Syllabus: Math 3324 - 010
Applied Mathematics for Engineers
Spring, 2021

Instructor Information
Dr. Andrew J. Siefker
Office: MCS 219B
Phone: 486 - 5440 (office)
Email: andrew.siefker@angelo.edu
Office Hours: M: 9:00 – 9:45 a.m.; 11:00 – 11:30 a.m.; 2:30 – 4:30 p.m.
T: 11:00 – 11:30 a.m.; 2:00 – 3:30 p.m.
W: 9:00 – 9:45 a.m.; 11:00 – 11:30 a.m.
Th: 11:00 – 11:30 a.m.; 2:30 – 4:30 p.m.
F: 9:00 – 9:30 a.m.; 11:00 – 11:30 a.m.

or by appointment. I will be online via Blackboard by appointment only.

Major Course Requirements
Prereqs: Mathematics 2313 and 2314 or Mathematics 2413 and 2414.
Grading:
• Exams .............................. 22% x 4.
• Homework and Quizzes .......... 12% (drop lowest 3).
• Final Exam ........................ Monday, May 10 at 10:30 a.m.;
  score < 60% drop a letter grade, score ≥ 90% increase a letter grade.

Note: I reserve the right to adjust the grading scheme and grading scale for an individual or the class as warranted. Please note that ASU’s interpretation of federal law (Buckley amendment) prohibits me from relaying your grades via phone or email.

Attendance: Attendance will be taken.

April 30, 2021: LAST DAY TO DROP A CLASS OR WITHDRAW FROM ASU

Disclaimer
This syllabus is current and accurate as of its posting date and will not be updated. Also, the subject matter schedule listed below is tentative, and subject to change and adaptation. For up-to-date course information, contact the instructor.
**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. Also, you will have assigned seating which, once determined, will not change.

When you are not in the physical class, you will attend live remote sessions at the same time as our scheduled course. You will also be expected to complete coursework via Blackboard.¹

Please refer to this Health and Safety web page² for updated information about campus guidelines as they relate to the COVID-19 pandemic.

**Tutoring and the Math Lab:**

A tutor will be assigned to this course. The tutor will introduce themselves to the class, send regular reminders of their tutoring times, and set up reviews. The tutor will set up 3 online tutoring sessions each week.

The tutoring sessions for all tutors will be made public to allow students more options with respect to tutoring times. Students can visit any online session dedicated to their subject that they wish.

In addition to the online tutoring that will be available, walk-in help will be available in the Math Lab from 1 p.m. to 5 p.m. Monday through Friday. There is no Sunday evening walk-in lab this semester, so you may want to work with the tutor attached to your class to arrange for evening options on Sunday or other days of the week.
Course Policies:

Homework and Quizzes:
Homework is regularly collected and quizzes may be administered. When collected, homework is due when the instructor requests it (usually at the beginning of class.) Late homework is not accepted and receives a grade of ZERO. When given, quizzes count as a homework score and NO MAKE-UP QUIZZES will be given. You must show complete solutions (i.e. all steps and calculations) and write LEGIBLY to receive credit for any problem.

Homework turned in for a grade must follow a specific template. (1) Write the problems in numerical order, in a single column, using only one side of a sheet of paper. (2) Staple multiple sheets of paper together in the upper, left-hand corner. Be certain the problems are in numerical order. (3) Fold your homework longwise so that it opens like a book. Write your name, the course (e.g. Math 1342) and course time (e.g. 9 am), and the homework section number.

Examinations:

You must show complete solutions (i.e. all steps and calculations) and write LEGIBLY to receive credit for any “essay” problem. Scrap paper will be provided upon request; you may not use your own. If you miss or will miss an exam, contact the instructor ASAP. NO MAKE-UP EXAMS will be administered, and the use of calculators is at the discretion of the professor.

Grades:

All grades become final one week after the grade is recorded. Therefore, any questions you may have regarding a grade must be resolved before this one week deadline.

Class Etiquette:

Please be courteous of others in the class including: not utilizing cell phones, silencing cell phones, not habitually arriving late, not leaving during lectures (unless you notify me beforehand), not engaging in non-math related conversations or activities, etc. All students are required to follow the policies and procedures presented in these documents:

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 of 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:

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 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.

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.

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, or become aware 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 here11 24/7 or 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.12

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.

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.
Student Responsibilities:

1. Students are responsible for the policies and procedures delineated in this syllabus. Failure to abide by these policies and procedures may result in failing the course.

2. If you miss class for any reason, *even for University-sponsored activities*, it is your responsibility to have your assignments submitted on time or ahead of time if necessary. You are also responsible for preparing for the next class. This includes obtaining assignments, announcements, and notes FROM A CLASSMATE.

3. The main keys to success in this course are as follows:
   a. Attending class regularly.
   b. Reading the book and working through the examples.
   c. Taking good notes.
   d. Completing all assignments in a timely manner.
   e. Not falling behind.
   f. Reviewing the material on a regular basis. Studying for this course at least 6 hours per week (more if needed) is what is recommended by learning researchers and is what I expect of you. AT LEAST SEVENTY-FIVE PERCENT OF YOUR LEARNING IS SELF-STUDY.
Some Things to Consider About College Mathematics Courses:

1. **Responsibility** – Though guided by your instructors and advisors, YOU are responsible from now on for your own education. SEVENTY-FIVE PERCENT OF YOUR LEARNING IS SELF-STUDY.

2. **Peer Group** – Most of you are no longer well above the majority of your classmates. You are in a new environment with people whose abilities are much like your own.

3. **Level of Learning** – The primary goals of a university education are three-fold: 1) to learn essential **thinking skills** so that when you encounter a new or unfamiliar situation you can analyze the problem and carry out the necessary steps to solve it. This is especially important in mathematics since many courses require a mathematical background and expect you to use the material you have studied. 2) to **learn how to learn** on your own, i.e. how to teach yourself through reading, study, discussion, and contemplation. 3) to **develop an appreciation** for topics not directly related to employment. Students who do poorly in college mathematics courses are typically those who fall behind in their work, overestimate their effort, or insist on high-schoolish modes of learning.

4. **Roles of Students and Instructors** – The instructor's role is to guide the students' learning process. It is NOT to cover all aspects of every topic for every student. Students are expected to read the textbook, to learn some material on their own, and to fill in any gaps in their mathematical background. It is not uncommon in college mathematics courses that MUCH OF YOUR LEARNING WILL TAKE PLACE OUTSIDE THE CLASSROOM. You should plan to devote at least two hours outside the classroom for every hour of classroom instruction. Teaching and learning in college is a cooperative effort shared by the instructor and the student.

5. **Exams** – Class work and homework are intended to guide you in your task of gaining command of the material covered in this course. This DOES NOT MEAN that the examples you see will be exactly (or essentially) the same as the questions asked on exams. You are expected to prepare yourself for tests and the final exam. If you UNDERSTAND THE MATERIAL to the point where you can apply it to pertinent situations, you will do well on exams. If you concentrate on memorization and ad-hoc methods for particular problems, you will probably struggle on exams. There will be no review sessions or elaborate practice sheets to prep you for a test or final exam.
Student Learning Outcomes
Mathematics 3324 – Applied Mathematics for Engineering

1. **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 symbolism of differential equations and linear algebra.

2. **Students will be able to describe the fundamental principles arising from the concepts in this course.** Students will demonstrate familiarity with the concepts that follow from the fundamental concepts; for example, existence of solutions to differential equations, properties of matrices and vectors, properties of vector spaces and subspaces.

3. **Students will be able to apply the course material to solve problems.** Students will use the facts, formulas, and techniques to solve first and second order differential equations and systems of differential equations, and to manipulate matrices and vectors.

4. **Students will develop specific skills, competencies and reasoning abilities to support further study or work in this or related fields.** Students will acquire a level of proficiency in the fundamental concepts and applications necessary for further study in engineering.

Course Content

Textbook: *Differential Equations and Linear Algebra* by Edwards, Penney, and Calvis. Content consists of the following topics, listed according to the corresponding chapters in the text. (See textbook “Contents.”)

- **Chapter 1 – First-Order Differential Equations:** Differential equations and models, techniques for finding solutions, slope fields and solution curves.
- **Chapter 2 – Mathematical Models and Numerical Methods:** Population models, acceleration-velocity models, qualitative features of models, approximating solutions.
- **Chapter 3 – Linear Systems and Matrices:** Definition of matrices, Gaussian elimination, row-echelon and reduced row-echelon forms, matrix operations, inverses of matrices, determinants.
- **Chapter 4 – Vector Spaces:** Definition, subspaces, linear independence, bases and dimension, row and column space.
- **Chapter 5 – Higher-Order Linear Differential Equations:** General solutions of linear equations, homogeneous equations with constant coefficients, mechanical vibrations, nonhomogeneous equations.
- **Chapter 6 – Eigenvalues and Eigenvectors:** Definition and methods for finding eigenvalues and eigenvectors, diagonalization of matrices.
- **Chapter 7 – Linear Systems of Differential Equations:** First-order systems and applications, matrices and linear systems, the eigenvalue method for linear systems.
Required Texts or Readings:

Technically, no text is required; however, most homework problems will come from the textbook. Also, the text explains the material well and is full of examples. Therefore, having the textbook is HIGHLY recommended. In my opinion, not having the textbook will greatly hamper your learning.

Subject Matter Schedule

The subject matter schedule listed below is tentative, and subject to change and adaptation. For current, updated information about course topics, contact the instructor.

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