Math 1332.060 Fall 2019 Introduction to Contemporary Mathematics MCS 112 @ 1:00 – 1:50 PM MWF J Montemayor

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, contact the instructor

Instructor
Juan Montemayor
Office: MCS 219 F
Phone #: 325 – 486 – 5438
Email: juan.montemayor@angelo.edu

Office Hours
Monday and Wednesday: 8:30 -9:00 AM, 10:00-11:00 AM, 2:00 – 3:15 PM
Tuesday and Thursday 9:30 – 11:00 AM and 2:15 – 3:15 PM also Friday: 8:30 – 9:00 AM, 10:00-11:00 AM

Math Lab Hours – Tentative Hours
Located on the third floor of the library room C302
Monday – Thursday: 9:00 AM – 8:00 PM, Friday: 9:00 AM – 12:00 PM, and Sunday 4:00 – 8:00 PM

Notice
You are encouraged to be in attendance during each class meeting. No make-ups will be given for missed quizzes, homework assignments, or exams. If you leave early, come late, leave the classroom you may be counted absent for the day. There are four major exams to be given during the semester plus a comprehensive final exam. If you miss an exam, a meeting between student and instructor will be held to see if anything can be done to alleviate the problem. Student must initiate the conversation with a written valid excuse stating the reason for missing exam. This must be done as quickly as possible. Preferably within a week of the missed exam. If the excuse is deemed to be valid by the instructor, then a solution will proposed by the instructor. In most cases a comprehensive final exam will be given and grade will replace missed exam. Otherwise, the grade for missed exam will become a zero. No option for removing a second missed exam.

Cell Phone Use
Use of cell phone in class is strongly discouraged. Put phone away when entering classroom. You may be asked to leave the class if you are seen making use of your cell phone in any manner. Touching, glancing, and leaving the classroom to answer the phone will all be considered instances of disruption to the class and any disruption of class will result in immediate dismissal from class. You may return to class only after a meeting with instructor outside of class time. In case you have a need for your phone – emergencies – let me know and an exception will be made for that case.

Important Dates (Tentative Dates)
Exam 1: Wednesday September 18, 2019    Exam2: Friday October 11    Exam 3: Monday November 4
Exam 4: Monday November 25    Exam 5: Final Exam on Wednesday December 11, 2019
Thanksgiving Holidays: November 27-29    Drop Day: Thursday October 31

Textbook
Textbook: *Excursions in Modern Mathematics 9th ed.* by Peter Tannenbaum, Prentice Hall. No access code required. If you bought a book with an access code – it is not a waste, but will not be used in this class. Homework will be done on your paper from textbook or from notes posted on blackboard.
Grading Periods
There will be five grading periods (each will count 20% of semester grade). The first four grading periods will consist of an in class exam (75% of grading period) and a daily grade (25% of grading period). The last grading period consists of only the final exam (100% of grading period). More will be said in class about the grading process.

Daily Grade
There will be eight daily grades per grading period. The lowest of the eight grades will be dropped and the remaining seven grades will be averaged to compute your daily grade (average) for the testing period. Each daily grade will consist of quiz and a homework grade. It is your responsibility to attempt all homework problems and ask questions outside of class or in class as time permits. Homework and quizzes will each make up 50% of your daily grade. No make-up grades will be given. Any missed daily grade will become a zero. It is possible that some of the homework assignments will not be graded in their entirety. More will be discussed on the first day of class.

Homework (50% of daily grade)
Reviewing your notes is always considered part of your homework. It is strongly suggested that you attempt every problem assigned for homework. Reviewing examples from class will also be helpful in preparing for exams and quizzes. No late homework accepted. Homework can be turned in early but not late.

Quizzes (50% of daily grade)
You must be in class to get any credit on quiz. No make-ups on missed quizzes. It does not matter whether your absence is excused or unexcused. You get enough daily grades dropped to account for most absences.

Attendance
Attendance is essential to learning new material. You may be counted absent if you leave the classroom for any reason during lecture. Make friends and use their notes to see what was missed on those days that you do miss class.

Exams
There will be four in class exams during the semester plus a final exam. Exams are the most important part of your grade. Exam grades are the primary source in determining your semester grade. Daily grades provide a small percentage of the grade but not enough to create a major change in grades from your test averages. No make-ups on missed exams. Read front page of syllabus for details on missed exams.

Semester Letter Grade
A semester average will be computed based on daily grades and in class exams. An in-person explanation of the grading process will be given on first day in class.

100 – 90 is an A, 80-89 is a B, 70-79 is a C, 60 – 69 is a D, any average below 60 is an F.
Use of calculators
Some work must be done without the use of a calculator or any other electronic device of any type. When calculators are allowed, you may use a non-graphing calculator approved by the instructor. Failure to have an approved calculator will mean that you cannot use any calculator at all. It is commendable that you have and are able to use a graphing calculator but use of one is not essential in this class. If work is done at home, you may use a calculator but your answers cannot be calculator based. Algebraic work must be shown. The calculator is being used only to facilitate operations with numbers – not to replace number representation.

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: basic algebraic techniques, 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. Students will develop basic algebraic skills necessary for the support of their academic careers.
Course Content – material for the course will be obtained from topics that discussed in the chapters that are listed below.

**Textbook:** *Excursions in Modern Mathematics 9th ed.* by Peter Tannenbaum, Prentice Hall

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

We may also discuss within the topics above and also individually some of the algebraic ideas presented below:

**Additional Algebraic Techniques:**
- Order of Operations- numeric applications for PEMDAS with no variables.
- The Distributive Law
- Absolute Value- evaluating the absolute value of numbers as a distance from 0
- Exponent Rules- basic integer exponents (both positive and negative), along with the product rule, quotient rule, and power rule
- Simplifying Radicals- simplifying square roots and cube roots with simple variables under the radicals; will include both perfect squares/cubes and others that have to be factored out
- Polynomial Addition & Subtraction
- Polynomial Multiplication- both distributive property and FOIL are introduced
- Factoring by GCF- factoring polynomials strictly by greatest common factor
- Factoring Basic Trinomials- factoring trinomials with a leading coefficient of 1, or a GCF that lends a leading coefficient of 1
- Solving Linear Equations- determine if a number is a solution to an equation; then solving basic linear equations; no rational equations are covered.
The subject matter listed below is tentative and subject to change and adaptation. For current updated information about course topics, contact instructor.

<table>
<thead>
<tr>
<th>Week(s)</th>
<th>Topics – topics of algebra as written on previous page will be discussed throughout the semester</th>
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| 1       | Chapter 1 Mathematics of voting  
Preference ballots, method of election  
majority, plurality, Borda-Count, and other methods as time permits |
| 2       | Finish topics from chapter 1, give out Chapter 1 test  
Begin chapter 2, the power of a player and weighted voting systems |
| 3       | Continue with chapter 2  
Weighted voting, types of voters and quotas, and power index of voter  
The Banzhaf Power Index, The Shapley-Shubik Power Index  
Give out Chapter 2 test  
Begin with chapter 3 – fair division games |
| 4       | Finish Chapter 3, fair-division and sharing,  
Give out Chapter 3 test |
| 5       | Begin with Chapter 4 – apportionment methods  
Review material (chapter tests) for first major exam  
First major exam  
Continue working with Chapter 4  
Give out chapter 4 test |
| 6       | Begin with chapter 5 material – basics of graphs, notation,  
Euler Circuit (and paths) Problems, Euler’s Theorems, Fleury’s Algorithm,  
Eulerizing Graphs – adding an additional edge to create a graph that has an Euler Circuit  
Chapter 5 Exam – Concept of graphs |
| 7       | More on graph theory concepts,  
Euler paths and circuits Euler and Hamiltonian paths and circuits and common properties, differences  
Hamilton Paths and Circuits, Complete Graphs, Greedy and Nearest Neighbor Algorithms  
Chapter 6 test |
| 8       | Begin with chapter 7 – trees  
Basic concepts, properties, and definitions  
Trees, Spanning Trees, Kruskal’s Algorithm, Shortest Networks for Three or more points |
| 9       | Finish chapter 7, chapter 7 exam,  
General sequences, arithmetic, geometric, Fibonacci sequences, chapter test |
| 10      | Second major Exam  
Begin with chapter 10 |
| 11      | Finish chapter 10, chapter 10 test, |
| 13      | Reflections, translations, rotations, other motions  
Golden Ratio, gnomons, Fractals |
| 14      | Measures of central tendency, Basic Probability and preliminary concepts of statistics |
| 15      | Statistics and concepts of a normal curve Normal curves and normal distribution Other topics of interest / review for final exam if time permits |
| 16      | Final exam |
**Student Responsibilities**
The student is *solely* responsible for:

- Completing each assignment by the specified due date.
- Obtaining assignments and other materials for classes from which they are absent.
  - Utilizing, as needed, all available study-aid options (including meeting with the instructor, referring to outside texts, etc.) to resolve any questions that they might have regarding homework, course material, etc.
- Realizing from the beginning of the course the grade that they may need or want to graduate, maintain a scholarship, stay in athletics, etc. … and give as much effort as it takes to obtain this grade.

**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:**

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 Boone, J.D. You may submit reports in the following manner:

**Online:** [Title IX Incident Form](#)  
**Face to Face:** Mayer Administration Building, Room 210  
**Phone:** 325-942-2022  
**E-Mail:** michelle.boone@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 [ASU Title IX website](#).
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 iii.

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 iv 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 v.

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 vi.

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

- In the event that the university is 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 time.
- All electronic correspondence will be sent to your ASU e-mail account unless other arrangements are made.
- Feel free to come by my office at any time for help. I will definitely be near my office during my office hours (or there will be a note telling you when I will be back). If my office hours are not convenient for you, meet with me to arrange for another time that is more convenient.

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i [http://www.angelo.edu/incident-form](http://www.angelo.edu/incident-form)
ii [http://www.angelo.edu/title-ix](http://www.angelo.edu/title-ix)
iii 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)
iv Grading Procedures: [http://www.angelo.edu/content/files/14197-op-1011-grading-procedures](http://www.angelo.edu/content/files/14197-op-1011-grading-procedures)
vi ASU Writing Center: [http://www.angelo.edu/dept/writing_center/academic_honesty.php](http://www.angelo.edu/dept/writing_center/academic_honesty.php)
viii University Catalog: [http://www.angelo.edu/catalogs/](http://www.angelo.edu/catalogs/)