

**INTRODUCTION TO PROBABILITY THEORY**

Math/Stat 414.1

**Instructor:** Arkady Tempelman**Textbook:** R.V.Hogg, E.A.Tanis. "**Probability and Statistical Inference**" (seventh edition) . ISBN: 0-13-146413-2**Classroom:** 073 Willard**Time:** 2:30 PM – 3:20 PM (MWF)**Office hours:** Mondays and Wednesdays, 1 - 2 PM**Office:** 415 Thomas Building, Phone 863-0980**Home Page:** [www.stat.psu.edu/~arkady/course414.html](http://www.stat.psu.edu/~arkady/course414.html)**TA:** Yuexiao Dong, 316 Thomas Building, Ph: 863-3238, email: [yud101@psu.edu](mailto:yud101@psu.edu), OHs: TBA**Maximal number of points available:**

Home work: 100 points

2 tests:  $100 \times 2 = 200$  points

Final Examination: 100 points or 150 points (the option which is more favorable for the student)

Total:  $P_1 = 400$  or  $P_2 = 450$  points**GRADING POLICY:**Let  $Q = \max[(100/400)P_1, (100/450)P_2]$  (the percentage of earned points).**The lower cut-lines of Q for the grades are:**

<b>F</b>	<b>D</b>	<b>C</b>	<b>C+</b>	<b>B-</b>	<b>B</b>	<b>B+</b>	<b>A-</b>	<b>A</b>
0	58	68	76	78	80	86	88	92

**Main topics:**

1. Probability: definition and main properties.
2. Elements of combinatorics.
3. Conditional probability. Independent random events.

4. Random variables and their distributions.
5. Discrete distributions (binomial, geometric, Poisson, hypergeometric).
6. Continuous distributions (uniform, normal, exponential, gamma, chi-square).
7. Approximation of the binomial distribution by the Poisson and the normal distributions (the Poisson and the De Moivre - Laplace Theorems).
8. Multivariate distributions.
9. The Law of Large Numbers.
10. The Central Limit Theorem.

### **Midterm examinations**

Exam #1: October 18, 6:30 - 7:45 PM

Exam #2: November 15, 6:30 - 7:45 PM

### **ABOUT THE HOMEWORKS**

Students are expected to do the HWKs individually.

**Copied or collectively prepared identical homeworks will not be accepted.**

Please:

1. Explain every step in the problem solutions.
2. Write your name legibly.
3. Write the number of the assignment and the date.
4. Staple the sheets.
5. Submit your homework papers on time. The score for the homework will be reduced by 20% for each day that the homework paper is late; no homeworks are accepted after the graded ones have been returned to the students.
6. Retain all HWKs till the end of the semester.

### **ACADEMIC INTEGRITY**

All [Penn State Policies](#) regarding ethics and honorable behavior apply to this course.