Math 461, Introduction to Statistical Methods I, Fall 2021

Class Time: MWF 12-12:50p.m. in 102 University
Instructor: Dr. Marcin Bownik
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Office: 323 Fenton
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Office Hours: M 1p.m.-2p.m., Tu 10-11a.m., and F 11a.m.-12p.m., or by appointment
Textbook: *A First Course in Probability*, current Edition, Sheldon Ross

1. **Course objectives.** Students should be able to solve problems such as:
   - Calculate probabilities using the rules of probability, including the law of total probability and Bayes' Rule.
   - Calculate probabilities using elementary combinatorics.
   - Calculate probabilites for continuous random variables via integration.
   - Calculate distributions of random variables formed from elementary combinations of other random variables. In particular, the sum of two independent random variables via the convolution formula.
   - Calculate with standard probability distributions: Discrete: Bernoulli, Binomial, Poisson, Geometric; Continuous: Normal, exponential, uniform, Gamma. Calculate expectations and variances, and use moment inequalities to approximate probabilities.
   - Calculate limits in probability and limits in distribution.
   - Use the central limit theorem to approximate probabilities; use the Poisson approximation.
2. **Exams.** There will be two midterm in-class exam on Wed. 10/20, Wed. 11/10, and a final exam on Thu. 12/9, 10:15a.m.–12:15p.m.
3. **Quizzes.** There will be weekly quizzes on Fridays (unless specified otherwise). The lowest quiz score will be dropped.
4. **Homework.** Homework problems will be assigned every week and be due in on Wednesday on the material of the previous 1–2 weeks. Homework needs to be submitted on Canvas. You need to upload one PDF file with your solution directly to Canvas.
   Homework which is illegible or otherwise incomprehensible may not receive credit. Correct answers alone are insufficient for full credit. A clear and coherent derivation showing all work must be included. Answers should be worked out in advance on scrap paper, and then written up nicely to be turned in. I am well aware that answers may be available from various sources; turning in answers which you simply copy from another source is considered cheating and treated accordingly.
5. **Class Participation.** Class attendance and participation is mandatory.
6. **Grading.** The grading distribution will be as follows:

Class Participation	2%
Homework	18%
Quizzes	10%
Midterm Exams	20% each
Final Exam	30%

7. **Tentative schedule.**

Week 1	Chapter 1
Week 2	Chapter 2
Week 3	Chapter 3
Week 4	(midterm) Chapter 4
Week 5	Chapters 4 & 5
Week 6	Chapter 5
Week 7	(midterm) Chapter 6
Week 8	Chapters 6 & 7
Week 9	Chapter 7
Week 10	Chapter 8