

# STUDYGUIDE 2006/2007 for PROBABILITY AND STATISTICS (2DI50)

## Teachers

- C. Giardinà, O. Wittich and F. Nardi.

## Lectures

- The lectures will be given in Block C and Block D on Friday-morning from 08.45h-10.30h in Auditorium 7. So two lecture hours each week. The lecturer will be C. Giardinà. See also OWINFO.

## Instructions

- There will be instructions on Friday-afternoon (from 13.30 until 15.15) in Auditorium 16, BUT NOT EVERY WEEK.  
The instructions are on 8 Dec, 22 Dec, 12 Jan, 9 Feb, 2 Mar, 16 Mar (In the other weeks there will be instructions from 2IJ65).  
The teachers for the instruction are O. Wittich and F. Nardi. See also OWINFO.
- Exam: See OWINFO.

## Study material

- D.C.Montgomery, G.C.Runger, Applied Statistics and Probability for Engineers, 4th ed., Wiley. ISBN 0-471-74589-8  
Remark: The third edition can also be used. In the folder Announcements two files are given: The conversion of the table of contents and the conversion of the numbers of the exercises from the third edition to the fourth edition. However, we advice to make a copy of the exercises of Edition 4. The answers of the exercises of the fourth edition will be given in Studyweb.
- Statistisch Compendium, dikt.nr. 2218.

## Necessary knowledge

Calculus, set theory and logic.

## Addresses teachers

Teacher	Address	Telephone	E-mail
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F. Nardi	HG 10.19	4232	f.r.nardi@tue.nl

## Exam

- For the exam one needs to know Chapters 1, 2, 3, 4 (except § 4-11), from Chapter 5: § 5-1.1, § 5-1.2, § 5-1.3, § 5-1.4, § 5-3 and § 5-5; remark: § 5-2 is not part of the exam but very useful; from Chapter 6: § 6-1; Chapter 7 (except § 7-4); Chapter 8 (except § 8-7).
- There is a written exam of 3 hours. The exam consists of 20 questions. It is allowed to use the Statistisch Compendium and a (graphical) pocket calculator.  
Date: see OWINFO

## Studyweb

In Outlook in the folder

Public Folders/All Public Folders/Studyweb/2006-2007/W & I/2DI50/Probability and Statistics

is a.o. available this studyguide, a folder 'Answers exercises Montgomery', a folder with 'Exam exercises', answers these exercises and the sheets from the lectures.

**Remark:** You have only access to these folders if you register yourself for this course using <http://studyweb.tue.nl>

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## SCHEDULE OF THE LECTURES

Week 1 (1 Dec)	Chapter 1 §2-1 – §2-4	The role of Probability and Statistics. Sample space, events, axioms of probability, addition rules, conditional probability.
Week 2 (8 Dec)	§2-5 – §2-8 §3-1 – §3-3	Multiplication and total probability rules, independence, Bayes' Theorem, random variables. Discrete random variables, probability distribution, probability (mass) function, cumulative distribution function.
Week 3 (15 Dec)	§3-4 – §3-9	Mean and variance of a discrete random variable, some discrete distributions: uniform, binomial, Poisson; use of tables.
Week 4 (22 Dec)	§4-1 – §4-6	Continuous random variables, probability distribution, probability (density) function, cumulative distribution function, mean and variance, uniform distribution, normal distribution, standardizing a normal random variable.
Week 5 (12 Jan)	§4-7 – §4-10	Normal approximation to the binomial and Poisson distribution. Exponential distribution and Poisson-process, Erlang distribution, Weibull-distribution.
Week 6 (9 Feb)	§5-1	Joint probability distributions, marginal distribution, conditional distribution, independence.
Week 7 (16 Feb)	§5-3, §5-5, §6-1	Covariance and correlation, linear combination of random variables. Numerical summaries of data.
Week 8 (2 Mar)	§7-1, §7-2, §7-3	Random samples, sampling distributions, Central Limit Theorem, statistical inference, properties of estimators.
Week 9 (9 Mar)	§8-1 – §8-3	Confidence interval for the mean of a normal distribution (variance known and variance unknown), choice of sample size.
Week 10 (16 Mar)	§8-4 – §8-6	General definition of confidence intervals. Confidence interval for variance, confidence interval for a population proportion.

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## Exercises

In the next table Examexer-1 means exercise 1 from the file Examexer.pdf in the folder 'Exam exercises' in Studyweb. In this table Chapx refers to the exercises of Montgomery. **Extra** are just some more exercises if you want some more exercises. It is more of the same. The numbers of the exercises refer to EDITION 4.

Chapter 2	<b>Chap2:</b> 5, 22, 33, 35, 58, 62, 67, 69, 75, 91, 115, 118, 124, 125, 133, 146, 149. Examexer-1b, Examexer-2ac, Examexer-3a <b>Extra: Chap2:</b> 23, 54, 71, 78, 79, 95, 120, 148.
Chapter 3	<b>Chap3:</b> 1 t/m 6, 14, 26, 28, 39, 40, 47, 53, 58, 65, 80, 81, 87, 102, 107, 114, 115, 150. Examexer-1a. <b>Extra: Chap3:</b> 7 t/m 11, 17, 24, 30, 43, 54, 120, 108, 116, 152.
Chapter 4	<b>Chap4:</b> 1, 3, 8, 12, 15, 20, 27, 31, 32, 37, 44, 45, 46, 54, 55, 63, 65, 71, 72, 74, 79, 81, 85, 155. Examexer-3b, Examexer-4, Examexer-5, Examexer-7. <b>Extra: Chap4:</b> 9, 16, 22, 62, 76, 80, 83, 97, 100, 111, 124, 131.
Chapter 5	<b>H5:</b> 1, 2, 5, 8, (17, 24, 25, 35: these exercises between brackets from §5-2 are NOT part of the exam), 33, 35, 43, 57, 60, 62, 64. Examexer-6, Examexer-8. <b>Extra: Chap5:</b> 3.
Chapter 6	<b>Chap6:</b> 1, 2, 13.
Chapter 7	<b>Chap7:</b> 2, 9, 10, 16, 17, 21, 36 (this exercise can be done despite the fact that 7-4 is not part of the exam). Examexer-9, Examexer-10. <b>Extra: Chap7:</b> 14, 19
Chapter 8	<b>Chap8</b> 4, 5, 7, 12, 15, 22, 24, 33, 38, 40, 52, 53. Examexer-11, Examexer-12. <b>Extra: Chap8</b> 1, 3, 9, 18, 20, 23, 34, 38, 47, 55, 60.