

Course Programme MSG800/MVE170 Basic Stochastic Processes, 7.5 credits, 2nd quarter Fall 2014

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Course web-page. <http://www.math.chalmers.se/Stat/Grundutb/GU/MSG800/A14/>

Responsible university unit. Department of Mathematical Statistics, Mathematica Sciences, Chalmers Tvärgata 3. Expedition: Monday - Friday 9 am - 1 pm.

Literature. *Hwei Hsu: Probability, Random Variables, and Random Processes, 2nd Ed. 2010 or 3rd Ed. 2014. Schaum's Outlines, McGraw-Hill and Geoffrey Grimmett and David Stirzaker: Probability and Random Processes, 3rd Ed. 2001. Oxford University Press* are available from Cremona Chalmer's bookshop. Additional computer exercises are available from the course web-page.

While the book by Hsu is intended as a "learning book" the book by Grimmett and Stirzaker is more suitable as a reference book. It is therefore not only useful for learning Markov chains (as we use it to), but also for supplementary reading and reference purposes.

The book *Geoffrey Grimmett and David Stirzaker: One Thousand Exercises in Probability. Oxford University Press 2001* (also available from Cremona) contains solutions to the exercises in *Probability and Random Processes* and can thus be used for supplementary reading. However, the solutions that concern us occupy just 26 pages (13 sheets) in this book of its total 438 pages.

Contents of course. Chapter 5, Sections 6.1-6.5 and Chapter 9 in Hsu's book. Sections 6.1-6.5, 6.8-6.9 and 6.11 in the book by Grimmett and Stirzaker.

Prerequisites for the course (besides basic university level math) is basic probability theory from a first university level course in mathematical statistics.

Lectures. The course has 21 lectures according to the schedule below. (The indicated content of lectures is approximative/preliminary.)

Lectures	Day	Time and place	Programme
Lecture 1	Wednesday 5 November	3.15-5 pm in HC3	Ch. 5 in Hsu's book
Lecture 2	Thursday 6 November	8-9.45 am in HB1	Ch. 5 in Hsu's book (cont.)
Lecture 3	Thursday 6 November	10-11.45 am in HA2	Ch. 5 in Hsu's book (cont.)
Lecture 4	Wednesday 12 November	8-9.45 am in HC1	Ch. 5 in Hsu's book (cont.)
Lecture 5	Wednesday 12 November	3.15-5 pm in HC3	Ch. 5 in Hsu's book (cont.)
Lecture 6	Thursday 13 November	10-11.45 am in HA4	Ch. 6 in G-S's book
Lecture 7	Wednesday 19 November	8-9.45 am in HC1	Ch. 6 in G-S's book (cont.)
Lecture 8	Wednesday 19 November	3.15-5 pm in HC3	Ch. 6 in G-S's book (cont.)
Lecture 9	Thursday 20 November	10-11.45 am in HA4	Ch. 6 in G-S's book (cont.)
Lecture 10	Wednesday 26 November	8-9.45 am in HC1	Ch. 6 in Hsu's book
Lecture 11	Wednesday 26 November	3.15-5 pm in HC3	Ch. 6 in Hsu's book (cont.)
Lecture 12	Thursday 27 November	10-11.45 am in HB4	Ch. 6 in Hsu's book (cont.)
Lecture 13	Wednesday 3 December	8-9.45 am in HC1	Ch. 9 in Hsu's book
Lecture 14	Wednesday 3 December	3.15-5 pm in HC3	Ch. 9 in Hsu's book (cont.)
Lecture 15	Thursday 4 December	10-11.45 am in HA4	Ch. 6 in G-S's book (cont.)
Lecture 16	Wednesday 10 December	8-9.45 am in HB3	Ch. 6 in G-S's book (cont.)
Lecture 17	Wednesday 10 December	3.15-5 pm in HC3	Ch. 6 in G-S's book (cont.)
Lecture 18	Thursday 11 December	10-11.45 am in HA2	Ch. 6 in G-S's book (cont.)
Lecture 19	Wednesday 17 December	8-9.45 am in HC1	Ch. 6 in G-S's book (cont.)
Lecture 20	Wednesday 17 December	3.15-5 pm in HC3	Ch. 6 in G-S's book (cont.)
Lecture 21	Thursday 18 December	10-11.45 am in HA4	Spare

Exercise sessions. The course has 7 exercise sessions according to the schedule below.

Exercise Session	Day	Time and place
Exercise Session 1	Wednesday 5 November	8 - 9.45 am in HC1
Exercise Session 2	Thursday 13 November	8 - 9.45 am in HB3
Exercise Session 3	Thursday 20 November	8 - 9.45 am in HB3
Exercise Session 4	Thursday 27 November	8 - 9.45 am in HB3
Exercise Session 5	Thursday 4 December	8 - 9.45 am in HB3
Exercise Session 6	Thursday 11 December	8 - 9.45 am in HB3
Exercise Session 7	Thursday 18 December	8 - 9.45 am in HB3

The exercises sessions are available from the course web-page

<http://www.math.chalmers.se/Stat/Grundutb/GU/MSG800/A14/Exercises/Exercises.html>

Exercise session 1 differs from the other sessions in that it is not really a set of exercises but instead a crash course in probability theory and some useful facts from math that experience has shown that many students appreciate being informed about.

At exercise sessions 2-7 the supplementary problems for own work, the computer problems for own work and archetypical type-problems of typical type-exam-type for own work are solved. The students are supposed to study the 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.

Consultation sessions. In addition to the lectures and exercise sessions we arrange a total of 8 consultation sessions in Room Euler Mondays 3.15-5 pm study week 2-8 (= 10, 17 and 24 November and 1, 8 and 15 December 2014 and 5 January 2015) and Friday 3.15-5 pm study week 8 (= 9 January 2015) during which a teacher (or two) is (/are) available to answer questions from students. The teacher(s) in turn is Claes Andersson on the first 6 sessions, Patrik och the 7'th and both Claes and Patrik on the final 8'th one.

Examination. Written exam 4 hours pm Monday 12 Jan 2015, with reexams pm Wednesday 15 April 2015 and pm Friday 28 August 2015. Permitted aids on the written exam 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. The written exams have 6 tasks - you need a 40% score for grade 3/G, a 60% score for grade 4, a 70% score for grade VG and an 80% score for grade 5, respectively.