STOCKHOLM UNIVERSITY DEPARTMENT OF STATISTICS HT-2012

PROBABILITY THEORY, ST701A, ADVANCED LEVEL, 7.5 ECTS CREDITS TEACHING PLAN

Home page

Home page of the course is at http://gauss.stat.su.se/master/slht.shtml and it will be updated regularly. Additional information about the Department of Statistics can be found at http://www.statistics.su.se/

Teacher (lectures and computer exercises)

Andriy Andreev, B:739, tel. 08-16 29 71, e-mail: andriy.andreev@stat.su.se.

Student councellor

Patrik Zetterberg, B:780 at the building B, floor7. Tel. 08-16 29 80, e-mail:patrik.zetterberg@stat.su.se

Lectures, theoretical and computer exercises

See the last page for the schedule.

Computer exercises: One computer laboratory meeting is planned for the course. The main goal is to give students basic knowledge on how to use the Statistics Toolbox of Matlab. The toolbox provides a comprehensive set of techniques to assess and understand data, and offers a rich set of statistical plot types and interactive graphics. All toolbox functions are written in the open Matlab language so that you can check the algorithms, modify the source code, and create your own custom functions.

It is recommended that all the students participate in the computer exercises at the scheduled time.

Literature

Casella G. & Berger R. L. *Statistical Inference*. Second Edition, Duxbury Press (Thomson Learning Academic Resource Center), 2007

Written exams:

- ✓ Friday, 18th of January, 2013. Time: 9[∞] 14[∞]. Place: Värtasalen
- ✓ Friday, 8th of February, 2013. Time: $9^{\circ\circ} 14^{\circ\circ}$. Place: Brunnsvikssalen

Allowed Aids for the Exams

Table of common distributions from Casella & Berger, p. 620-627 (will be attached), calculator, dictionaries for translation and A5 hand-written (both sides) paper with no solutions or proofs. Important: A5 will be (if any) designed and agreed on during the classes.

Schedule of what will be covered on which classes, including lists of problems

Week/Date	Time/Place	Торіс	Readin g	Assignment
W45 (09/11): LI	12.00-15.00 E339	Basics of probability theory: the Kol- mogorov axioms, counting probability, conditional probability and independent events, random variables and distribution functions.	1.1-1.4	1.4, 1.7, 1.12, 1.18, 1.29, 1.30, 1.34, 1.39, 1.44
W46 (13/11): L2	08.00-11.00 F331	Random variables and distribution functions (cont), density and mass functions.	1.3-1.6	1.47, 1.51, 1.53, 1.54
W46 (15/11): L3	08.00-11.00 E339	Functions of a random variable, expected values, variances, moments and moment generating functions.	2.1-2.3	2.2, 2.3, 2.8, 2.11, 2.14(a), 2.23, 2.24, 2.19, 2.30, 2.33, 2.36, 2.39
W46 (16/11): L4	13.00-16.00 F231	Exponential families, location and scale families.	3.3-3.5	3.3, 3.8, 3.9, 3.13, 3.28, 3.33(i), 3.40
W47 (22/11): L5	15.00-18.00 E379	Joint and marginal distributions, con- ditional distributions and indepen- dence.	4.1-4.2	4.1, 4.5, 4.10,
W48 (26/11): L6	09.00-12.00 E347	Bivariate transformations and hierarchical models.	4.3-4.4	4.15, 4.16(a) 4.19, 4.20, 4.27
W48 (28/11): L7	12.00-15.00 F331	Hierarchical models (cont.) and mix- ture distributions.	4.3-4.4	4.31, 4.32(b), 4.34(a)
W49 (5/12): L8	09.00-12.00 F331	Covariance and correlation. Multiple random variables and multivariate distributions. Inequalities.	4.5, 4.7	4.30, 4.55, 4.63
W50 (11/12): L9	09.00-12.00 F331	A random sample and its properties. Sums of random variables from a random sample.	5.1-5.2	
W51 (17/12): L1O	13.00-16.00 F331	Sampling from the normal distribu- tion. Various types of convergence. Central limit theorem.	5.3, 5.5	5.17, 5.18, 5.29, 5.30, 5.31, 5.34
W47 (23/11): C1	09.00-12.00 B3l9	Exploring probability distributions with Matlab.	1.5, 2.1, 3.2-3.3	See prep ex for Lab 1
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In the following L and C stand for Lectures and theoretical exercises and Computer laborations, respectively.