Instructor Information

**Instructor:** Dr. Susan Abernathy-Taylor

**Office:** MCS 220i

**Phone:** 325.486.5442

**Office Hours:** M 9-12, T 2-4

W 9-11, F 9-12

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 Format: There are no regular class meetings. We will meet exactly four times during the semester for the four tests, at the time listed in the schedule. All homework for this course will be done online using MyMathLab.


Note: You must purchase a MyMathLab access code, which will also provide access to an electronic copy of the textbook. Purchasing a hard copy of the textbook is optional.

Grading: Grades will be determined as follows:

- Tests: 60% (15% each)
- Homework: 40%

Final grades will be based on a standard 10-point grading scale (A is 90+, B is 80-89.99, C is 70-79.99, D is 60-69.99, F is below 60).

Tests: Tests will be administered in MCS 215 and will be conventional pencil and paper exams. Test dates and locations are listed below. If you are not in the San Angelo area, you must make arrangements with a testing center to take the tests there (usually this is a nearby community college or university).

- Test 1: Tuesday, February 6 at 5:30pm in MCS 215
- Test 2: Tuesday, March 6 at 5:30pm in MCS 215
- Test 3: Tuesday, April 10 at 5:30pm in MCS 215
- Test 4: Tuesday, May 8 at 6pm in MCS 215

Tests are not cumulative and there is no cumulative final exam (the fourth test will take place during the final exam timeslot). If you have a conflict with an exam, please let me know as soon as possible. If you miss one test, the average of your other three test grades will replace it. If you miss a second test, you will receive a zero for that test grade. Make-up tests are given only under extreme circumstances at the discretion of the instructor.

Homework: Homework will be assigned online through MyMathLab. Late homework is not accepted, but you may work ahead if you wish. Your lowest three homework grades will be dropped.
Directions for how to register for MyMathLab can be found on our Blackboard course (“How to Register for MyMathLab” in the left-hand navigation). You will also access MyMathLab itself through our Blackboard course (“Access MyMathLab” in the left-hand navigation).

You will need to pay for an access code (bundled with your textbook or purchased directly from MyMathLab without a hard copy of the book). You may access MyMathLab for free for 14 days from the time that you register. After this free trial ends, you will be required to pay for access. Not having an access code does not warrant an extension on homework. Homework due dates are posted in MyMathLab.

**Student Responsibilities:** The student is solely responsible for:

- Maintaining academic honesty.
- Completing each assignment by the specified due date.
- Obtaining assignments and other materials for classes missed.
- Positively contributing to the classroom environment. Be courteous; don’t use your phone in class; be on time; don’t disrupt your fellow classmates.
- Being proactive about their grade in this course. You are not given a grade in a college course; you EARN your grade. You may want or need a particular grade to graduate, maintain a scholarship, or stay in athletics, for instance. **It is your responsibility to put in as much effort as it takes to earn this grade.** This includes utilizing (as needed) all available study aid options (going to office hours and/or Math Lab, reading outside textbooks, 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:** 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.

- **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
Weekly Schedule: This subject matter listed below is tentative and subject to change. For current information about course topics, please contact the instructor.

Week 1 – Voting Theory
Week 2 – Voting Theory
Week 3 – Weighted Voting, Fair Division
Week 4 – Test 1 (Tues. Feb. 6), Fair Division
Week 5 – Fair Division
Week 6 – Fair Division, Intro to Graphs
Week 7 – Graphs, Traveling Salesman Problems
Week 8 – Test 2 (Tues. March 6), Networks & Trees
Week 9 – MST’s, MaxST’s, Brute Force Algorithm, Percentages
Week 10 – Math of Finance
Week 11 – Reflections, Translations, Rotations
Week 12 – Test 3 (Tues. April 10), Glide Reflections
Week 13 – Fibonacci Numbers
Week 14 – Graphs, Charts, and Statistics
Week 15 – Probability
Week 16 – Test 4 (Tues. May 8)

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.

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Student Learning Outcomes

1. The students will demonstrate factual knowledge including the mathematical notation and terminology used in this course. Students will read, interpret, and use the vocabulary, symbolism, and basic definitions used in a selection from the following topics: voting theory, apportionment, the mathematics of money, probability, statistics, graph theory, and geometry.

2. The students will be able to describe generalizations of mathematics to real-world situations. Students will be able to describe, for example, the role played by mathematics in the theory of voting. The students will be able to describe connections between mathematical concepts and natural and societal phenomena.

3. The students will apply the course material along with techniques and procedures covered in this course to solve various problems and improve decision making. The students will apply such topics related to statistics and probability to improve decision making through a broader understanding of mathematics. They will learn to analyze problems using mathematical ideas and symbolism and learn to obtain the appropriate resources required to better deal with such problems.

4. The students will develop specific skills, competencies, and thought processes sufficient to support further study or work in this field or related fields. Students will develop new approaches and algorithms for solving problems related to networking, scheduling and paths.

Course Content

Textbook: Excursions in Modern Mathematics 9th ed. by Peter Tannenbaum, Prentice Hall
• Mathematics of Voting: Preference Ballots, Plurality, Borda, Runoff Voting, Comparison, Rankings
• Weighted Voting: The Banzhaf Power Index, The Shapley-Shubik Power Index
• Apportionment: Various methods including Hamilton’s, Jefferson’s, Adam’s, and Webster’s; The Alabama Paradox
• Euler Paths and Circuits: Euler Circuit Problems, Graphs, Euler’s Theorems, Fleury’s Algorithm, Eulerizing Graphs
• The Traveling Salesman Problem: Hamilton Paths and Circuits, Complete Graphs, Greedy and Nearest Neighbor Algorithms
• Networks: Trees, Spanning Trees, Kruskal’s Algorithm, Shortest Networks for Three or more points
• Scheduling: Directed Graphs, Priority Lists, The Decreasing Time Algorithm, Critical Paths, Independent Tasks
• Fibonacci Numbers and the Golden Ratio: Fibonacci Numbers, The Golden Ratio, Gnomons, Spiral Growth
• Math of Finance: Percentages, Simple Interest, Compound Interest, Annuities
• Mathematics of Symmetry: Rigid Motions, Reflections, Rotations Translations, Glide Reflections, Patterns
• Fractals: The Koch Snowflake, The Sierpinski Gasket, Chaos, The Mandelbrot Set
• Collecting Data: Sampling, Random Sampling, The Capture-Recapture Method, Clinical Studies
• Descriptive Statistics: Graphical Methods, Variables, Data Summaries, Spread Probability: Random Experiments, Sample Spaces, Permutations, Combinations, Equiprobable Spaces, Odds
• Normal Distributions: Approximately Normal Distributions, Normal Curves, Distributions of Random Events, Statistical Inference.

i Observance of Religious Holy Days: http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of
ii Grading Procedures: http://www.angelo.edu/content/files/14197-op-1011-grading-procedures
iii Academic Integrity: http://www.angelo.edu/student-handbook/community-policies/academic-integrity.php
iv ASU Writing Center: http://www.angelo.edu/dept/writing_center/academic_honesty.php
vi University Catalog: http://www.angelo.edu/catalogs/