Math 1332.020 Spring 2022 Introduction to Contemporary Math

Syllabus Statement:

PDFs posted in Blackboard for this course are intended for print purposes only. If you use assistive technology to complete your coursework, an alternative format may better meet your needs. Please contact your instructor to obtain an alternative format and to discuss appropriate software or other accommodations for the best student experience.

Instructor: Juan Montemayor

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Office: MCS 219F

Office Hours:
MF: 10-11 AM, 2:00-3:30 PM W: 8-9:00 AM, 2:00-3:00PM TTh: 8:45-9:30 AM 2:00-3:30 PM

Course Information

Course Description

Topics vary from basic arithmetic rules and properties, to algebraic concepts such as factoring, and various topics of interest. We will look at method of elections, sharing, power of individuals or groups. We will also look at fair division of goods, some ideas of graphs including Euler graphs and Hamiltonian graphs, and some statistics. Other topics will be chosen along the way. For a complete description see course content and talk to instructor.

Prerequisite Skills

You should have basic arithmetic skills that allow you to perform calculations with and without the use of a calculator. You should be able to follow written and oral/verbal instructions. Some basic use of computer technology. You should have above average knowledge of basic arithmetic and have the ability to memorize terminology, definitions, and mathematical techniques. It would be useful to have a desire to learn and relearn topics of interest such as those listed in the course content.

Other Prerequisite Skills

Be able to access Internet websites, use ASU Library resources as needed, and have some proficiency with Microsoft Word, and the ability, curiosity, and desire to learn more. Although we do not make as much use of the calculator as you would like, make sure you are able to use simple non-graphing calculators. If you do happen to have graphing calculators – use it to check your homework problems. Graphing calculators are not allowed on exams or quizzes. All answers should be non-calculator based. Be able to follow directions such as how and where the math lab is located – same for your professor's office (all professors). Understand the instructor's definition of studying – not the day before an exam, but studying throughout the semester.

Course Content

Textbook: NOT REQUIRED but if you need to make use of a textbook – the following textbook provides an idea of most topics discussed in class

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
3. **Apportionment and Sharing:** Fair-Division Games, The Divider-Chooser Method, The Lone-Divider Method, The Lone Chooser Method, The Last Diminisher Method, Sealed Bids, Markers
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 will discuss some but not all of the topics above

We may also discuss within the topics above and also individually some of the algebraic ideas presented below. These topics are covered in a 1332 T-section course and they may also be discussed in a non T section 1332 course

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.

Student Learning Outcomes

Upon completion of this course

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 Delivery

This is a face-to-face course with online components. Students are expected to have access to Blackboard.[1] From time to time, the class lecture – including completed notes – may be recorded and published to make available to those unable to attend class. No guarantee of this happening or of the quality of the recording. Not being in class will be considered being absent from class. Subject to change depending on developing situations.

Required Texts and Materials- Textbook is not required

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

Text book is not required. My notes will be sufficient for both in class notes and homework assignments. There are cases in which you will be required to print assignments (notes, quizzes – tests – homework). You may print both notes and assignments as needed. If you feel that you need additional help, you may find it in the following textbook or some other internet site of your choosing.

Technology Requirements

To successfully complete this course, students need to be able to access blackboard collaborate – be able to scan and submit documents through software in a PDF format Calculators will not be allowed on quizzes or exams – use on HW to check answers – do not use calculators to provide an answer - Answers must always be non-calculator based. You may need an app to submit quizzes at the end of class sessions. You may have to submit documents back to me (quizzes and tests) and that will require use of your phone. There will be a learning curve so do not panic. You will learn faster than I. Let me know as soon as possible if you will be having trouble doing any of this.

A printer and/or a scanner will be useful. I am not requiring you to have a printer – but you will need to be able to scan documents. There are apps that can be used for scanning. All submitted documents must be submitted as PDF documents. Be prepared in an emergency to go online – not likely but possible. I am not using Top Hat but if you have other classes that use it and you have the knowledge to use it, then feel free to use it in this class.

Communication

Use your Angelo State email address for communications between you and I. Include your name and class(section or time class meets).
No assignment will be taken after due date and time. Be prepared – do not wait till the last minute – give yourself at least 10 minutes of leeway. No excuse will be accepted for being late or not being able to turn in assignment on time. Do not send your assignment via email unless I tell you to do so.
We do not keep the same working hours. Keep that in mind when you send an email at 2:00 AM. The instructor will try to respond to emails and/or telephone messages within 24 hours during working hours Monday through Friday. In the event you do not hear from me, please send me a second and even a third message. I will not be ignoring you but I may be swamped with information – information overload and your email may have gotten lost in the pile. Weekend messages may not be returned until Monday.
Email courtesy – if you send me an email with a question - wait at least 60 seconds for a possible response.

Office hours will be done in person but if done as Virtual Office hours, they will be held on Blackboard Collaborate will have a link available for you to join me. An email request is strongly suggested during times that I am in the office – if I am already in class, I will be unable to read your message.

Remember that you are sharing blackboard space with the entire class. Keep it official – as much as possible. Work group is encouraged – feel free to do join in, work together. Quizzes and Exams are to be completed as individual work. Exams must be taken in class. You will not be allowed to take exams online. See instructor for additional information – or for possible sites such as student testing center

You are not officially on any excused list unless I talk to you in person (or virtually)
This is true for athletic purposes or – sickness (virus – or other related illness)
Athletes, I need you to keep me informed. Letters from Athletic Department are useful, but I still need to hear information from you.

Grading

Evaluation and Grades

Course grades will be determined as indicated in the table below. See Calendar on Blackboard course (for this class) to see dates for exams and due dates for other assignments (Homework/Quizzes)

Assessment	Percent of Total Grade
13 Quizzes Drop lowest three quizzes Must be taken in class with no make-ups on any missed quizzes missed quiz will be given a grade of zero.	8 %
13 Homework Assignments Drop lowest three HW assignments grade of zero on late or missed assignments. Blackboard will shut down and not accept documents after the deadline even if it is only seconds late.	12 %
Exams No make-ups three regular exams plus final exam	80 %
Bonus points – up to instructor	Up to instructor – none may be given
Total	100%

For a list of topics to be discussed in class – see page 2 and 3 under Course Content

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 (Grades are not rounded up)
(Grades are not rounded up)
Any other grade point average will be left up to instructor. No grade will be curved up.

Assignment and Activity Descriptions

Assignments will be turned in on time
(no late papers accepted / no makeup assignment given).
Exams and quizzes will be given in class and turned in as given. Homework will be turned in through blackboard as PDF documents.
Scan the document (this does not mean to take a picture – a picture may be part of the process – you are scanning), save the document in PDF format on your computer – or however your phone stores it, submit through blackboard as a PDF document (no other way).
No late work will be accepted. There is no reason to miss an assignment and I will drop enough homework assignments and quizzes to account for missing one or two of them. In the event that you have a good reason and the instructor accepts your reason for missing one single exam, the final exam may replace the grade of missed exam.

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[2]
- Angelo State University Catalog[3]

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.[4]

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.[5] 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[6] for more information.

Plagiarism

Plagiarism is a serious topic covered in ASU's Academic Integrity policy[7] 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.[8]

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[9] 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[10]
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.[11]

Information About COVID-19

Please refer to ASU's COVID-19 (Coronavirus) Updates[12] web page for current information about campus guidelines and safety standards as they relate to the COVID-19 pandemic.

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 – to be updated during semester
will include topics listed under course description on page 2 and 3 of this syllabus.
Schedule of exams, and due dates for quizzes and exams can be seen on class calendar posted on the blackboard course.

Date	Topic or Module	Activities	Homework	Homework Due Date

[1] https://blackboard.angelo.edu/
[2] https://www.angelo.edu/current-students/student-handbook/
[3] https://www.angelo.edu/academics/catalog/
[4] https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96
[5] https://www.angelo.edu/current-students/disability-services/
[6] https://www.angelo.edu/content/files/14197-op-1011-grading-procedures
[7] https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96
[8] 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
[10] https://www.angelo.edu/incident-form
[11] https://www.angelo.edu/title-ix

[12] https://www.angelo.edu/covid-19/

https://www.angelo.edu/covid-19/ of Academic Integrity is now on Page 97 in the Student Handbook, so use this link to get students to the right page: https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=97

- The Academic Affairs office has started using new software to maintain all the university operating policies and procedures. Consequently, these policy links have changed:
    - OP 10.11 Grading procedures: https://angelo.policystat.com/policy/10659448/latest/

      OP 10.19 Student Absence for Observance of Religious Holy Day: https://angelo.policystat.com/policy/10659368/latest/