MATH 2305 Discrete Mathematics – Spring 2020

Instructor Information
Instructor: Dr. Susan Abernathy-Taylor
Office: MCS 220i
Phone: 325.486.5442
Office Hours: MF 8-9, 10-11; TR 1:30-2:00, 3:15-4:15; W 10-11, 1-2; or by appointment.

Email: All of the following addresses work. They all go to the same inbox; you need only send an email to one of them.
susan.abernathy@angelo.edu
susan.taylor@angelo.edu
staylor28@angelo.edu

Class Time/Location
TR 2:00-3:15pm in MCS 212

Textbook
No required textbook. We will be loosely following the notes available as a pdf here: Discrete Mathematics Lecture Notes

Grading System
Grades will be determined as follows:
Tests: 60% (best two 22% each, lowest 16%)
Homework: 18%
Final Exam: 22%

Final grades will be based on the following grading scale: A is 89.5+, B is 79.5-89.49, C is 69.5-79.49, D is 59.5-69.49, F is below 59.5.

Test grades and periodic overall averages will be posted in Blackboard; homework grades will not be posted in Blackboard.

Disclaimer
This syllabus is current and accurate as of its posting date, but will not be updated. For the most complete and up-to-date course information, email the instructor.

Attendance
Students are expected to attend every class. Attendance will be taken daily, and excessive absences will be reported to the appropriate university authorities.

Homework
Homework will be assigned at least once a week. Assignments will be announced in class and posted on BB. Your work must be legible, and multiple papers must be stapled (or you will receive points off). Your lowest two homework grades will be dropped. Late homework will not be accepted.
Quizzes (Bonus)
Quizzes may be given occasionally throughout the semester. Any points scored on quizzes will go towards bonus on other assignments. No make-up quizzes will be given.

Tests
There will be three tests during the semester. Your highest two tests grades will each account for 22% of your overall grade; your lowest test grade will count for 16% of your overall grade. There will also be a cumulative final exam at the end of the semester which is 22% of your overall grade.

Test Dates are: Tuesday February 11, Thursday March 19, and Thursday April 23.
The Final Exam is Tuesday, May 5, 1-3pm.

Make-up Policy
If you have a conflict with an exam, you must talk to me about it beforehand if possible. If you miss a test, your final exam grade will replace it. You will receive a grade of zero on any subsequent missed tests. Make-up tests will be given (or not) at the discretion of the instructor.

Expectations for Students
- Be on time.
- Don’t use technology in class. This includes phones, watches, tablets, laptops, video games, headphones, etc. If there is a reason you need to access a device during class, please come talk to me about it.
- Come prepared to take notes and be engaged in class.
- Maintain academic honesty (don’t cheat).
- Complete each assignment by the specified due date (or use late passes).
- Obtain materials from classes that you miss. I am happy to tell you what material we covered, give you any graded assignments, update you on upcoming due dates, or answer specific questions about homework or notes. However, I will not reteach material that you missed or give you copies of notes. You can get notes from a classmate or from the book.
- Positively contributing to the classroom environment. Be courteous and respectful to everyone in class. Feel free to contribute, but don’t monopolize the discussion.
- Being proactive about their grade in this course. You are not given a grade in a college course; you EARN your grade. It is your responsibility to put in as much effort as it takes to earn your desired grade. This includes utilizing (as needed) all available study aid options (going to office hours and/or Math Lab, meeting with the instructor, etc.) to resolve any questions or concerns you might have about any aspect of the course.

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:**  
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](http://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).

**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. The full details can be found in ASU Operating Policy OP 10.19 [Observance of Religious Holy Days](http://www.angelo.edu/title-ix).

**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/title-ix) 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 to disciplinary action and possible expulsion from ASU. The College of Science and Engineering adheres to the Statement of [Academic Integrity](#)vii.

- **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](#)viii.

- **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](#)ix
- [Angelo State University Catalog](#)x
Topics by Week
This subject matter listed below is tentative and subject to change. For current information about course topics, please contact the instructor.

1. Syllabus, set theory
2. Set theory, counting
3. Counting
4. Counting applications, Review
5. Test 1, Induction
6. Induction, Fibonacci Sequence
7. Fibonacci sequence, Golden Ratio
8. Arithmetic and Geometric sequences
9. Review, Test 2
10. Probability
11. Probability Functions, Divisibility
12. Fundamental Theorem of Arithmetic, Euclidean Algorithm, Graph theory
13. Graph theory, Graph Coloring
14. Review, Test 3
15. Special topics TBD, Review
16. Final Exam – Tuesday, May 5, 1-3pm

Mathematics 2305 – Discrete Mathematics I

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 and methods related to weak and strong induction, algorithms, set theory, combinatorics, probability, and graph theory.

2. Students will demonstrate knowledge of fundamental principles used in counting and problem solving. Students will demonstrate the ability to read and comprehend combinatoric methods applied to problems in probability and counting. Students will also demonstrate the ability to apply combinatoric methods as well as weak and strong induction to develop algorithms and basic mathematical proofs.

3. Students will apply course material along with techniques and procedures covered in this course to solve problems. Students will use the knowledge gained in this course to determine appropriate techniques for specific problems in probability and graph theory and to develop and apply algorithms to those problems.

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 proficiency in the fundamental concepts of graph theory, induction, probability, and combinatorics, at a level necessary for more advanced mathematics courses such as Discrete Mathematics 2, and Probability & Statistics.
Course Content
Ch1, Let’s Count Sets and Subsets, Sequences, Permutations.
Ch. 2, Combinatorial Tools Induction, Inclusion-Exclusion.
Ch. 3, Binomial Coefficients and Pascal’s Triangle Binomial Theorem.
Ch. 4, Fibonacci Numbers Identities, A formula for the Fibonacci numbers.
Ch. 6, Integers, Divisors, and Primes: Divisibility, The history of the primes, Factorization, Fermat’s Little Theorem, The Euclidean Algorithm, Primality testing .
Ch. 7, Graphs Paths and cycles, Hamilton Circuits.
Ch. 8, Trees How many trees are there? How to store a tree.
Ch. 9, Finding the Optimum Minimal spanning trees .
Ch. 10, Matchings in Graphs Matching Theorems.
Ch. 11, Combinatorics in Geometry Intersections, Counting Regions.
Ch. 12, Euler’s Formula Planar Graphs, Formula for Polyhedra.
Ch. 13, Coloring Maps and Graphs Four Color Theorem.
Ch. 14, Finite Geometries Finite Affine and Projective Planes.
Ch. 15, Cryptography Classical Cryptography, Public Key Cryptography.

1. Additional Topics; Arithmetic and Geometric Sequences

---

2. Report an Incident: www.angelo.edu/incident-form
3. Report an Incident: www.angelo.edu/incident-form
4. ASU Title IX: www.angelo.edu/title-ix
5. Observance of Religious Holy Days: http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of
8. ASU Writing Center: http://www.angelo.edu/dept/writing_center/academic_honesty.php
x. University Catalog: http://www.angelo.edu/catalogs/