ECON 4130: Statistics 2, Autumn 2007

Contact information

Lecturer

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Course information and documents will be posted on the course web site. You should check it for handouts you missed and any changes to the schedule. I will have regular office hours on Thursdays between **4-6PM (in rm 1125 ES)**. I will also be available by appointment. I would be happy to discuss the course, your progress, or any other issues of concern to you on an individual basis. Please call or email me for an appointment. Also, please contact me if you feel you are having problems participating in class for any reason and we can design a solution together.

Location and hours

See the course webpage for time and location for lectures and seminars.

Textbook

Mathematical statistics and data analysis (3rd edition) by John Rice.

Portfolio assessment

There will be a portfolio assessment which contains three written home assignments with use of statistical software. The schedule for submitting assignments is given below. All three papers must be submitted and approved to obtain an approved portfolio assessment. Students who already obtained an approved portfolio assessment earlier (2003-04-05-06) for this course are not permitted to submit again.

Assignment Number	Date of announcement	Date of submission
1	September 3, 2007	September 10, 2007
2	October 8, 2007	October 22, 2007
3	October 29, 2007	November 5, 2007

Exam

The exam will be an open-book written exam (3-hour long) covering all the material in the course. Students are not allowed to present themselves to the written school exam if the compulsory portfolio assessment is not accepted.

Stata tutorial

Though the emphasis will be on theoretical constructs, some computing will be required to analyze data. Computing will be done in STATA. An introductory course will be organized in week 38 and week 39. Students will be divided into two groups for the training. The instruction will be posted on the course web page during the lecture week 37. The instruction should be downloaded and printed before coming to the PC-room. For more detailed information on location and hours of the stata tutorial, please see the course web page.

Course plan

A tentative plan for the course is given below. It will be updated as the course progresses. On some topics, supplementary materials will be provided on the course web page when needed.

Textbook: Mathematical Statistics and Data Analysis (3rd Edition), by John Rice.

Week	Book sections In Rice	Topics	Seminar
34 Aug	2.2 and	Review, discrete/continuous pdf, cdf Uniform, normal, exponential distribution, poisson events.	
35	2.2, 2.3	Gamma distribution, inverse functions, transformed random variables (rv's).	
36 Sept.	2.3, 3.3	simulation of continuous rv's. joint and marginal distributions. **Written paper I announced on Monday 3/9**	Rice Chapter 2: 33, 36, 40, 41, 49, 53, 60, 61.
37	3.3, 3.4, 3.5, 3.6.1, 4.1	Joint and marginal distributions, Independence, Conditional distribution, and convolution (in 3.6.1), Expectation. **Written paper I handed in Monday 10/9 (in Eilert Sundts 1240)**	Rice Chapter 2: 52a, 65. 52a, 55, 65, 67, 71.
38	4.1, 4.2, 4.4 (4.3 read yourself)	Expectation, variance for continuous distr., conditional expectations. (Covariance, correlation in 4.3 read yourself). Joint and conditional normality, prediction.	Rice Chapter 3: 7, 8, 9, 12, 14, 63a,b.
39	4.5 , 4.2 (Th. C), 4.6, chapter 5, Lecture notes to Rice	Moment generating functions (mgf),Taylor approximation, limit theorems, Chebyshev's inequality, weak law of large numbers	Rice Chapter 4: 6a,b,c; 8 (first part only), 12, 14, 25.

	chapter 5		
40 Oct	(Read 8.1-8.3 yourself) 8.4, 8.5	Slutsky's lemma. Estimation: Moment method (MME), and maximum likelihood method (MLE) **Written paper II announced on Monday 8/10**	Rice Chapter 4: 34, 47, 55, 77a,b, 81.
41	8.5,	More on MLE.	The problem set is announced, please check the web site.
42	----------	NO TEACHING	NO SEMINARS
43	8.5, 8.7, 8.8	Efficiency, Cramer-Rao bounds, parametric bootstrap **Written paper II handed in Monday 22/10 (in Eilert Sundts 1240)**	The problem set is announced, please check the web site.
44	8.5.1, 8.5.2,	Multinomial models, Sufficient statistics. **Written paper III announced on Monday 29/10**	The problem set is announced, please check the web site.
45 Nov	Rice 9.1, 9.2	Hypotheses testing, Neyman Pearson lemma, Uniformly most powerful test **Written paper III handed in Monday 5/11 (in Eilert Sundts 1240)**	The problem set is announced, please check the web site.
46	Rice 9.4, Examples from 9.5	Likelihood ratio testing	The problem set is announced, please check the web site.
47		Discussion	

Detailed reading plan

Rice

Chapter 2

Read all

Chapter 3

Section 3.1, 3.2 : read all

Section 3.3: Skip Example E. Read the rest.

Section 3.4: Skip Example E. Read the rest.

Section 3.5: Skip Example B,D,E in section 3.5.2. Otherwise read the rest.

Section 3.6: Subsection 3.6.1. – Read upto Example A.

Subsection 3.6.2. – Skip Example A, C. Read the rest.

Section 3.7: Skip.

Chapter 4

Section 4.1: read all

Section 4.1.1: Skip Example A. Read the rest.

Section 4.1.2: Read Theorem A and Example E. Skip the rest.

Section 4.2: Read all.

Section 4.2.1: Read all (yourself).

Section 4.3: Read all (yourself).

Section 4.4: Read all.

Section 4.5: Read all.

Section 4.6: Skip.

Chapter 5

Read all.

Supplementary reading: Lecture notes to Chapter 5.

Chapter 8

Section 8.1-8.3: Read yourself.

Section 8.4: Read all except Example D.

Section 8.5: Read all except Example D.

Section 8.5.1: Read all.

Section 8.5.2: Skip the proofs of Lemma A and Theorem B. Otherwise read all (including the statements of the lemma as well as the theorems).

Section 8.5.3: Read all. I will provide you with a handout on *t*-distribution, Chi-square distribution and *F*-distribution in week 45. It will be easier to go through Example A once you get yourself familiar yourself with properties of these distributions.

Section 8.6: Can be skipped.

Section 8.7: Read all except Example A.

Section 8.7.1: Can be skipped.

Section 8.8, 8.8.1, 8.8.2: Read all.

Section 8.9: Read all.

Supplementary reading: Lecture notes to Chapter 8.

Chapter 9

Section 9.1: Read yourself.

Section 9.2, 9.2.1, 9.2.2, 9.2.3: Read all

Section 9.3: Skip

Section 9.4: Read all.

Section 9.5: Read example A and C, only the part where the likelihood ratio test statistic is calculated. You can skip the calculation of Pearson Chi-square test statistics.

The rest of Chapter 9 are skipped.

- Updated for the week 47.

I will update this reading plan every week. Please check the web site periodically.