

Math 5651

Basic Theory of Probability and Statistics, Spring 2024 (Section 1)

### SYLLABUS

Time and Place: 10:10 am - 12:05 pm TTh (01/16/24 - 04/25/24) M-C Biology 2-122  
Text: M. H. DeGroot, M. J. Schervish. Probability and Statistics.  
2012 Addison-Wesley, Fourth Edition.  
Instructor: Sergey G. Bobkov (Vincent Hall 228, bobkov@math.umn.edu)  
Teaching Assistant: Zhengyi Gong (Vincent Hall 454, gongx300@umn.edu)  
Office hours: 8:20 am - 9:50 am TTh (with TA in Vincent Hall 454)

#### 5651. Basic Theory of Probability and Statistics.

Elementary Probability: Basic concepts, classical probability, combinatorial methods, conditional probability, independent events, Bayes' theorem. Random variables: distribution, expectation, moments, variance, moment generating function. Random vectors: marginal distribution, functions of random variables. Special distributions. Poisson approximation. The law of large numbers. The central limit theorem.

WEEK	DATES	MATERIAL (preliminary distribution)
1	01-16 to 01-18	Introductory remarks, sections 1.4, 1.5
2	01-23 to 01-25	1.6, 1.7, 1.8
3	01-30 to 02-01	1.9, 1.10, 2.1
4	02-06 to 02-08	2.2, 2.3, 3.1
5	02-13 to 02-15	3.2, 3.3, 3.4, 3.5
6	02-20 to 02-22	3.6, 3.7, 3.8, 3.9
7	02-27 to 02-29	Tuesday: Test 1; 4.1, 4.2
8	03-05 to 03-07	Spring break
9	03-12 to 03-14	4.3, 4.4, 4.5
10	03-19 to 03-21	4.6, 4.7, 5.2
11	03-26 to 03-28	5.3, 5.4, 5.5
12	04-02 to 04-04	Tuesday: Test 2; 5.6, 5.7
13	04-09 to 04-11	5.8, 5.9, 5.10
14	04-16 to 04-18	6.2, 6.3
15	04-23 to 04-25	Review; Thursday: Test 3

**Tests:** Tuesday, February 27, 2024  
Tuesday, April 2, 2024  
Thursday, April 25, 2024

**Homeworks:** You will have 5 homeworks due on February 1, 20,  
March 14, 28, and April 18, 2024

**Composition of grade:** Tests – 60%, homeworks – 40% (counting 4 best out of 5).  
Every test is graded in the range of 20 points.  
Every homework is graded in the range of 10 points.

## Homework Assignments Spring 2024

1	Due on February 1	Section 1.4 Section 1.5 Section 1.6 Section 1.7 Section 1.8 Section 1.9 Section 1.10	7 3, 4 1, 6 5, 7 4 7 1, 5
2	Due on February 20	Section 2.1 Section 2.2 Section 2.3 Section 2.5 Section 3.1 Section 3.2 Section 3.3 Section 3.4	6 9, 12 5 3 2, 4 4 4, 6 4
3	Due on March 14	Section 3.5 Section 3.6 Section 3.7 Section 3.8 Section 3.9 Section 4.1 Section 4.2 Section 4.3 Section 4.4	3, 10 3, 6 1 4, 8 4 3, 8 3 7 3, 8
4	Due on March 28	Section 4.5 Section 4.6 Section 4.7 Section 4.9 Section 5.2 Section 5.3 Section 5.4	2, 3 12, 13 2, 7 4 6, 8 4 8, 14
5	Due on April 18	Section 5.5 Section 5.6 Section 5.7 Section 5.8 Section 5.9 Section 6.2 Section 6.3	2, 6 2, 11 2, 3, 4 5 6 6 2