

**INSTRUCTOR:** Dr. Ming Fang

**WHEN and WHERE:** 12:00-12:50pm Monday, Wednesday, and Friday. C122 Brown Memorial Hall

**OFFICE:** B-181 Brown Memorial Hall

**PHONE:** 823-8867

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**OFFICE HOURS** 4:00-6:00pm Monday, 9:30-12:30pm Tuesday, 4:00-5:00pm Wednesday, 2:00-4:00pm Thursday

**TEXTBOOK:** Probability and Statistical Inference 6<sup>th</sup> edition, Hogg and Tanis (2001).

**COURSE TITLE:** Probability and Statistics I.

**PREREQUISITE(S):** Math 251

**COURSE DESCRIPTION:** First of a two-semester sequence of mathematical statistics. Introduction to probability, univariate and multivariate probability distributions and their properties, distribution of functions of random variables, random samples and sampling distributions, and other selected topics.

**COURSE OBJECTIVES:** After completing MATH 351, the student will be able to:

1. comprehend the fundamental probability theory and probability models.
2. solve problems related to probability using integral calculus.
3. use definitions related to set theory and Venn diagrams.
4. solve problems using techniques related to permutations, combinations, and sampling.
5. understand the relationships between statistics and probability.
6. use statistical computing software (e.g., MINITAB, SPSS, SAS) and mathematical software (e.g., MATHCAD, MAPLE, MATHEMATICA) to solve problems.

**Course Requirements:** Each student must:

1. Attend lectures/demonstrations as I may have you work on problems that are handed in *class*. These problems may be **collected and graded** as part of homework. You can earn "bonus" points (up to a max of 20) by working problems at the board during classes/discussions. If you are absent, you will not have the opportunity to complete the problems. Therefore, attendance is very important to your success in this course. There are other reasons for attending class. For example, my exam questions will (for the most part) reflect the examples that I complete in class. **You are responsible for keeping current with *what is covered in class*--not necessarily just what is in the book.**
2. Complete assignments as scheduled by the instructor.

**SECTIONS AND TOPICS COVERED:**

CHAPTER 1: Empirical and Probability Distributions	
1.1	Basic Concepts
1.2	The Mean, Variance, and Standard Deviation
1.3	Continuous-Type Data
1.4	Exploratory Data Analysis
1.5	Graphical Comparison of Data
1.7	Probability Density and Mass Functions
CHAPTER 2: Probability	
2.1	Properties of Probability
2.2	Methods of Enumeration
2.3	Conditional Probability
2.4	Independent Events
CHAPTER 3: Discrete Distributions	
3.1	Random Variables of the Discrete Type
3.2	Mathematical Expectation
3.3	Bernoulli Trials and the Binomial Distribution
3.4	The Moment-Generating Function
3.5	The Poisson Distribution
CHAPTER 4: Continuous Distributions	
4.1	Random Variables of the Continuous Type
4.2	The Uniform and Exponential Distributions
4.3	The Gamma and Chi-Square Distributions
4.4	The Normal Distribution
4.5	Distributions of Functions of a Random Variable
CHAPTER 5: Multivariable Distributions	
5.1	Distributions of Two Random Variables
5.2	The Correlation Coefficient
CHAPTER 6: Sampling Distribution Theory	
6.1	Independent Random Variables
6.2	Distributions of Sums of Independent Random Variables
6.3	Random Functions Associated with Normal Distributions
6.4	The Central Limit theorem
6.5	Approximations for Discrete Distributions
6.6	The t and F Distributions
CHAPTER 7: Estimation	
7.1	Point Estimation

7.2	Confidence Intervals for Means
7.3	Confidence intervals for Difference of Two Means
CHAPTER 8: Tests of Statistical Hypotheses	
8.1	Tests About Proportions
8.2	Tests About One Mean and One Variance
8.3	Tests of the Equality of Two Normal Distributions
*8.7	Two-Factor Analysis of Variance
*8.9	The Wilcoxon Tests

**Exams:** There will be three 50-minute exams on nonoverlapping units of the course and a comprehensive final. I will announce an exam about a week in advance in class. For all exams, everyone must bring a pencil and a working calculator. Final exam will be given in accordance with University exam schedule.

**Grading Policy:**

Midterm exams	3 x 100 points
Final exam	200 points
Homework	100 points (plus participation bonus)
<b>Total</b>	<b>600 points</b>

The following grades are guaranteed if you earn the corresponding percentage of the total points by the end of the semester:

90-100%	87-89%	84-86%	80-83%	77-79%	74-76%
A	A-	B+	B	B-	C+
70-73%	67-69%	64-66%	60-63%	57-59%	Below 56%
C	C-	D+	D	D-	F

Alternatively, the homework score will be considered the equivalent of a midterm exam and the lowest of the four exams will be dropped. Then the remaining three together with the final examination score will be used to assign a letter grade. **Note: If you miss a test and the absence was not approved by the instructor, he reserves the right not to replace one of the three tests with the homework equivalent.**

**Academic Integrity Policies:** You are expected and encouraged to discuss problems with others; students often learn best from other students. However, the work you turn in should be completely your own. **Cheating during an exam will be penalized by disciplinary referral and grade penalty for all involved parties.**

**ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES:**

In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ADA) of 1990, we ask if you have a disability or think you have a disability please make contact with the Supporting Students through Disability Services (SSDS) office.

**USE OF CALCULATORS:**

Calculators can be used on tests. However, on certain tests certain function on the calculator cannot be used. These will be spelled out before each test.

**SPECIAL NOTE:** Please take advantage of the tutoring services provided by the ACCESS LAB. It is staffed by tutors that are extremely knowledgeable in the mathematics course listed above. Mathematics instructions here at NSU is a team effort. The ACCESS LAB is a part of that team effort. It is designed to help you achieve success in your mathematics course(s).