Math 1332.010
Contemporary Math

Instructor: Dr. Susan Abernathy-Taylor
Email: susan.abernathy@angelo.edu
Phone: 325-486-5442
Office: MCS 220i

Office Hours: MW 10am-1pm, TR 12:15-2:15pm, or by appointment.

Course Information

Course Meetings
Tuesday/Thursdays 11:00am-12:15pm in MCS 110

Course Description
Topics may include graphs and networks, theory of elections and apportionment, statistics, and mathematical models. Recommended for students who wish to satisfy their core mathematics requirement but do not plan to take additional mathematics coursework.

Prerequisite Courses
Completion of Mathematics Texas Success Initiative (TSI) requirements.

Required Texts and Materials
Excursions in Modern Mathematics, 9th edition, by Tannenbaum

Communication
Faculty will usually respond to email and/or telephone messages within 24 hours during working hours Monday through Friday. Weekend messages may not be returned until the next work day.

Written communication via email: All private communication should 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 section number in your subject line.

**Student Responsibilities**

The student is solely responsible for:

- **Staying home and completing the Wellness Screening in Ramport if you are experiencing any symptoms of COVID-19 or have known exposure to a person who has tested positive.**
- **Maintaining academic honesty.**
- **Completing each assignment by the specified due date.**
- **Obtaining assignments (graded or newly assigned) 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.

**Grading**

**Grading System**

Grades will be determined as follows:

- Test Average: 85%
- Homework: 15%

Your test average will either consist of the average of your four test grades (if you do not take the optional final exam), or the average of your four test grades and your final exam grade (if you choose to take the optional final exam).

The following grading scale is in use for this course:

- **A = 89.5-100 points**
- **B = 79.5-89.49 points**
- **C = 69.5-79.49 points**
- **D = 59.5-69.49 points**
- **F = 0-59.49 points**
Tests and Final Exam
There will be 4 tests during the semester, as well as an optional cumulative final exam.

Test and Final Exam dates are listed here.
  Test 1: Tuesday, September 14
  Test 2: Thursday, October 7
  Test 3: Thursday, October 28
  Test 4: Thursday, November 18
  Final Exam (OPTIONAL): Tuesday, December 7, 10:30am-12:30pm

If you miss a test, your final exam grade will replace it. Any subsequent missed tests will result in a grade of zero. Make-up tests are given only under extreme circumstances at the discretion of the instructor.

Homework
There will be a written homework assignment from the textbook for each section, which you will submit online through Blackboard as a PDF. Your lowest three homework grades will be dropped at the end of the semester when computing your overall grade. Late homework will not be accepted.

Course Schedule
This subject matter listed below is tentative and subject to change. For current information about course topics, please contact the instructor.
Subject matter by week:
  Week 1 – Voting Theory
  Week 2 – Voting Theory
  Week 3 – Weighted Voting, Fair Division
  Week 4 – Test 1, Fair Division
  Week 5 – Fair Division
  Week 6 – Fair Division, Intro to Graphs
  Week 7 – Graphs, Test 2
  Week 8 – Traveling Salesman Problems, Networks & Trees
  Week 9 – MST’s, MaxST’s, Brute Force Algorithm, Percentages
  Week 10 – Math of Finance, Test 3
  Week 11 – Math of Finance, Transformations
Week 12 – Transformations, Glide Reflections
Week 13 – Fibonacci Numbers, Test 4
Week 14 – Graphs, Charts, and Statistics
Week 15 – Probability
Week 16 – Final Exam (optional)

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.

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

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.

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.

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.  

**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.