Math 3335: Differential Equations
Course Syllabus

This syllabus is current and accurate as of its posting date, but it will not be updated. For the most complete and up-to-date course information, contact the instructor.

Contact Information

Instructor: Dr. Dennis Hall
Office: MCS 220J
Office Hours: M&F: 12:00-1:00; W: 9-10,2-3; T&Th 11:00-12:30, 2-3; and by appointment
E-mail: dennis.hall@angelo.edu
Phone: 325-486-5426

Course Information

Course Description: Solution of differential equations, with geometric and physical applications.


Course Content: The following chapters and topics will be covered.


2. First Order Differential Equations. Linear equations, integrating factors, separable equations, differences between linear and nonlinear equations, autonomous equations and population dynamics, exact equations and integrating factors, Euler’s method, the existence and uniqueness theorem.

3. Linear Second Order Differential Equations. Homogeneous equations with constant coefficients, fundamental solutions, linear independence and the Wronskian, complex roots of the characteristic equation, repeated roots, reduction of order, nonhomogeneous equations and undetermined coefficients, variation of parameters, applications.


6. **The Laplace Transform.** Definition and properties, solution of initial value problems, step functions, discontinuous forcing functions, impulse functions.

7. **Systems of First Order Linear Equations:** Review of linear algebra, homogeneous linear systems with constant coefficients, complex eigenvalues, repeated eigenvalues.

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**Course Evaluation**

Your grade for this course will be determined by your performance on exams and homework. Final grades will be based on a standard 10-point grading scale.

**Tests (70%):** There will be four tests throughout the semester. These tests are closed-book, paper tests that will last an entire class period. The lowest of your three test scores will count 10% of your final grade, while the three highest will each count 20% of your final grade. If you miss one test for any reason, that test’s grade will be replaced by the final exam grade. Any tests missed after the first will receive a grade of zero. **There will be no make-up tests.**

**Final Exam (20%):** In addition to the tests above, there will be a comprehensive final examination on Monday, May 6 from 10:30am – 12:30pm. That final exam will count for 20% of your final grade.

**Homework (10%):** Homework sets will be assigned most days and will typically be due by the next class. You are free to receive help on homework from any source: me, students, solutions manuals, online, etc. However, it is encouraged that you work the homework on your own first, since this will be the best way to practice for tests. Work must be shown on homework to receive credit.

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**Other Information**

**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.

**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.

**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 Statement of Academic Integrity

**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. Sex discrimination, sexual misconduct, public indecency, interpersonal violence, sexual assault, sexual exploitation, sexual harassment, and stalking are not tolerated at ASU. As a faculty member, I am a Responsible Employee meaning that I will report any allegations I am notified of to the Office of Title IX Compliance in order to connect students with resources and options in addressing the allegations reported. You are encouraged to report any incidents to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator. You may do so by contacting:

Michelle Boone, J.D.

Director of Title IX Compliance/Title IX Coordinator

Mayer Administration Building, Room 200
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.

The Office of Title IX Compliance also provides accommodations related to pregnancy (such as communicating with your professors regarding medically necessary absences, modifications required because of pregnancy, etc.). If you are pregnant and need assistance or accommodations, please contact the Office of Title IX Compliance utilizing the information above.

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

Student Disability Services:

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.

The Office of Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student’s responsibility to initiate such a request by contacting:

Ms. Dallas A. Swafford

Director of Student Disability Services
325-942-2047
Dallas.swafford@angelo.edu
Houston Harte University Center
**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 via Turnitin. Resources to help you understand this policy better are available at the ASU Writing Center.

**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](#)

**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 Learning Outcomes**

The student will demonstrate factual knowledge including the mathematical notation and terminology used in this course. Students will read, interpret, and use the vocabulary, symbolism, basic definitions used in numerical analysis including those related to topics learned in calculus and algebra and revisited in this course; limits, continuity, numerical integration, numerical differentiation, ordinary differential equations, and polynomial interpolation.

The students will describe the fundamental principles including the laws and theorems arising from the concepts covered in this course. Students will identify and apply the properties and theorems that result directly from the definitions as well as statements discovered in calculus and extended in this course; for example, Rolle’s Theorem, Mean Value Theorem, Intermediate Value Theorem, Taylor’s Theorem, theorems on convergence and existence and their error terms.

The students will apply course material along with techniques and procedures covered in this course to solve problems. Students will use the facts, formulas, and techniques learned in this course to develop and use algorithms and theorems to find numerical solutions and bounds on their error to various types of problems including root finding, polynomial approximation, numerical differentiation, numerical integration.

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 gain the ability to use a software package such as MATLAB to solve numerical problems and acquire a level of proficiency in the fundamental concepts and applications necessary for further study in academic areas requiring numerical analysis as a prerequisite for graduate work or for work in occupational fields. These fields might include further study in mathematics, engineering, computer science, or the physical sciences.
Course Schedule

Weekly Schedule

Below is a tentative schedule, but it is likely to change throughout the semester.

Week 1: 1.1,1.3,2.1
Week 2: 2.2,2.3,2.4
Week 3: 2.5,2.6,2.7
Week 4: Test 1, 3.1,3.2
Week 5: 3.3,3.4,3.5
Week 6: 3.6,3.7,4.1,4.2
Week 7: 4.3,4.4, Test 2
Week 8: 5.1,5.2,5.4
Week 9: 5.5,6.1,6.2
Week 10: 6.3,6.4,6.5
Week 11: Test 3,7.1
Week 12: 7.2,7.3
Week 13: 7.4,7.5
Week 14: 7.6, Test 4
Week 15: 7.8, Review
Week 16: Final Exam (May 6, 10:30-12:30)

Important Dates

January 14: First day of class
January 21: No Class (MLK Day)
March 11 – March 15: No Class (Spring Break)
March 28: Last day to drop a class
May 6: Final Exam (10:30-12:30)