Course Information

Course Description

A survey of ideas in contemporary mathematics. 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

None
Student Expectations

- Maintain academic honesty.
- Complete each assignment by the specified due date.
- Be a positive influence in classroom learning environment by being courteous and respectful to everyone in class. This includes virtual office hours and written communication.
- 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 (attending virtual office hours and/or getting help from the Math Lab, emailing the instructor, etc.) to resolve any questions or concerns you might have about any aspect of the course.

Student Learning Outcomes

Upon completion of this course, students will be able to:

- **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: basic algebraic techniques, voting theory, apportionment, the mathematics of money, probability, statistics, graph theory, and geometry.

- **Students will 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 social phenomena.

- **Students will apply course material along with techniques and procedures covered in this course to solve problems and improve decision making.** 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.

- **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. Students will develop basic algebraic skills necessary for the support of their academic careers.
Course Content
1. **Mathematics of Voting**: Preference Ballots, Plurality, Borda, Runoff Voting, Pairwise Comparison
2. **Weighted Voting**: Weighted Voting, The Banzhaf Power Index,
3. **Apportionment and Sharing**: Fair-Division Games, Sealed Bids
4. **Apportionment**: Various methods including Hamilton’s,
5. **Euler Paths and Circuits**: Euler Circuit Problems, Graphs, Euler’s Theorems, Fleury’s Algorithm, Eulerizing Graphs
7. **Networks**: Trees, Spanning Trees, Kruskal’s Algorithm,
8. **Math of Finance**: Percentages, Simple Interest, Compound Interest, Annuities
9. **Mathematics of Symmetry**: Rigid Motions, Reflections, Rotations Translations,
10. **Descriptive Statistics**: Graphical Methods, Data Summaries, Spread
11. **Probability**: Probabilities

**Additional Algebraic Techniques:**
- Order of Operations- numeric applications for PEMDAS with no variables.
- The Distributive Law
- Absolute Value
- Exponent Rules
- Simplifying Radicals
- Polynomial Addition & Subtraction
- Polynomial Multiplication
- Factoring by greatest common factor (GCF)
- Factoring Basic Trinomials
- Solving Linear Equations

Course Delivery
This is a face-to-face course. We will meet in person. If you are absent for ANY reason, you will be expected to watch and recording of the lecture and complete coursework via Blackboard.¹

Attendance
Attendance will make up 5% of your overall course grade.
- If you are in class and actively participating, you will receive a 100 for a daily grade after uploading your notes to Gradescope.
- If you are absent (not physically present) then you will receive a 0 for a daily grade.
- To be counted virtually present and have your 0 removed (changed to a 90) you must watch the recording of the lecture and fill in your notes as you watch. Once
complete, you must upload a scan of your notes into the spot corresponding to the missed date in the homework assignment tab in Blackboard before the next class meeting.

Textbook

We will not be using a textbook this semester. You will be printing notes and bringing those to class daily. There is a free online textbook that is available as an additional resource if you feel you need it. However, I do not know how closely it resembles the notes we will be using. The link is

http://www.opentextbookstore.com/mathinsociety/

Technology Requirements

• You will need a calculator. If you do not already have one, I recommend the TI 30XIIS. It usually runs less than $12.
• You will also need a scanner (or a scanning app for your phone),
• Webcam and microphone. (Most laptops come equipped with both a webcam and microphone.)
• You will need access to a printer. If you don’t have your own, there are computer labs on campus for you to print your notes/worksheets.

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 section number in your subject line.

Virtual communication: Office hours will be held in Blackboard Collaborate and may require the assistance of a telephone for audio.

Grading

Evaluation and Grades

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>Daily grades (15%) and attendance (5%)</td>
<td>20%</td>
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<tr>
<td></td>
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</tr>
<tr>
<td>Tests 1 – 3 (20% each)</td>
<td>60%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Grading System**

Course grades will depend on completing course requirements and meeting the student learning outcomes.

This course uses the following grading scale:

- A = 90.00-100 points
- B = 80.00-89.99 points
- C = 70.00-79.99 points
- D = 60.00-69.99 points
- F = 0-59.99 points

The last day to drop a class is Monday, November 22. However, unless you satisfy your TSI Math requirement you may not drop this class.

**Exams**

**Tests/Final Exam**: There will be three regular exams during the semester and a non-cumulative final exam. If you leave the room during an exam, I may take your test and grade it AS IS! There will be no make-up exams. If you do miss an exam, get in touch with me immediately. You may be required to take a comprehensive final exam to replace the missing exam.

Tentative Test Dates:

- Test 1: Friday, September 17th
- Test 2: Friday, October 15th
- Test 3: Friday, November 12th

Test 4 (Final Exam): Monday, December 8th at 10:30am

**Homework Policy**

- Homework will be assigned over every section. Daily work will consist of worksheets.
- Homework worksheets will be distributed in class and will also be available under the Homework Assignment tab in Blackboard.
- Homework will be submitted in Gradescope.
- Homework is due BEFORE CLASS BEGINS (due by 9:30am in Gradescope).
- **No late homework will be accepted.**
You will need to scan pictures of every page of your homework. Convert it to a pdf and upload it to Gradescope.

**IT IS YOUR RESPONSIBILITY TO MAKE SURE THE UPLOAD IS SUCCESSFUL BEFORE IT IS DUE.**

- If you are going to miss class, you are still responsible for submitting your homework in Gradescope before it is due.
- If you need assistance with an assignment, see me for help before it is due.
- I will drop 4 homework grades at the end of the semester to compensate for unavoidable circumstances.
- Box and/or highlight your answers.
- Write legibly. If your answer cannot be read, it is wrong. Show all necessary work.

**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

**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.

**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.

**Use of Masks/Facial Coverings by Students**

ASU is not currently mandating facial coverings; however, please feel free to wear a facial covering when you are indoors among groups of people. Facial coverings have been an effective part of the COVID-19 management strategy. These safety precautions support our efforts to continue operations without disruptions and provide as traditional of an educational experience as possible.
# Modifications to the Syllabus

This syllabus, including grade evaluation and course schedule, is subject to modification on potentially short notice based on developing circumstances.

## Course Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic or Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Syllabus, Multiplication and Division of Integers</td>
</tr>
<tr>
<td>2</td>
<td>Basic Elements of an Election; Addition and Subtraction of Integers</td>
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<tr>
<td>3</td>
<td>Voting Methods</td>
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<tr>
<td>4</td>
<td>Weighted Voting; Linear Equations</td>
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<tr>
<td>5</td>
<td>Banzhaf; linear equations</td>
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<tr>
<td>6</td>
<td>Fair Share; Absolute Value</td>
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<td>7</td>
<td>Sealed Bids</td>
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<td>8</td>
<td>Apportionment</td>
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<tr>
<td>9</td>
<td>Test 1 Review; Fraction Notes</td>
</tr>
<tr>
<td>10</td>
<td>Review Quiz for Test 1; Fraction WS</td>
</tr>
<tr>
<td>11</td>
<td><strong>Test 1 (9/17/2021)</strong></td>
</tr>
<tr>
<td>12</td>
<td>Hamilton’s Method; Street-Routing Problems; Introduction to Graphs</td>
</tr>
<tr>
<td>13</td>
<td>Introduction to Graphs</td>
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<tr>
<td>14</td>
<td>Euler’s Theorem; Order of Operations</td>
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<tr>
<td>15</td>
<td>Eulerizing Graphs; Traveling Salesman Problem; Order of Operations</td>
</tr>
<tr>
<td>16</td>
<td>Hamilton Paths &amp; Circuits; Brute Force Algorithm</td>
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<tr>
<td>17</td>
<td>Brute Force Algorithm; Nearest Neighbor Algorithm</td>
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<tr>
<td>18</td>
<td>Networks and Trees; Spanning Trees</td>
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<td>19</td>
<td>Spanning Trees; Kruskal’s Algorithm</td>
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<tr>
<td>20</td>
<td>Exponents</td>
</tr>
<tr>
<td>21</td>
<td>Test 2 Review; Polynomial Addition and Subtraction</td>
</tr>
<tr>
<td>22</td>
<td>Review Quiz for Test 2; Polynomial Addition and Subtraction</td>
</tr>
<tr>
<td>23</td>
<td><strong>Test 2 (10/15/2021)</strong></td>
</tr>
<tr>
<td>24</td>
<td>Math of Finance Definitions; MOF Packet 1; Distributive Laws</td>
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<tr>
<td>25</td>
<td>Math of Finance Packet 1; Distributive Laws</td>
</tr>
<tr>
<td>26</td>
<td>Annuity Packet</td>
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<tr>
<td>27</td>
<td>Annuity Packet</td>
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<tr>
<td>28</td>
<td>Rigid Motions: Translations and Reflections</td>
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<td>29</td>
<td>Rotations: GCF</td>
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<tr>
<td>30</td>
<td>Test 3 Review - Packet A; GCF</td>
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<tr>
<td>31</td>
<td>Test 3 Review - Packet B; GCF</td>
</tr>
<tr>
<td>32</td>
<td>Math of Finance Packet 2;</td>
</tr>
<tr>
<td>33</td>
<td>Frequency Tables; Graphs &amp; Charts</td>
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<tr>
<td>34</td>
<td>Review Quiz for Test 3</td>
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<tr>
<td>35</td>
<td><strong>Test 3 (11/12/2021)</strong></td>
</tr>
<tr>
<td>36</td>
<td>Means, Medians and Percentiles</td>
</tr>
<tr>
<td>37</td>
<td>Means, Medians and Percentiles; Range and Standard Deviation</td>
</tr>
<tr>
<td>38</td>
<td>Future Value of Annuities; Advanced Rigid Motions</td>
</tr>
<tr>
<td>39</td>
<td>Probability</td>
</tr>
<tr>
<td>40</td>
<td>Probability; Core Assessment, IDEA</td>
</tr>
<tr>
<td>41</td>
<td>Selected Statistics, Annuities, and Probability exercises</td>
</tr>
<tr>
<td>42</td>
<td>Review Quiz for Test 4</td>
</tr>
<tr>
<td>43</td>
<td><strong>Final Exam (Test 4), Monday, December 6th from 10:30am – 12:30pm</strong></td>
</tr>
</tbody>
</table>

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1. [https://blackboard.angelo.edu/](https://blackboard.angelo.edu/)
2. [https://www.angelo.edu/current-students/student-handbook/](https://www.angelo.edu/current-students/student-handbook/)
3. [https://www.angelo.edu/academics/catalog/](https://www.angelo.edu/academics/catalog/)
5. [https://www.angelo.edu/current-students/disability-services/](https://www.angelo.edu/current-students/disability-services/)
6. [https://www.angelo.edu/content/files/14197-op-1011-grading-procedures](https://www.angelo.edu/content/files/14197-op-1011-grading-procedures)
8. [https://www.angelo.edu/current-students/writing-center/academic_honesty.php](https://www.angelo.edu/current-students/writing-center/academic_honesty.php)
9. [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)
10. [https://www.angelo.edu/incident-form](https://www.angelo.edu/incident-form)
11. [https://www.angelo.edu/title-ix](https://www.angelo.edu/title-ix)
12. [https://www.angelo.edu/covid-19/](https://www.angelo.edu/covid-19/)