

## Computational Finance (MATH 508)

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<b>Time</b>	Every Thursday, 17:30–20:30 from January 11, 2018 (first class) to April 12, 2018 (last class), except for February 22, 2018 (because of reading week)
<b>Location</b>	CAB 269 at the University of Alberta
<b>Instructor</b>	Christoph Frei, cfrei@ualberta.ca, CAB 621
<b>Contents</b>	<p>Combining computational and numerical methods with financial applications, computational finance has become very important in both academia and practice. A main topic of this course in computational finance will be Monte Carlo methods in financial engineering. After introducing the essentials of stochastics and financial derivatives pricing, we discuss how to generate random variables and simulate stochastic differential equations. We then apply these techniques to portfolio optimization and financial derivatives pricing. The computer applications are based on the software MATLAB, which will be introduced gradually and which students need to learn during the course. MATLAB is frequently used in academia and the financial industry, for example, in almost all investment banks.</p> <p>The course can be chosen as a core course in the graduate programs in mathematical finance and applied mathematics. The different topics make this course suitable and interesting also for students from other areas of mathematics and statistics or other departments, in particular from the School of Business, the Department of Economics and the Department of Computing Science.</p>
<b>Prerequisite</b>	STAT 471 or FIN 654 or ECON 598 or consent of the Department.
<b>Textbook</b>	<p>There is no required textbook, but the main material can be found in</p> <p>Paolo Brandimarte: Numerical Methods in Finance and Economics. A MATLAB-Based Introduction. Second Edition. 2006</p> <p>Relevant are mostly Chapters 2, 4 and 8. An electronic copy is available at the <i>University of Alberta Library</i>, which you can access by using your CCID.</p>
<b>Grading</b>	<p>Assignments: 30%, Midterm exam: 30%, Final exam: 40%</p> <p>As this is an evening class, the final exam takes place in the last regularly scheduled class on April 12, 2018.</p>
<b>Further comments</b>	<p>Please note that this course is scheduled only for every other academic year: in the Winter Term 2018 and then in one of the terms of the academic year 2019/20.</p> <p>If you have any questions, please contact Christoph Frei at cfrei@ualberta.ca.</p>