

Department of Mathematics
Probability & Statistics I (Math 189-02) Fall 2017
MWF 12:10-1:00 pm ASB-B213

Prerequisites: Calculus I and Calculus II or an equivalent course – grade C or higher

Instructor:

Dr. Moussa Doumbia

Office **Annex III**, Room **231**

Office Number 202 806-5915

Office Hours: MTW 4pm-5pm

Email mdoumbia@howard.edu

Schedule of Exams:

September 29, 2017.....Exam I

October 27, 2017.....Exam II

November 24, 2017.....Exam III

FINAL EXAM Tuesday 12/4/2017 from 3:30pm to 5:30 pm

HOMEWORK: Success in the course is highly correlated with regular attendance and punctual completion of Homework.

. **Grading:** The weights in determining your final grade are as follows: **Active Participation – 2%**

 Quizzes (10 best grades at 10 points each point each)

 ... total 100

Three Exams (Sep 29, Oct 27, Nov 24)

 total 300

Comprehensive Final Exam (Dec 5, 3:30-5:30 pm)

 total 200

Final grades will be assigned using the following:

A 540-600;

B 480-539;

C 420-479;

**D 360-419;
F below 360.**

However, I reserve the right to subjectively adjust your semester grade. Please see me if you have any questions about how you stand. All individual scores will be posted and updated regularly on *Blackboard*. Note that, averages will not be computed on Blackboard. Rather, each score will be downloaded and then averaged in an (external) Excel spreadsheet.

Policies:

- Incompletes are only for students who suffer an unforeseen emergency in the course of the semester and cannot complete the work. They are not given in place of Ds or Fs.
 - No test grades are dropped
 - Late work will not be accepted.
 - There are NO makeups of quiz grades. We have at least 2 extra quiz grades, so when you are sick or unable to attend on quiz day, those will be your dropped grades.
 - Academic dishonesty, such as the unauthorized use of individual or documentary assistance, or outright plagiarism, will not be tolerated. See the university handbook for details.
 - ***No cell phone or computer usage during class, including texting.*** Please turn your ringer off before the start of class and keep your laptop closed.
 - Research has shown that students who regularly attend class tend to do better than those who do not. Please be on time.
 - Please see your instructor for the classroom calculator policy. Some classes do not allow graphics calculators.
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- For Academic code of student Conduct, ***American Disabilities Act (Howard phone # 202-238-2420)***, and Statement of Interpersonal Violence please refer to **HOWARD UNIVERSITY student HANDBOOK.**

Textbook:

Hogg & Tanis, Probability & Statistics, 9th edition.

Course Goals:

To introduce students to discrete and continuous probability functions and statistical analysis, including sample spaces, random variables, distributions, expectation, independence, and the law of large numbers.

Course Outline

A. Introduction to probability -- random experiments; sample spaces; axioms of probability; some methods of enumeration; conditional probability; independent events; laws of Total probability and Bayes theorem

B. Discrete Distributions -- discrete random variables; mathematical expectation; variance and standard deviation; uniform, hypergeometric Bernoulli, binomial and geometric and Poisson random variables; moment-generating function.

C. Continuous distributions -- continuous random variables; uniform, exponential, gamma, chi-square distributions and normal distributions; distributions of functions of a random variable

D. Multivariate Distributions -- Two dimensional random variables; marginal and conditional distributions; independence; expectation; covariance and correlation.

E. Sum of random variables -- distributions of sums of independent random variables, the central limit theorem.

Academic Code of Student Conduct (please see Howard University handbook): No copying, unauthorized use of calculators, books, or other materials, or changing of answers or other academic dishonesty will be tolerated. Cheating will not be tolerated. Anyone caught cheating will receive an F for the course and may be expelled from the university.

AMERICAN DISABILITIES ACT: Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students in need of accommodations due to a disability should contact the Office of the Dean for Special Student Services (202-238-2420, bwilliams@howard.edu) for verification and determination of reasonable accommodations as soon as possible after admission and at the beginning of each semester as needed.

Statement on Interpersonal Violence: Howard University takes sexual assault, dating violence, domestic violence, stalking and sexual harassment seriously. If a student reveals that he or she needs assistance with any of these issues, all responsible employees, including faculty, are required to share this information with the University Title IX Office (202-806-2550) or a student can be referred for confidential services to the Interpersonal Violence Prevention Program (IVPP) (202-238-2382) or the University Counseling Services (202-806-6870). For more information, please go to www.CampusSafetyFirst.Howard.Edu.

Course Contents:

1 PROBABILITY

1.1 Properties of Probability

1.2 Methods of Enumeration

1.3 Conditional Probability

1.4 Independent Events

1.5 Bayes' Theorem

2 DISCRETE DISTRIBUTIONS

2.1 Random Variables of the Discrete Type

2.2 Mathematical Expectation

2.3 Special Mathematical Expectations

2.4 The Binomial Distribution

2.5 The Negative Binomial Distribution

2.6 The Poisson Distribution

3 CONTINUOUS DISTRIBUTIONS

3.1 Random Variables of the Continuous type

3.2 The Exponential, Gamma, and Chi-Square Distributions

3.3 The Normal Distribution

3.4* Additional Models

4 BIVARIATE DISTRIBUTIONS

4.1 Bivariate Distributions of the Discrete Type

4.2 The Correlation Coefficient

4.3 Conditional Distributions

4.4 Bivariate Distributions of the Continuous Type

4.5 The Bivariate Normal Distribution

5 DISTRIBUTIONS OF FUNCTIONS OF RANDOM VARIABLES

5.1 Functions of One Random Variable

5.2 Transformations of Two Random Variables

5.3 Several Random Variables

5.4 The Moment-Generating Function Technique

5.5 Random Functions Associated with Normal Distributions

5.6 The Central Limit Theorem

5.7 Approximations for Discrete Distributions

5.8 Chebyshev's Inequality and Convergence in Probability

