Spring 2018 Syllabus for Math 1332.020 Introduction to Contemporary Mathematics
MCS212 MWF@ 8:00 – 8:50 AM

Disclaimer
All items contained in this syllabus are subject to change as the semester progresses. Students will be notified in advance of any changes. For the most complete and up-to-date course information, contact the instructor.

Instructor
Juan Montemayor
Office: MCS219F Phone #: 325-486-5438 email: juan.montemayor@angelo.edu

Notice
You are encouraged to be in attendance during each class meeting. No make-ups will be given for missed quizzes or homework assignment. You will not be allowed to make-up any missed exam. It does not matter whether you have an excused or unexcused absence.

If you are late to class or leave early, you may be counted absent for the day. Student must attend the entire period to be counted present.

In the event that an exam is missed and a written excuse is given within a reasonable time that is acceptable to instructor, the student will be given the option of taking a comprehensive final exam to replace missed exam. The comprehensive exam will count as the missed exam and as the final exam. A second missed exam will be automatically entered as a zero.

Use of cell phone in class is strongly discouraged.
You are encouraged to put cell phone away when entering classroom. If you have a cell phone out of your pocket/backpack/ purse during class lecture or reach and touch into your pocket or purse, you will be considered as making use of cell phone. If such an event occurs, you will be asked to leave the classroom. Disruptions of class lecture will be dealt in the same manner. Personal situations may require you to have cell phone available in case of emergencies – notify instructor of that possibility. Other class rules will be discussed on the first day of class.

<table>
<thead>
<tr>
<th>MCS 219F</th>
<th>Tentative Office Hours</th>
<th>Phone 325-486-5438</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>8:30 -10:00 AM 9:00 – 10:00 AM 7:00 – 7:45 PM</td>
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<tr>
<td>Tuesday</td>
<td>1:00 – 2:00 PM 8:00 – 10:30 1:00 – 2:00</td>
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</tr>
<tr>
<td>Wednesday</td>
<td>8:00 – 10:30 7:00 – 7:45 PM</td>
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<tr>
<td>Thursday</td>
<td>9:00 – 10:00 AM</td>
<td></td>
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<tr>
<td>Friday</td>
<td>8:30-10:00 AM</td>
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<table>
<thead>
<tr>
<th>Tentative Exam Dates</th>
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<tbody>
<tr>
<td>Exam 1 Thursday Feb.8</td>
</tr>
<tr>
<td>Take Home Exam Due March 8</td>
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<tr>
<td>Exam 2 (Midterm) In class exam Thursday March 8</td>
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<tr>
<td>Exam 3 Thursday April 5</td>
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<tr>
<td>Take – Home Exam Due May 10</td>
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<tr>
<td>Exam 4 - in class exam</td>
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<tr>
<td>Final Exam Thursday May 10</td>
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<tr>
<td>Thursday May 10 10:30AM–12:30 PM</td>
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Homework will be done from textbook or from handouts provided by instructor.

<table>
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<tr>
<th>Last Day to Drop</th>
<th>Spring Break March 12 – March 16</th>
<th>Spring Holiday Friday March 30</th>
<th>Final Exam Thursday May 10 @ 10:30 AM – 12:30 PM</th>
</tr>
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<tbody>
<tr>
<td>Monday April 2</td>
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</table>
Math Lab Hours

<table>
<thead>
<tr>
<th>Days</th>
<th>Time</th>
<th>Days</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>Monday – Thursday</td>
<td>9:00am-8:00pm</td>
<td>Friday</td>
<td>9:00am-12:00pm</td>
</tr>
<tr>
<td>SUNDAY</td>
<td>4:00 PM – 8:00 PM</td>
<td>(Starting Sunday, January 21)</td>
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Math Lab is located on the third floor of the library

Room C302

Prerequisite
Basic arithmetic and reading skills. Be able to spend time analyzing word statements and develop a methodical approach to solution of problems from given information.

Testing Periods
You will have five testing Periods during the entire semester. Each of the periods will be worth 1/5 of your semester grade. Four of the testing periods will consist of an exam and a daily grade. The exam is 88 % of the testing period grade and the remaining 12 % will come from a daily grade. The fifth and final testing period consists entirely of a final exam. Further explanation will be given on the first day of class.

Exams
You will have a total of five exams given during the semester including a comprehensive final exam at the end of the semester. **It is up to the discretion of the instructor** whether final exam grade will replace a single missed exam. Your final exam is comprehensive and not optional – all students must take them. Date and time for final exam is not negotiable. You have more than a fifteen-week notice of when the final exam is scheduled. The grade on exam for testing period will be 88 % of testing period grade. The remaining 12 % will come from a daily grade given for the testing period. Final exam makes up a full 100 % of the grade for testing period.

Daily Grade
There will be five daily grades per testing period – none for final exam. The lowest of the five daily grades in a testing period will be dropped and the remaining four daily grades will be averaged to get daily grade average for testing period. The daily grade obtained will make up 12 % of testing period.

Homework
Each daily homework grade is worth 30 % of daily grade. Homework assignments can be turned in early but not late. It will be done at beginning of class.

Quiz
Each daily quiz grade is worth 50% of daily grade. No make-up grades. If you miss class for any reason at all, the quiz grade becomes a zero for that day.

Class Participation
Grade for class participation is worth 20 % of daily grade. Attendance is included as part of this grade. Grade is subjective – up to instructor what grade is given.
Grading
An average of the five testing periods will be computed. This average will be your semester grade and will determine your semester letter grade. Standard grading for this class will be used. See below.
An average of

100 – 90 is an A, 89 – 80 is a B, 79 – 70 is a C, 69 – 60 is a D, any average below 60 is an F.

*More explanation on grading of homework, quizzes and class participation will be given in class.*

Miscellaneous

1. **You are encouraged to collaborate on your homework assignments with other classmates, but each**
   a. student must turn in his or her own homework.

2. **Calculators are allowed on quizzes or tests. There may be sections of work where calculators will not be allowed.**
   a. All answers must be non-calculator based – exact solutions are required.
   b. Algebraic work must be shown. No cell phones may be used at any time.

3. **See instructor for additional information** on course rules, assignments, and other procedures.

4. **Exams are to be finished on time. No additional time will be given.**
   All assignments should be written in a form that is legible and easy to read – as much as possible.
   You should avoid using writing instruments that leave light print (hard to read).
   Make sure to print your name at the top of front page on all assignments that are turned in.

   **Number guessing is never an acceptable method to answer a question. A correct answer without the appropriate logical(algebraic) work will be counted as being wrong.**

   **See instructor for additional information on course rules, assignments, and other procedures.**
Mathematics 1332 – An Introduction to Contemporary Mathematics - 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.

5. The T - Section will provide students with skills in a variety of mathematical topics needed to be successful in the credit bearing course Math 1332. Students will gain proficiency in arithmetic and algebraic topics necessary for success in the Contemporary Mathematics section of the course.

Course Content

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.
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</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  
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 |
| 13      | 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 |
**Syllabus Statements**

**Attendance**

Attendance will be taken regularly. Please inform me of any absences prior to the absence whenever possible.

**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**

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

- 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 for help. Most times I will be near my office during my office hours (or there will be a note telling you when I will be back). In some cases, I may have an appointment or meeting elsewhere. 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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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)
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)
4 ASU Writing Center: [http://www.angelo.edu/dept/writing_center/academic_honesty.php](http://www.angelo.edu/dept/writing_center/academic_honesty.php)
6 University Catalog: [http://www.angelo.edu/catalogs/](http://www.angelo.edu/catalogs/)