MATH 3305
DISCRETE MATHEMATICS 2

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Office Hours: MWF 8:00am – 11:00am (online only, via Bb Collaborate)

Course Information

Course Description
Graphs, matrices, computational methods, and other discrete structures.

Prerequisite and Co-requisite Courses
MATH 2305.

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

- **Students will demonstrate factual knowledge of the mathematical notation and terminology used in this course.** Students will demonstrate the ability to read, interpret, and use the vocabulary and methods related to weak and strong induction, algorithms, combinatorics, probability, graph theory, and decision trees.

- **Students will demonstrate knowledge of fundamental principles used in decision making and problem solving.** Students will demonstrate the ability to read and comprehend combinatoric methods applied to problems in decision making and graph theory. Students will also demonstrate the ability to apply combinatoric methods as well as weak and strong induction to develop algorithms and basic mathematical proofs.

- **Students will apply course material along with techniques and procedures covered in this course to solve problems.** Students will use the knowledge gained in this course to determine appropriate techniques for specific problems in
decision theory, and graph theory and to develop and apply algorithms to those 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 acquire proficiency in the fundamental concepts of graph theory, induction, and combinatorics, at a level necessary for more advanced mathematics courses such as Numerical Analysis, and Probability & Statistics.

**Course Delivery**

To maintain academic quality while accommodating social distancing needs this semester, this course will use a split delivery model that combines face-to-face teaching with remote instruction.

The goal is to provide face-to-face instruction to students who want to return to campus, while also allowing students who may need to learn remotely to participate via virtual class sessions.

**How Does It Work?**

Your class will be divided and you will be placed into a smaller group of students to maintain physical distancing requirements in our assigned classroom space.

Your assigned group will receive a schedule of in-person class meetings. This schedule is not flexible. For instance, if you are supposed to attend class on a Monday, you cannot elect to go on Wednesday with another class group instead.

When you are not in the physical class, you will be responsible for completing assigned coursework in Blackboard. This work can be completed any time before the posted deadline.

Please refer to this Health and Safety web page for updated information about campus guidelines as they relate to the COVID-19 pandemic.

**Required Texts and Materials**


Most of the course material will be drawn from this book. Supplemental material will be taken from a variety of sources.
Technology Requirements
To successfully complete this course, students need to be able to scan and send paper homework via email, watch lesson recordings online, and use microphone and/or webcam to attend virtual office hours via Blackboard Collaborate (link in Blackboard).

Communication
Faculty will usually respond to email and/or telephone messages within 24 hours during working hours Monday through Friday. Email during the weekend is inconsistent.

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 and/or advising will be done exclusively through Blackboard Collaborate.

Grading
Assessments
Homework will be assigned almost every class, and will be due on the Tuesday following the assignment date. A quiz covering those homework assignments may be given on that Tuesday as well. No late homework will be accepted, and no make-up quizzes will be given. I will drop three of the lowest of your homework or quiz grades.

Evaluation and Grades
Your grade will be determined by averaging all of your quiz and homework grades. There will also be a comprehensive final worth 100 points. The final will modify your grade as follows:

90 or better on the final will improve your overall grade by a letter grade.
60 or worse will worsen your overall grade by a letter grade.
A score between 60 and 90 will not change your overall grade.

Grading System
Course grades will be dependent upon completing course requirements and meeting the student learning outcomes.

The following grading scale is in use for this course:
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)

**Attendance and Late Work**
Attendance will be taken regularly. Please inform me prior to an absence whenever possible. No late homework will be accepted, and a missed quiz will result in a 0.

**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 to 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:
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.

Looking up the answers to homework questions will be considered plagiarism. Further, should students work together on homework, they must credit each other on their submissions.

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
The University prohibits discrimination based on sex, which includes pregnancy, sexual orientation, gender identity, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination including: sexual assault, sex-based discrimination, sexual exploitation, sexual harassment, public indecency, interpersonal violence (domestic violence and/or dating violence), and stalking. As a faculty member, I am a Responsible Employee meaning that I am obligated by law and ASU policy to report any allegations I am notified of to the Office of Title IX Compliance.
Students are encouraged to report any incidents of sexual misconduct directly to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator at:

Michelle Boone, J.D.
Director of Title IX Compliance/Title IX Coordinator
Mayer Administration Building, Room 210
325-942-2022
michelle.boone@angelo.edu

You may also file a report online 24/7 at www.angelo.edu/incident-form.

If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2173 or the ASU Crisis Helpline at 325-486-6345.

For more information about Title IX in general you may visit www.angelo.edu/title-ix.

Required Use of Masks/Facial Coverings by Students
As a member of the Texas Tech University System, Angelo State University has adopted the mandatory Facial Covering Policy to ensure a safe and healthy classroom experience. Current research on the COVID-19 virus suggests there is a significant reduction in the potential for transmission of the virus from person to person by wearing a mask/facial covering that covers the nose and mouth areas. Therefore, in compliance with the university policy students in this class are required to wear a mask/facial covering before, during, and after class. Faculty members may also ask you to display your daily screening badge as a prerequisite to enter the classroom. You are also asked to maintain safe distancing practices to the best of your ability. For the safety of everyone, any student not appropriately wearing a mask/facial covering will be asked to leave the classroom immediately. The student will be responsible to make up any missed class content or work. Continued non-compliance with the Texas Tech University System Policy may result in disciplinary action through the Office of Student Conduct.

Modifications to the Syllabus
This syllabus, including grade evaluation and course schedule, is subject to modification. In particular, the COVID-19 pandemic may require significant changes in course delivery and content on potentially short notice.
Course Schedule

This is a tentative schedule for this course. I reserve the right to modify the content or order.

Week. Topic
1. Cardinality, Counting
2. Occupancy Problems, Sampling
3. Pigeonhole Principle, Designs
4. Modular Arithmetic and Applications
5. Algorithms
6. Graphs, Chromatic Numbers, Chromatic Polynomials
7. Edge Colorings, Applications
8. Kuratowski’s Theorem, Konig’s Theorem
9. Trees, Planar Codes
10. Ramsey’s Theorem, Relations
11. Finite Groups and Fields
12. Matroids

1 https://www.angelo.edu/student-handbook/
2 https://www.angelo.edu/catalogs/
3 https://www.angelo.edu/student-handbook/community-policies/academic-integrity.php
4 https://www.angelo.edu/services/disability-services/
5 https://www.angelo.edu/content/files/14197-op-1011-grading-procedures
6 https://www.angelo.edu/student-handbook/community-policies/academic-integrity.php
7 https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of
8 https://www.angelo.edu/services/title-ix/
9 http://www.texastech.edu/downloads/ttus-policy-face-coverings.pdf