with me. It is HIGHLY recommended that you have taken courses in multivariate calculus, probability, and statistics.

### Course Description

This is an introductory course on stochastic calculus with an emphasis on the tools needed in finance.

### Textbooks

My course notes will serve as the primary text for this course. And up-to-date version of the notes will be posted on the course website.

### Attendance

I encourage you to attend lecture if you are an on-campus student. Attending class helps me get to know you and it gives you the chance to ask me questions.

### Rough outline of the course

- Review of probability
- Information and conditioning
- Brownian motion
- Stochastic Calculus
- Stochastic and Partial Differential Equations (SDEs and PDEs) and their connections
- Stochastic Control (time-permitting)
- Jump Diffusions (time-permitting)

### Grading

Numerical course grades will be based on the following components:

- Homework 30%
- Midterm Exam 30%
- Final Exam 40%

Your final grade will depend on how well you do relative to other students in this and previous courses – not your absolute score (i.e., I will use a grading curve).

### Late homework, expectations on exams, re-grades and missing exams

**Homework:** Homework assignments are your opportunity to learn the material in this course. In order to keep the focus on learning, you will receive full credit for your homework as long as you have completed the assignment, have shown your work, and have turned it in on time. We will provide solutions to homework problems after the due date. I encourage you to take homework seriously; if you do not, you will struggle on the exams.

**Homework Questions** It is your responsibility to make sure you understand homework solutions. If you

have questions about the solutions, *please do not email me or teaching assistant with your question; we will not respond to emails about homework*. Rather, ask your question in class, during office hours, or post your question on the Canvas website under the “Discussions” tab and either I, the TA or another student will respond. If you see a question posted on the discussion forum and you know the answer, please respond. At the end of the quarter, *I will raise the final grade of any student who has made a strong effort to answer questions posted on Canvas*.

**Late Homework policy:** I make sure to always cover the material needed to complete a HW set before I assign it. And I always give you at least one full week to complete the assignments. As such, *late homework will not be accepted unless you have a true medical or family emergency* that would necessitate taking time away from school. Short of having a true medical or family emergency, *please do not send me or the TA e-mails asking for additional HW extensions*.

**Expectations on Exams:** To receive full credit on exam problem, you must (i) have the correct and complete answer in the specified form and (ii) clearly show all of the work necessary to arrive at your answer. A complete answer generally will make use of all of the information given in the problem. For example, if the answer involves taking an expectation, and you can evaluate the expectation explicitly, you should do so. When in doubt, imagine that you are an employee at a company, that your boss has asked you to answer a question and that your answer will determine your end-of-the-year bonus. If another employee (i.e., student) provides a more complete answer than you, this employee will get a higher bonus (i.e., grade).

**Re-grades:** If you ask the TA or me to re-grade your exam, we will take off additional points unless we find that there has been a grading error. Additionally, if we find mistakes on your exam that we did not see initially, we will take off points for this as well. Thus, you should only ask for a re-grade if you are 100% certain that your answer is correct and that you have shown sufficient work to receive full credit.

**Missing the midterm:** If you miss the midterm, the final will be worth 70% of your grade. You will not have a chance to make up the midterm if you miss it.

**Missing the final:** If you miss the final exam you will fail course unless you have a true medical or family emergency. In the case of having a true medical or family emergency, you will receive an incomplete until you have taken a make-up final. Generally, the make-up final will be *more difficult* than the regular final, due to the increased time available for studying.

## Exams dates

See the course website for times and locations.

## Students with Disabilities

In compliance with University of Washington policy and equal access laws, I am available to discuss appropriate academic accommodations that you may require as a student with a disability. Request for academic accommodations need to be made during the first week of the quarter, except for unusual circumstances, so arrangements can be made. Students are encouraged to register with the Disability Services Office for disability verification and for determination of reasonable academic accommodations.

For more information, visit: <http://www.washington.edu/admin/dso/>

## Religious Accommodations

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at

<https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/>.

Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form available at:

<https://registrar.washington.edu/students/religious-accommodations-request/>.