MATH 2305 – 010 – Discrete Mathematics – Fall 2019

Contact Information:

- Instructor: Jesse Taylor
- Office: MCS 219E
- Email: jesse.taylor@angelo.edu
- Our Classroom: MCS 210
- Meeting Times: 8:00 - 9:15 TR
- Office Hours:
  - Monday: 12:30-2:30
  - Tuesday: 10:30-12:30
  - Wednesday: 1:30-3:30
  - Thursday: 10:30-12:30
  - Friday: by appointment
  - If the above times do not work please email me to set up another time to meet

Required Textbook

*Discrete Mathematics: Elementary and Beyond*, by Lovasz, Pelikan, and Vesztergombi.

Course Content

Selected sections from chapters 1-15 will be covered.

Homework/Quizzes

Homework will be assigned regularly throughout the semester. In general, I will assign problems once a week in worksheet format posted on Blackboard. We will also have quizzes throughout the semester, including the possibility of pop quizzes. Usually quizzes will consist of a couple of problems and will not take more than 15 minutes to complete. **No late quizzes or homework will be accepted**, regardless of whether or not you attend class. It is always your responsibility to attend class and know when an assignment is due and to make sure it is turned in or taken on time.

Tests

We will have three tests and a cumulative final exam. Below is a table containing the schedule for our tests, which is subject to change. If you have a conflict with one of the tests you must let me know at least one week before the test is taken to ensure that you receive a make-up exam. The earlier you let me know, the better.
<table>
<thead>
<tr>
<th>Test</th>
<th>Date</th>
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<tr>
<td>Test 1</td>
<td>September 26</td>
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<td>Test 2</td>
<td>October 24</td>
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<td>Test 3</td>
<td>November 21</td>
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<tr>
<td>Final Exam</td>
<td>8:00am - 10:00am, Tues Dec 10</td>
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**Grading**

Your grade in this class will be determined based on the following grading rubric.

- Homework/Quizzes: 20%
- Tests: 60% (20% each)
- Final Exam: 20%

Your final letter grade in this class will be determined based on a ten-point grading scale.

**Attendance**

Attendance will be taken regularly, and each student’s absences will be reported with their final grade at the end of the semester.

**Technology**

Unless you have special accommodations documented with the Student Life office, no cell phones, tablets, laptops, games, or other electronic devices may be used at any time during class or on any test.

**Study Aids**

- The Math Lab offers free math help to all students enrolled in mathematics courses at or below the level of Calculus. The Math Lab is located on the third floor of the library (C302) and its times are listed below.
  - Monday – Thursday: 9:00am – 8:00pm
  - Friday: 9:00am – 12:00pm
  - Sunday: 4:00pm – 8:00pm
- The mathematics department maintains a list of students who are interested in tutoring privately. Students who are interested in obtaining private tutoring or serving as private tutors should visit the math department’s office for more information.
- Feel free to come by my office for help. I will be in or near my office during office hours (or there will be a note telling you when I will be back). If my office hours are not convenient for you, email me or speak with me during class to arrange another time that is more convenient.
Notes

- If the university is unexpectedly closed for a scheduled class time, whatever was scheduled for that day and/or whatever was due that day will be scheduled and/or due on the next scheduled class day.
- All electronic correspondence will be sent to your ASU email account unless other arrangements are made.
- If you do not receive a graded homework assignment, quiz, or test on the day they are returned, please come by my office during office hours to pick the assignment up.
- Good luck. I want you to succeed in this course. If at any point during the semester you feel as if you do not understand the material, please come talk with me as soon as possible. An ounce of prevention is worth a pound of cure.
- All items and dates in this syllabus are subject to change as the semester progresses. Students will be notified in class of any changes, and the changes will not be updated within this syllabus.

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.

Additional Topics: Arithmetic and Geometric Sequences

Anticipated Schedule

Below is a table containing an approximate guide to what we will cover during each week of the semester. These topics are subject to change.
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<td>15</td>
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<td>16</td>
<td>Final exam: 8:00am-10:00am, Tues, Dec 10</td>
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**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

Angelo State University is committed to the safety and security of all students. If you or someone you know experience sexual harassment, sexual assault, domestic or dating violence, stalking, or discrimination, you may contact ASU’s Title IX Coordinator:

Michelle Boone
Director of Title IX Compliance
325-486-6357
michelle.boone@angelo.edu

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.

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 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.

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\textsuperscript{iv}.

**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]\textsuperscript{v}
  - [Angelo State University Catalog]\textsuperscript{vi}

\textsuperscript{1} Observance of Religious Holy Days: [http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of](http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of)

\textsuperscript{2} Grading Procedures: [http://www.angelo.edu/content/files/14197-op-1011-grading-procedures](http://www.angelo.edu/content/files/14197-op-1011-grading-procedures)

\textsuperscript{3} Academic Integrity: [http://www.angelo.edu/student-handbook/community-policies/academic-integrity.php](http://www.angelo.edu/student-handbook/community-policies/academic-integrity.php)

\textsuperscript{4} ASU Writing Center: [http://www.angelo.edu/dept/writing_center/academic_honesty.php](http://www.angelo.edu/dept/writing_center/academic_honesty.php)


\textsuperscript{6} University Catalog: [http://www.angelo.edu/catalogs/](http://www.angelo.edu/catalogs/)