

Math 4091.0040 Introduction to Graph Theory, Optimization, and Mathematical Methods Spring 2022



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

Email: juan.montemayor@angelo.edu

Phone: (325)486-5438

Office: MCS 219F

Office Hours: see class webpage for updated information

MF: 10:00-11:00AM, 2:00-2:30 PM W: 8:00-9:00 AM, 2:00-3:30

TTh: 8:45-9:30 AM 2:00-3:30 PM

Course Information

Course Description

We will discuss basic ideas and definitions of Graph Theory, Optimization(Linear Programming), and some concepts of Mathematical Methods.

Prerequisite Skills

Mathematical maturity – up to material normally covered in Calculus

Other Prerequisite Skills

Reading material without any instruction and completing assignments in a timely manner

Course Content

Textbook: No textbook required

Some of the material will be taken from the first few chapters (chapters 1-4) of the following textbooks

“Graphs an Introductory Approach” by Robin Wilson and John Watkins

“ Operations Research Principles and Practice” by Don T. Phillips

“ Mathematical Methods in Chemistry and Physics” by Michael E. Starzak

This course will introduce the initial ideas of

Graph Theory – definitions, examples, and applications including but not limited to the following topics

Graphs – necessary examples, definitions, and algorithms used to discuss Eulerian and Hamiltonian graphs, Trees, Planarity, Coloring Maps(and graphs)

Optimization – definition and examples of linear programing- may also discuss some ideas of nonlinear programing

Mathematical Methods in Chemistry and Physics

Topics to be discussed as time permits

Required material:

text and notes will be provided by instructor

Prerequisite Courses:

Calculus I and Calculus II, Physics I,
some experience with a programming language

Learning Objectives:

Student should gain a basic understanding of topics in the beginning chapters of the listed textbooks

Student will be learn to conduct individual readings and supervised class presentations

Student will develop confidence in their ability to read and present topics of interest

Course Delivery

This is a face-to-face course. Student will meet with instructor 1-3 times per week
Individual time will be given for solving problems and preparing for presentations

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 |
|---|------------------------|
| Attendance | 40 % |
| Homework Assignments – work on problems | 40 % |
| Presentations | 20 % |
| Total | 100% |

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)

Assignment and Activity Descriptions

Assignments will be turned in on time

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](#)¹
- [Angelo State University Catalog](#)²

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](#).³

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](#).⁴ 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](#)⁵ for more information.

Plagiarism

Plagiarism is a serious topic covered in ASU's [Academic Integrity policy](#)⁶ 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](#).⁷

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](#)⁸ 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](#)⁹

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](#).¹⁰

Information About COVID-19

Please refer to ASU's [COVID-19 \(Coronavirus\) Updates](#)¹¹ 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 |
|------|-----------------|------------|----------|-------------------|
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- ¹ <https://www.angelo.edu/current-students/student-handbook/>
 - ² <https://www.angelo.edu/academics/catalog/>
 - ³ <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96>
 - ⁴ <https://www.angelo.edu/current-students/disability-services/>
 - ⁵ <https://www.angelo.edu/content/files/14197-op-1011-grading-procedures>
 - ⁶ <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96>
 - ⁷ https://www.angelo.edu/current-students/writing-center/academic_honesty.php
 - ⁸ <https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of>
 - ⁹ <https://www.angelo.edu/incident-form>
 - ¹⁰ <https://www.angelo.edu/title-ix>
 - ¹¹ <https://www.angelo.edu/covid-19/>