Math 3307
Probability and Statistics

Instructor: Trey Smith
Email: trey.smith@angelo.edu
Phone: 325 486 5441
Office: 219A
Office Hours: MWRF 10:00-11:00, 2:00-3:30

Course Information

Course Description
Mathematical models of random processes; probability spaces; random variables; dependence and independence; mean values and moments of random variables; density and distribution functions; laws of large numbers.

Prerequisite and Co-requisite Courses
Mathematics 2305, 3415

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

1. 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. 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. 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. 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.

**Required Texts and Materials**
There is no textbook for this course. All lessons will be provided through Blackboard.

**Technology Requirements**
Access to homework will be through Blackboard. You will need to scan or photograph any written assignments and submit them through Blackboard. So you will necessarily need a computer, iPad or phone with the above capability. A printer would undoubtedly make your life easier, but it is not required.

**Communication**
I will do my best to respond to email and/or telephone messages within 24 hours during working hours Monday through Friday. Weekend messages may not be returned until Monday.

**Written communication via email:** All private communication will be done exclusively through your ASU email address. Check frequently for announcements and policy changes. In your emails to faculty, include the course name and in your subject line.

**Virtual communication:** Office hours and/or advising may be done with the assistance of the telephone, and either Zoom or Collaborate (the choice will depend on which seems to work best). I will make sure you have clear instruction as to how to be connected.
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 **Test 1 (9.24)**
6) Special Discrete Random Variables
7) Continuous Random Variables
8) Special Continuous Random Variables
9) The Normal Distribution
10) Bivariate Distributions, Transformations **Test 2 (10.22)**
11) Expectations of Sums, Covariance
12) Moment Generating Functions, Markov and Chebychev
13) The Laws of Large Numbers
14) Central Limit Theorem
15) Central Limit Theorem

**Final Exam – Test 3 (12.8, 10:30-12:30)**

Grading

**Evaluation and Grades**

As it currently stands, there are 23 homework sets for you to complete this semester. Each of those is worth 5 points towards your homework grade. Since you are good at math (or you wouldn’t be in the class) you realize that your homework grade could be greater than 100. That is by design. That homework grade accounts for 10% of your overall grade.

Additionally, the exams will each account for 30% of your grade.
**Grading System**
Course grades will be dependent upon completing course requirements and meeting the student learning outcomes.

The following grading scale is in use for this course:
- A = 90-100 points
- B = 80-89 points
- C = 70-79 points
- D = 60-69 points
- F = 0-59 points

**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](#)

**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 university’s [Statement of Academic Integrity](#).

**Accommodations for Students with Disabilities**
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.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student’s responsibility to initiate such a request by contacting an employee of the
Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the Student Disability Services website. The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dr. Dallas Swafford  
Director of Student Disability Services  
Office of Student Affairs  
325-942-2047  
dallas.swafford@angelo.edu  
Houston Harte University Center, Room 112

**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 for more information.

**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. See ASU Operating Policy 10.19 Student Absence for Observance of Religious Holy Day for more information.

**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 Miller, J.D. You may submit reports in the following manner:
Online: Incident Reporting Form
Face to Face: Mayer Administration Building, Room 210
Phone: 325-942-2022
Email: michelle.miller@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 the Title IX website.

Information About COVID-19
Please refer to ASU’s COVID-19 (Coronavirus) Updates web page for current information about campus guidelines and safety standards as they relate to the COVID-19 pandemic.

Modifications to the Syllabus
This syllabus, including grade evaluation and course schedule, is subject to modification on potentially short notice based on developing circumstances.

---
1 https://www.angelo.edu/current-students/student-handbook/
2 https://www.angelo.edu/academics/catalog/
3 https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96
4 https://www.angelo.edu/current-students/disability-services/
5 https://www.angelo.edu/content/files/14197-op-1011-grading-procedures
6 https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of
7 https://www.angelo.edu/incident-form
8 https://www.angelo.edu/title-ix
9 https://www.angelo.edu/covid-19/