

MATH 3415: Calculus III, Summer 2022

Contact Information

Instructor: Karl Havlak
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Virtual Office Hours:

8:30 – 9:30 a.m. MTWRF; 1:00 – 2:00 p.m. MTWRF
or by *appointment*

Office hours will be held virtually. This [link](#)ⁱ will take you to the online course room where I will hold office hours. If I am not present or responding, you may need to email me to get my attention. You may also use the Discussion Board to pose questions for the class.

Textbook

A First Course in Mathematical Modeling (5th ed.) by Giordano, Fox, and Horton.

Blackboard

This course has an associated [Blackboard page](#)ⁱⁱ where you will have access to grades, assignments, videos, handouts, and other course-related items.

Course Content

Selected sections from Chapters 1 – 5 and 11 will be studied.

Grading System

The final course grade will be determined according to the weights in the table that follows.

Activity	Weight
Homework	35%
Unit Projects	40%
Final Project	20%
Check-in Quizzes	5%

Grading Policy

To determine the average needed to ensure that you obtain the grade that you want in this course, consult the table that follows.

Average	Grade
89.5 and above	A
79.5 to 89.5	B
69.5 to 79.5	C
59.5 to 69.5	D
below 59.5	F

Homework Policy

Homework sets will be assigned for every lesson and will account for 35% of the final grade. Please consult the course calendar to see each assignment's due date. Late assignments will not be accepted. Please be sure to include the work needed to obtain your solutions and do not simply include answers. If you have trouble completing a homework assignment, please contact me for assistance before it is due. I will try to answer emails within the hour that I first view them during normal business hours.

Unit Projects

There will be 6 unit projects in this course that will account for 40% of the final grade. You are expected to do a professional job on these projects submitting typed final reports (where possible) that are neat, thorough, mathematically correct, and grammatically correct.

Final Project

The final project will require you to create an activity, experiment, or project for each of the first five units of this course for the students that you teach. The goal is for the students to engage in a significant activity and obtain a feel for how mathematics can be used in real-world situations. Again, you are expected to do a professional job on the final project and submit a typed final report that is neat, thorough, mathematically correct, and grammatically correct. The final project will account for 20% of the final grade.

Check-in Quizzes

There will be regular “check-in quizzes” that will appear in Blackboard. These are simple checks on how the class is going to help me keep up with class progress and temperament. The average of the these quizzes will account for 5% of the final grade.

Student Responsibilities

The student is *solely* responsible for:

- Completing each assignment by the specified due date.
- 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.

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 found on page 96 of the [Student Handbook](#)ⁱⁱⁱ.

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](#).^{iv} 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](#)^v for more information.

Plagiarism

Plagiarism is a serious topic covered on pages 18, 19, and 137 in ASU's [Student Handbook](#)^{vi}. 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](#).^{vii}

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](#)^{viii} 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](#)^{ix}

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](#).^x

Information About COVID-19

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

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](#)^{xii}
 - [Angelo State University Catalog](#)^{xiii}
- 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.
- Good luck. I sincerely hope you do well in this course, and I strongly encourage you to use me as a resource outside of class to help you succeed.

All items contained in this syllabus are subject to change as the semester progresses. Students will be notified in advance of any changes.

Mathematics 6320 – Mathematical Modeling for Educators Student Learning Outcomes

1. **Students will demonstrate factual knowledge including the mathematical notation and terminology used in this course.** Students will be able to demonstrate an understanding of the basic terminology and concepts that are associated with mathematical modeling including but not limited to equilibrium values, qualitative modeling, quantitative modeling, interpolation, difference equations, differential equations, model fitting, geometric similarity.
2. **Students will describe the fundamental principles including the laws and theorems arising from concepts covered in this course.** Students will discuss features of models including relationships between the variables, long-term behavior of the model, and an analysis of equilibrium values.
3. **Students will apply course material along with procedures and techniques covered in this course to solve problems.** Students will be able to create and analyze discrete and continuous models for real-world phenomena.
4. **Students will develop specific skills, competencies, and thought processes sufficient to support further study or work in this field or related fields.** Students will collect data, create a model based on that data, and produce a high-quality technical document incorporating an analysis of the model with results from Octave and Excel.

Content

Content consists of the following topics, listed according to the corresponding chapters in the text. (See textbook "Contents.")

1. **Modeling with Difference Equations:** introduction to difference equations, applying difference equations in modeling, solving dynamical systems, systems of dynamical systems

2. **Modeling Process, Proportionality, and Geometric Similarity:** modeling process, proportionality, geometric similarity, applications of proportionality and geometric similarity
3. **Model Fitting:** graphical model fitting, Chebyshev and least-squares criterion, applications of least-squares criterion
4. **Experimental Modeling:** one-term models and the ladder of powers, high-order polynomial models, transcendental models
5. **Simulation Modeling:** simulating random events, simulating probabilistic behavior, estimating area and definite integrals
11. **Modeling with Differential Equations:** exponential growth and decay, applications of exponential growth and decay, graphical solutions of differential equations, numerical approximation methods

Anticipated Daily Schedule

The table indicates the assignment that will be due on the date listed. All course materials will be available from the beginning of the course and assignments can be completed early; however, late assignments will not be accepted. All assignments, handouts, and the course calendar can be accessed in Blackboard.

Day	Assignment Due
June 7	Intro 1
June 8	Check-in Quiz 1
June 9	Unit 1-1
June 12	Unit 1-2
June 14	Unit 1-3
June 16	Unit 1-4
June 19	Unit 2-1
June 21	Unit 1 Project
June 22	Check-in Quiz 2
June 23	Unit 2-2
June 26	Unit 2-3
June 28	Unit 3-1
June 30	Unit 2 Project
July 5	Unit 3-2
July 6	Check-in Quiz 3
July 7	Unit 3-3
July 10	Unit 3-4
July 12	Unit 4-1
July 14	Unit 3 Project
July 17	Unit 4-2
July 19	Unit 4-3
July 20	Check-in Quiz 4
July 21	Unit 5-1
July 24	Unit 4 Project
July 26	Unit 5-2
July 28	Unit 5-3
July 31	Unit 6-1
August 2	Unit 5 Project
August 3	Check-in Quiz 5

Day	Assignment Due
August 4	Unit 6-2
August 7	Unit 6-3
August 9	Unit 6-4
August 12	Unit 6 Project / Final Project

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- ⁱ Virtual Office Hours: <https://us.bbcollab.com/guest/7c7a9aeafd7d40e5ae3d34f243be5483>
- ⁱⁱ Blackboard Link: <http://blackboard.angelo.edu>
- ⁱⁱⁱ Student Handbook: <https://www.angelo.edu/current-students/student-handbook/>
- ^{iv} Disability Services: <https://www.angelo.edu/current-students/disability-services/>
- ^v Grading Procedures: <https://angelo.policystat.com/policy/10659448/latest/>
- ^{vi} Student Handbook: <https://www.angelo.edu/current-students/student-handbook/>
- ^{vii} Writing Center: https://www.angelo.edu/current-students/writing-center/academic_honesty.php
- ^{viii} Religious Holy Day Observance: <https://angelo.policystat.com/policy/10659231/latest/>
- ^{ix} Incident Reporting Form: <https://www.angelo.edu/incident-form>
- ^x Title IX: <https://www.angelo.edu/title-ix>
- ^{xi} COVID-19 Updates: <https://www.angelo.edu/covid-19/>
- ^{xii} Student Handbook: <https://www.angelo.edu/current-students/student-handbook/>
- ^{xiii} University Catalog: <http://www.angelo.edu/catalogs/>