Course Programme MVE135 Random Processes and Applications, 7.5 credits, 1st quarter Fall 2010

Teachers: Patrik Albin (lectures on book by Miller and Childers, see below),
email palbin@chalmers.se, tel. 31 772 3512.

Mats Viberg (lectures on complementary lecture notes, see below),
email viberg@chalmers.se, tel. 31 772 1773.

Mohsen Nosratinia (consultations Mondays and exercises (advicing) Thursdays),
email nosratin@chalmers.se, tel. 31 772 1845.

Course web-page: http://www.math.chalmers.se/Stat/Grundutb/CTH/mve135/1011/

Responsible university unit: Department of Mathematical Statistics, Mathematica Sciences, Chalmers Tvärgata 3. Expedition: Monday-Friday 8.30 am - 1 pm.

Literature. *S.L. Miller and D.G. Childers: Probability and Random Processes With Application to Signal Processing and Communications, 2004*, available from Cremona Chalmer's bookshop as well as electronically from Chalmers Library. Lecture notes "Complement on Digital Spectral Analysis and Optimal Filtering: Theory and Exercises" authored by Mats Viberg, available through the course web-page. Two laborations available through the course web-page.

Included material from the book by Miller and Childers: Sections 2.1-2.7, 2.8 (self-studies), 3.1-3.3, 3.4.1-3.4.5, 3.4.7, 3.5, 4.1-4.6, 4.11 (self-studies), 5.1-5.8, 5.9.1, 5.9.3, Chapter 6 (mainly self-studies), 7.1.1-7.1.2 (self-studies), 7.2-7.4, 7.6, 8.1-8.6, Chapter 10, Chapter 11.

Examination. Written exam (6 credits) 21 October pm in V, with reexams 10 January 2011 am in V as well as 15 August 2011 am in V. Two mandatory laborations (1.5 credits), see the course web-page.

One of the questions on the written exam will be a somewhat modified version of one of the home problems 3.5, 3.9 or 3.14. The tutor will offer help with these problems during the consultations weeks 2 and 3 (i.e., September 6 and 13). Another questions on the written exam will be a somewhat modified version of one of the home problems 5.5, 5.29 or 5.32. The tutor will offer help with these problems during the consultation weeks 3 and 4 (i.e., September 13 and 20).

Old written exams are available through the course web-page. But note that homeworks (which do no longer feature in the course) do no longer give bonus on the written exam.

Lectures take place in room HC1 according to the following schedule

Lectures	Day	Time	Programme
Lecture 1	Wednesday 1 September	8-9.45 am	Ch. 2 in Miller and Childers
Lecture 2	Thursday 2 September	10-11.45 am	Ch. 3 in Miller and Childers
Lecture 3	Monday 6 September	1.15-3 pm	Ch. 4 in Miller and Childers
Lecture 4	Thursday 9 September	10-11.45 am	Ch. 5 in Miller and Childers
Lecture 5	Monday 13 September	1.15-3 pm	Ch. 5 in Miller and Childers
Lecture 6	Thursday 16 September	10-11.45 am	Ch. 6 in Miller and Childers
Lecture 7	Friday 17 September	3.15-5 pm	Ch. 7 in Miller and Childers
Lecture 8	Monday 20 September	1.15-3 pm	Ch. 8 in Miller and Childers
Lecture 9	Thursday 23 September	10-11.45 am	Ch. 8 in Miller and Childers
Lecture 10	Monday 27 September	1.15-3 pm	Ch. 8 in Miller and Childers
Lecture 11	Thursday 30 September	10-11.45 am	Ch. 10 in Miller and Childers
Lecture 12	Friday 1 October	3.15-5 pm	Ch. 11 in Miller and Childers
Lecture 13	Monday 4 October	1.15-3 pm	Ch. 11 in Miller and Childers
Lecture 14	Thursday 7 October	10-11.45 am	Lecture notes
Lecture 15	Friday 8 October	3.15-5 pm	Lecture notes
Lecture 16	Monday 11 October	1.15-3 pm	Lecture notes

Exercises take place in room EA Thursdays 8-9.45 am starting Thursday 2 September according to the following schedule:

Exercises	**Day**	**Programme**
Exercise 1	Thursday 2 September	Ex. 2.3, 2.6 , 2.10, 2.11, 2.16, 2.26, 2.29, 2.30 in M&C
Exercise 2	Thursday 9 September	Ex. 3.3, 3.4, 3.7, 3.10, 3.16, 3.17 in M&C
Exercise 3	Thursday 16 September	Ex. 4.13, 4.15, 4.20, 4.22, 4.31, 5.22, 5.28 in M&C
Exercise 4	Thursday 23 September	Ex. 6.10, 7.3, 7.8, 7.11, 7.14 in M&C
Exercise 5	Thursday 30 September	Ex. 8.5, 8.7, 8.11, 8.14, 8.22, 8.23, 8.27 in M&C
Exercise 6	Thursday 7 October	Ex. 10.8, 10.12, 10.14, 10.19, 11.11 in M&C
Exercise 7	Thursday 14 October	Ex. 11.14, 11.26 in M&C, Ex. 1, 4, 6 in LN

Home problems. In addition to the problems that are solved by the tutor during the exercise sessions on Thursdays, students must work themselves solving problems from the course literature. Here is a list of problems that are recommended for home work:

Chapters	**Week**	**Problems**
Chapter 2	1	Ex. 2.8, 2.12, 2.19, 2.22, 2,25, 2.32 in M&C
Chapter 3	2	Ex. 3.5, 3.9, 3.14, 3.19 in M&C
Chapter 4	3	Ex. 4.3, 4.4, 4.17, 4.23, 4.28, 4.36 in M&C
Chapter 5	3	Ex. 5.5, 5.29, 5.32 in M&C
Chapter 6	4	Ex. 6.3, 6.12, 6.14, 6.17 in M&C
Chapter 7	4	Ex. 7.4, 7.5, 7.6, 7.9a, 7.16, 7.17 in M&C
Chapter 8	5	Ex. 8.8, 8.9, 8.12, 8.19, 8.25, 8.28 in M&C
Chapter 10	6	Ex. 10.5, 10.7, 10.10, 10.17, 10.20 in M&C
Chapter 11	7	Ex. 11.1, 11.5, 11.12, 11.14, 11.17, 11.20 in M&C
Lecture Notes	7	Ex. 2, 3, 5, 7, 8, 9 in LN

Consultations take place in room EE Mondays 3.15-5 pm starting Monday 6 September. At the consultations students can get help with the laborations and home problems as well as with other course topics.

The tutor will offer help with the home problems 3.5, 3.9 and 3.14, one of which will appear on the written exam in a somewhat modified version during the consultations weeks 2 and 3 (i.e., September 6 and 13).

The tutor will offer help with the home problems 5.5, 5.29 and 5.32, one of which will appear on the written exam in a somewhat modified version during the consultations weeks 3 and 4 (i.e., September 13 and 20).