

Course Programme MVE172 Basic Stochastic Processes and Financial Applications, 7.5 credits, 2nd quarter Fall 2021

Responsible teacher. Patrik Albin, email palbin@chalmers.se

Financial teacher. Simone Calogero, email calogero@chalmers.se

Teaching assistant/exercise teacher. Petar Jovanovski, email petarj@chalmers.se

Course web-page. <https://chalmers.instructure.com/courses/16142>

Responsible university unit. Mathematical Sciences, Chalmers Tvärgata 3.

Literature. Hwei Hsu: *Probability, Random Variables, and Random Processes*, 3rd Ed. 2014 or 4th Ed. 2019. *Schaum's Outlines*, McGraw-Hill. List of Errata for Hsu's book is available from the course web-page. Crasch course hand-out (stencil) on probability theory and math available from the course web-page. Information about exercises on Hsu's book are available from the course web-page. Financial lecture notes authored by Simone Calogero available from course web-page and a financial project in Matlab distributed by Simone Calogero during financial part of course.

Contents of course. Chapter 5, Sections 6.1-6.3B and Chapter 9 in Hsu's book. Financial literature as listed above.

Lectures first half of course: In addition to class room sessions lectures are available at course homepage as pdf-files as well as prerecorded live shows with Patrik. The programme of these lectures is indicated below:

Day	Room	Time	Programme
Wednesday 3 November	KA	3.15-5 PM	Sections 5.1-5.4 in Hsu
Thursday 4 November	KA	8-9.45 AM	Sections 5.1-5.4 in Hsu
Thursday 4 November	KA	10-11.45 AM	Section 5.5 in Hsu
Wednesday 10 November	KA	8-9.45 AM	Spare time
Wednesday 10 November	KA	3.15-5 PM	Section 5.5 in Hsu
Thursday 11 November	KA	8-9.45 AM	Sections 5.6-5.7 in Hsu
Thursday 11 November	KA	10-11.45 AM	Section 5.8 in Hsu
Wednesday 17 November	KA	8-9.45 AM	Spare time
Wednesday 17 November	KA	3.15-5 PM	Section 5.8 in Hsu
Thursday 18 November	KA	8-9.45 AM	Sections 6.1-6.3B in Hsu
Thursday 18 November	KA	10-11.45 AM	Chapter 9 in Hsu
Wednesday 24 November	KA	8-9.45 AM	Spare time
Wednesday 24 November	KA	3.15-5 PM	Chapter 9 in Hsu

If a spare time Wednesday 8-9.45 AM is used students will be notified Thursday eveningish the week before by means of Canvas message.

The second half of the course about financial applications will be a reading project course. More information will follow.

Exercises. The exercise material for the first half of the course is available from the course web-page.

The problems for own work in Hsu's book are discussed during the exercise sessions. The computer problems for own work have solutions on the course web page.

Students are supposed to study solved problems first. Thereafter, ideally, students shall try to work with the problems for own work themselves before going to the exercise sessions and seeing the solutions.

The exercise sessions Thursdays 1.15-5 PM and Fridays 3.15-5 PM are run in parallell (i.e., exactly the same programme is carried out both days), so students need only go to one of these sessions each week.

The programme of the exercises is indicated below:

Day	Room	Time	Programme
Thursday 11 November	KA	1.15-3 PM	Exercise session 1
Friday 12 November	Euler	3.15-5 PM	Exercise session 1
Thursday 18 November	KA	1.15-3 PM	Exercise session 2
Friday 19 November	Euler	3.15-5 PM	Exercise session 2
Thursday 25 November	KA	1.15-3 PM	Exercise session 3
Friday 26 November	Euler	3.15-5 PM	Exercise session 3
Thursday 2 December	KA	1.15-3 PM	Exercise session 4
Friday 3 December	Euler	3.15-5 PM	Exercise session 4

Examination. Written exam (4,5 credits) on first half of course three hours Saturday 4 December 2021 8.30 AM with reexams April 2022 and August 2022.

Financial Matlab project (3 credits) that is reported to Simone Calogero at the end of the course. There will be additional opportunities to report the project (if not passed before) in connection with the written re-exams.

Permitted aids on campus exams are either two A4-sheets (4 pages) of hand-written notes (xerox-copies and computer print-outs are not allowed) or Beta – but not both these aids.

Written exams have 4 tasks with a total 20 possible points - you need 8 points for grade 3, 12 points for grade 4 and 16 points for grade 5.

The financial project only have grades pass and failure and when a pass has been received on both the written exam and the project it is the written exam that determines the final grade on the course.

Digital/self-study moments: Crash course, solved exercises in Hsu book and computational exercises. All other moments in course are also prepared for digital/self-study as movies, notes etc. from last years fully digital course are available from course web-page.

Good Luck Students and Welcome!