Probability and Statistics

Fall 2019

**Course no.** 3307.010
**Instructor** Trey Smith
**Time** MF 1:00-1:50, TR 12:30-1:20
**Location** MCS 215
**Office** MCS 219A
**Hours** MTWRF : 10:00-11:00, 2:00-3:00
**Phone** (325) 486-5441
**Email** trey.smith@angelo.edu
**Fax** (325) 942.2503

**Grading** Your grade will be determined using your homework/quiz grade, three tests, and a final exam. The homework/quiz grade will count as bonus points (see homework below), and each test will count as 1/3 of your final grade subject to your score on the final exam. The final exam will serve to determine your final grade in the following way; if your final exam is a 90 or better, you will gain a letter grade, if the final exam is less than 60, you will drop a letter grade.

**Homework** You will be assigned homework every class period. The next class, the homework will generally be collected or a daily quiz based on the homework given. Your homework average will be used as bonus points (up to 10) for the exam covering that material.

**Attendance** Regular class attendance is expected. There will be no make-up for missed homework, so a missed day may result in a zero.

**Calculators** Calculators will generally not be allowed during exams.

**Course Outline**

The following is a tentative outline of the material to be covered. *I reserve the right to change the material and/or sequence.*

Topics by Week

1) Sample Spaces, Axioms, Basic Theorems
2) Counting
3) Conditional Probability, Independence, Baye’s Theorem
4) Expectation, Variance, Discrete Random Variables
5) Properties of Mean and Variance, Review, **Test 1 (9.27)**
6) Special Discrete Random Variables
7) Continuous Random Variables
8) Special Continuous Random Variables
9) The Normal Distribution, Review, **Test 2 (10.25)**
10) Bivariate Distributions, Transformations
11) Expectations of Sums, Covariance
12) Moment Generating Functions, Markov and Chebychev
13) The Laws of Large Numbers, Central Limit Theorem, Review
14) **Test 3 (11.25)**
15) Review
16) Final Exam

**General University Policies**

Student Disability Services
ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA), and subsequent legislation.
The Office of Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student's responsibility to initiate such a request by contacting:

Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu

**Title IX at Angelo State University:**
Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits discrimination based on sex, which includes pregnancy, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation,
stalking, public indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Boone, J.D. You may submit reports in the following manner:

**Online:** www.angelo.edu/incident-form
**Face to Face:** Mayer Administration Building, Room 210
**Phone:** 325-942-2022
**E-Mail:** michelle.boone@angelo.edu

*Note, as a faculty member at Angelo State, I am a mandatory reporter and must report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325-942-2371), the 24-Hour Crisis Helpline (325-486-6345), or the University Health Clinic (325-942-2171).*

For more information about resources related to sexual misconduct, Title IX, or Angelo State’s policy please visit: www.angelo.edu/title-ix.

**Student Absence for Observance of Religious Holy Days:** A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. ([http://www.angelo.edu/opmanual/](http://www.angelo.edu/opmanual/) -- OP 10.19)

**Incomplete Grade Policy:** It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 [Grading Procedures](http://www.angelo.edu/opmanual/) for more information.

**Student Conduct Policies**

**Academic Integrity**
Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.
The College of Science and Engineering adheres to the Statement of [Academic Integrity](http://www.angelo.edu/opmanual/)
Plagiarism
Plagiarism is a serious topic covered in ASU's Academic Integrity policy in the Student Handbook. Plagiarism is the action or practice of taking someone else's work, idea, etc., and passing it off as one's own. Plagiarism is literary theft. In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list. Papers are subject to be evaluated for originality via Turnitin. Resources to help you understand this policy better are available at the ASU Writing Center.

Copyright Policy
Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

General Policies Related to this Course: All students are required to follow the policies and procedures presented in these documents:
Angelo State University Student Handbook
Angelo State University Catalog

Student Learning Outcomes

1. Students will demonstrate factual knowledge of the mathematical notation and terminology used in this course. Students will demonstrate the ability to read, interpret, and use the vocabulary, symbolism, and basic definitions of probability theory, including permutations and combinations, sample space, event, conditional probability, discrete and continuous random variables, expected value, mean, variance, probability density functions and distribution functions.

2. Students will be able to describe the fundamental principles, laws, and theorems arising from the basic definitions of probability theory. Students will be able to identify and use the postulates of probability, the basic properties of random variables, and laws and formulas that result from them, such as Bayes' Theorem, Chebyshev's Theorem, independence, mean and variance of linear combinations of random variables, and the Central Limit Theorem.

3. Students will apply course material along with techniques and procedures covered in this course to solve problems. Students will use the facts, formulas, and techniques learned in this course to solve problems involving elementary counting processes and ones related to special probability distributions, such as the binomial, hypergeometric, Poisson, exponential, and normal distributions.
4. Students will develop specific skills, competencies, and thought processes sufficient to support further study or work in this field or related fields. Students will acquire a level of proficiency in the fundamental concepts and applications necessary for further study in academic areas requiring a background in probability theory. These fields might include business, the social sciences, and the physical sciences and engineering, as well as mathematics.

Course Content

There is no textbook for this course. See the weekly topics (above) for a list of the content to be covered.