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 exams, quizzes, and homework will be through Blackboard. You will need to scan or photograph any written assignments and submit them through Gradescope, 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.

If you miss a class, you may either stream it live or watch the lecture at a later time. If you do that, you will be given a set of note questions that you must submit to receive credit for class attendance. Both the streaming and recording will be done using Collaborate.

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. If you would like to visit in person, you must make an appointment.

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 (9.18)
6) Special Discrete Random Variables
7) Continuous Random Variables
8) Special Continuous Random Variables
9) The Normal Distribution Test 2 (10.16)
10) Bivariate Distributions, Transformations
11) Expectations of Sums, Covariance
12) Moment Generating Functions, Markov and Chebychev
13) The Laws of Large Numbers
14) Central Limit Theorem

Final Exam – Test 3 (11.23, 1:00-3:00)

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 30% of your overall grade.

There are also 38 days of class – not counting any exam days. You will receive 3 points for each day that you are in class. Again, more than 100. That will be your Attendance grade which accounts for 10% of your overall grade. For those who are unable to attend class, you will simply fill out a 3-question class response in order to obtain your attendance points.
Additionally, the exams will each account for 20% of your grade.

Course grades will be determined as indicated in the table below.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Percent of Total Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>30%</td>
</tr>
<tr>
<td>Attendance</td>
<td>10%</td>
</tr>
<tr>
<td>Exams</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

**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

**Assignment and Activity Descriptions**

You will need to play close attention to any deadlines for lessons and attendance. Late submissions will not be accepted. All tests will be administered online. Pay close attention to instructions and policies.
More Course Information.

Course Delivery
To maintain academic quality while accommodating social distancing needs this semester, this course will combine face-to-face teaching with remote instruction.

The goal is to provide face-to-face instruction to students who want to return to campus, while also allowing students who may need to learn remotely to participate via virtual class sessions.

How Does It Work?
Your class may be divided and you will be placed into a smaller group of students to maintain physical distancing requirements in our assigned classroom space.

Your assigned group will receive a schedule of in-person class meetings. This schedule is not flexible. For instance, if you are supposed to attend class on a Monday, you cannot elect to go on Wednesday with another class group instead.

When you are not in the physical class, you will attend live remote sessions at the same time as our scheduled course. You will also be expected to complete coursework via Blackboard.¹

Please refer to this Health and Safety web page² for updated information about campus guidelines as they relate to the COVID-19 pandemic.

General Policies Related to This Course
All students are required to follow the policies and procedures presented in these documents:

- Angelo State University Student Handbook³
- Angelo State University Catalog⁴

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](#).5

**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](mailto:ADA@angelo.edu). For more information about the application process and requirements, visit the [Student Disability Services website](#).6 The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

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.

**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. Resources to help you understand this policy better are available at the ASU Writing Center.9

**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**
The University prohibits discrimination based on sex, which includes pregnancy, sexual orientation, gender identity, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination including: sexual assault, sex-based discrimination, sexual exploitation, sexual harassment, public indecency, interpersonal violence (domestic violence and/or dating violence), and stalking. As a faculty member, I am a Responsible Employee meaning that I am obligated by law and ASU policy to report any allegations I am notified of to the Office of Title IX Compliance.

Students are encouraged to report any incidents of sexual misconduct directly to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator at:

Michelle Boone, J.D.
Director of Title IX Compliance/Title IX Coordinator
Mayer Administration Building, Room 210
325-942-2022
michelle.boone@angelo.edu

You may also file a report online 24/7 at www.angelo.edu/incident-form.

If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2173 or the ASU Crisis Helpline at 325-486-6345.

For more information about Title IX in general you may visit [www.angelo.edu/title-ix](http://www.angelo.edu/title-ix).11
Required Use of Masks/Facial Coverings by Students

As a member of the Texas Tech University System, Angelo State University has adopted the mandatory Facial Covering Policy\(^\text{12}\) to ensure a safe and healthy classroom experience. Current research on the COVID-19 virus suggests there is a significant reduction in the potential for transmission of the virus from person to person by wearing a mask/facial covering that covers the nose and mouth areas. Therefore, in compliance with the university policy students in this class are required to wear a mask/facial covering before, during, and after class. Faculty members may also ask you to display your daily screening badge as a prerequisite to enter the classroom. You are also asked to maintain safe distancing practices to the best of your ability. For the safety of everyone, any student not appropriately wearing a mask/facial covering will be asked to leave the classroom immediately. The student will be responsible to make up any missed class content or work. Continued non-compliance with the Texas Tech University System Policy may result in disciplinary action through the Office of Student Conduct.

Modifications to the Syllabus

This syllabus, including grade evaluation and course schedule, is subject to modification. In particular, the COVID-19 pandemic may require significant changes in course delivery and content on potentially short notice.

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1. [https://blackboard.angelo.edu/](https://blackboard.angelo.edu/)
3. [https://www.angelo.edu/student-handbook/](https://www.angelo.edu/student-handbook/)
4. [https://www.angelo.edu/catalogs/](https://www.angelo.edu/catalogs/)
6. [https://www.angelo.edu/services/disability-services/](https://www.angelo.edu/services/disability-services/)
7. [https://www.angelo.edu/content/files/14197-op-1011-grading-procedures](https://www.angelo.edu/content/files/14197-op-1011-grading-procedures)
9. [https://www.angelo.edu/dept/writing_center/academic_honesty.php](https://www.angelo.edu/dept/writing_center/academic_honesty.php)
10. [https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of](https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of)
11. [https://www.angelo.edu/services/title-ix/](https://www.angelo.edu/services/title-ix/)