

COURSE SYLLABUS: Math 386-01, 3 credit hours, Spring 2008
Fundamentals of Probability and Statistics

CLASSROOM AND SCHEDULE: Tuesday and Thursday, 11:00 AM - 12:20 PM
Room 424, Lee Drain Building

INSTRUCTOR: Dr. Mary Swarthout
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Office Hours: Mon./Wed.: 9:00 - 10:30 AM
Tues./Thurs: 10:00 - 11:00 AM
Other Times by Appointment

COURSE OBJECTIVES/COURSE DESCRIPTION:

This course focuses on developing strong backgrounds in statistics and probability for preservice mathematics teachers at grades 4-8. Students are expected to practice communications skills and participate in hands-on activities and projects, including the use of mathematics manipulatives and technology. Students will also participate in class discussions and group work during this course. Topics will include National and Texas standards for teaching mathematics, statistics activities, and probability activities. Prerequisite: Math 285 with a grade of C or better. 3 semester hours.

COURSE OBJECTIVES:

Upon completion of this course, students will be able to:

- Organize and display data in a variety of formats (e.g., tables, frequency distributions, stem-and-leaf plots, box-and-whisker plots, histograms, pie charts)
- Apply concepts of center, spread, shape, and skewness to describe a data distribution
- Support arguments, make predictions, and draw conclusions using summary statistics and graphs to analyze and interpret one-variable statistics
- Demonstrate an understanding of measures of central tendency (e.g., mean, median, mode) and dispersions (e.g. range, interquartile range, variance, and standard deviation)
- Analyze connections among concepts of center and spread, data clusters and gaps, data outliers, and measures of central tendency and dispersion
- Calculate and interpret percentiles and quartiles
- Explore concepts of probability through data collection, experiments, and simulations
- Use the concepts and principles of probability to describe the outcome of simple and compound events
- Generate, simulate, and use probability models to represent a situation
- Determine probabilities by constructing sample spaces to model situations
- Apply knowledge of counting techniques such as permutations and combinations to quantify situations and solve problems

- Solve a variety of probability problems using combinations, permutations, and geometric probability (i.e., probability as the ratio of two areas)
- Use the binomial, geometric, and normal distributions to solve problems
- Apply knowledge of designing, conducting analyzing, and interpreting statistical experiments to investigate real-world problems
- Demonstrate an understanding of random samples, sample statistics, and the relationship between sample size and confidence intervals
- Apply knowledge of the use of probability to make observations and draw conclusions from single variable data and to describe the level of confidence in the conclusion
- Make inferences about a population using binomial, normal, and geometric distributions
- Demonstrate an understanding of the use of techniques such as scatter plots, regression lines, correlation coefficients, and residual analysis to explore bivariate data and to make and evaluate predictions.

TEXT AND MATERIALS:

Moore, D. (2007). *The Basic Practice of Statistics (4th Edition)*. New York: W.H. Freeman and Company.

A TI-83, TI-83+, or TI-84+ graphing calculator is required for this course. Supplemental materials provided by the instructor.

COURSE EVALUATION: Each student's grade will be based on:

3 Unit Tests (each 100 points)	300
Folder Checks (each 10 points - best 8 of 10)	80
Article Review	25
Project	45
Final Exam (Comprehensive)	<u>125</u>
Total Points	575

GRADING SCALE:

A	517 - 575
B	460 - 516
C	402 - 459
D	345 - 401
F	below 345

FOLDER CHECKS: One of the indicators of the understanding of a concept is the ability "to state it in your own words".

Communicating your understanding will be shown through your complete solutions to assigned homework problems and through written responses/reflections to readings, questions, situations, or other topics related to your study of mathematics. These responses will be collected **at least 10** times over the course of the semester and be **worth 10 points** each. Your **best 8 of 10** will be counted toward your final point total. Folder checks will include in-class work as well as out-of-class assignments. Because you will drop your lowest 2 scores, **NO LATE WORK WILL BE ACCEPTED.**

ATTENDANCE: Regular and punctual attendance is expected of every student. As a prospective teacher, you must demonstrate your reliability and conscientious attitude by your faithful attendance. Attendance will be taken every class. Any student who is more than 30 minutes late to class will be counted absent. Tardies will count against your attendance record (3 tardies - 1 absence). Unless approved by the instructor, leaving class early will count as an absence. If absent or tardy, you are still responsible for all material covered in class, and you will need to check with a classmate about what was discussed. If you have **2 or fewer** absences, your final exam grade can be substituted for your lowest unit test grade in figuring your final course grade. **Note:** Some folder check grades will come from in-class work - if you are absent, you lose that opportunity.

TESTS: Tests will include problems that are similar to problems assigned and worked in class. A portion of each test will include multiple choice or short answer problems. A second portion of each test will include problems where students must show all of their work correctly, as well as arrive at the correct solution to the problem, or provide complete explanations for the problem or situation posed.

Test Dates: February 21, April 3, and May 1

NO MAKE-UP TESTS WILL BE GIVEN unless the student has an Official University excused absence. Arrangements must be made in advance of the exam. If you miss a test without an official excuse, your final exam grade will be used as a replacement.

Final Exam Date:

Thursday, May 15 from 11:00 am - 1:00 pm

ACADEMIC DISHONESTY

All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

CLASSROOM RULES OF CONDUCT

Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. **Cellular telephones and pagers must be turned off before class begins.** Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

VISITORS IN THE CLASSROOM

Unannounced visitors to class must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. If the visitor is not a registered student, it is at the instructor's discretion whether or not the visitor will be allowed to remain in the classroom.

AMERICANS WITH DISABILITIES ACT

It is the policy of Sam Houston State University that no otherwise qualified disabled individual shall, solely by reason of his/her handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any academic or Student Life program or activity. SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Counseling Center [(936) 294-1720] and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential.

NOTE: No accommodation can be made until you register with the Counseling Center.

STUDENT ABSENCES ON RELIGIOUS HOLY DAYS POLICY

Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). The instructor will provide the student with a written description of the deadline for the completion of missed assignments and/or.