

Syllabus of Differential Equations MATH 3320

Spring 2026

Instructor: Dr. Kun Gou (associate professor of Mathematics), [university website of Dr. Gou](#)

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Office: Classroom Hall 220

Office hours: Tuesday and Thursday: 11am-12pm, 2-3pm, or appointment based if other time is needed

Class meeting time and location: Tuesday and Thursday 9:30-10:45 pm, Classroom Hall 219.

Course description: The ordinary differential equations of physics, chemistry, and engineering; methods for their solutions and the properties of their solution.

Prerequisite: MATH 2314, MATH 2114 with a grade of “C” or higher. You are expected to be familiar with single and multi-variable calculus, and linear algebra. You should be able to work out second derivatives of all elementary functions, to use derivatives in real world problems interpreting the derivative as rate of change, to interpret integral as net area and total change, to evaluate the integrals using various integration techniques, to have a basic understanding about differential equations, to apply these concepts in multi-variable situations, to understand the concept of linearity and eigenvalues and eigenvectors of matrices.

Required textbook: Elementary Differential Equations and Boundary Value Problems, 12th Edition, by William E. Boyce, Richard C. DiPrima, and Douglas B. Meade. E-text will be used through WileyPLUS Platform. Purchasing a hard copy of the textbook is optional.

Online platform: Wileyplus with electronic textbook. Homework will be given online at Wileyplus. Log into Blackboard Ultra. Go to Content first. And then find Wiley Course Resource.

Student learning objectives: There are two main course goals: to prepare you mathematically for your major courses and to develop your critical thinking, communication, technology, and teamwork skills. Your objectives by the end of this course are that you will be able to:

- Understand and apply the concept of differential equations in real-life situations.
- Solve certain types of differential equations and systems using analytic methods.
- Analyze a differential equation or system qualitatively without necessarily solving..
- Explain mathematical solutions in a coherent way so that your solutions are understandable to a reader who has not solved the problem herself/himself.

List of topics: Topics to be covered include but are not limited to the following (20 sections):

- Chapter 1 Introduction (Sections 1.1-1.3)
 - 1.1 Some Basic Mathematical Models; Direction Fields
 - 1.2 Solutions of Some Differential Equations
 - 1.3 Classification of Differential Equations
- Chapter 2 First Order Differential Equations (Sections 2.1-2.8)
 - 2.1 Linear Equations; Method of Integrating Factors
 - 2.2 Separable Equations
 - 2.3 Modeling with First Order Equations

- 2.4 Differences Between Linear and Nonlinear Equations
- 2.5 Autonomous Equations and Population Dynamics
- 2.6 Exact Equations and Integrating Factors
- 2.7 Numerical Approximations: Euler's Method
- 2.8 The Existence and Uniqueness Theorem
- Chapter 3 Second Order Linear Equations (Sections 3.1-3.6)
 - 3.1 Homogeneous Equations with Constant Coefficients
 - 3.2 Fundamental Solutions of Linear Homogeneous Equations; The Wronskian
 - 3.3 Complex Roots of the Characteristic Equation
 - 3.4 Repeated Roots; Reduction of Order
 - 3.5 Nonhomogeneous Equations; Method of Undetermined Coefficients
 - 3.6 Variation of Parameters
- Chapter 6 The Laplace Transform (Sections 6.1-6.3)
 - 6.1 Definition of the Laplace Transform
 - 6.2 Solution of Initial Value Problems
 - 6.3 Step Functions

(The instructor reserves the right to modify/update the topics as appropriate.)

Grading policy: Final grades will be based on two midterm tests, HWs, attendance, and the final exam. The final exam will be comprehensive. The final exam grade is used to replace the lowest midterm grade if it is lower than the final exam grade. Ratios are: tests 30%, HW 35%, attendance 5%, and final 30%.

Grading scale: Use T to represent the total weighted point in a 100 scale for a student. The grading scale in a letter grade is: $T \geq 90$, A grade; $T \geq 80$, B grade; $T \geq 70$, C grade; $T \geq 60$, D grade; $T < 60$, F grade.

HW policy: 30% score reduction will be applied to work submitted within 3 days after due date. 50% score reduction will be applied to work submitted 3 days after due date.

Midterm test extension policy: Tests can only be rescheduled for a later date in case of student illness, family issues, attending University events, or other significant cases approved by the instructor. An official document is required for the excuse. Students need to inform the instructor about the circumstances and negotiate the day of the makeup. Notice to the instructor for make-up after the regular test time is not acceptable. Makeup cannot be made 5 weekdays later than the regular test date.

Suggested Learning Strategy: Be advised that college math requires much initiative from the students to not only really remember the principles, but also understand the theory, and finally apply it to solve abstract/practical problems independently. So be hard-working to read and understand the class-notes and textbook. If you have a wrong problem in a HW, test, or quiz, understand why, and know the right way to solve it. Feel free to talk to your instructors in their office hours, and use the online platform to self-learn if necessary. Solve the problem; don't accumulate it. In summary:

- Review the class notes regularly.
- Read the textbook to enhance understanding (more detailed materials).
- Finish homework on time. Don't wait to the last minute to do it. Understand the solutions and reasoning behind. If there are wrong solutions, understand why your solutions are wrong and how to find the correct ones.

- Discuss with your instructor or classmates for difficult concepts.
- Only you yourself deeply know if your study is enough or not. Take action to strengthen yourself in learning effect. Aside from the regular class time each week, you should devote at least 6-8 hours weekly to studying on your own.

Suggested preparation for mid-term exams and the final exam:

- Review all our class notes, and deeply understand the materials before the tests.
- Also try to work out the examples in the notes and compare your answers with the answers in the notes.
- Many test problems will be like HW or classnote problems. Please understand the HW problems deeply and make sure you can work out the problems correctly without resorting to the help resources.
- You can practice extra problems for the sections covered in the test in Wileyplus.
- Check your solution carefully before you write your answer to make sure it is right by your understanding.
- Pay attention to the detail. Follow the requirement of the answer format like how many decimal places are needed.

Civility in the classroom: Students are expected to be supportive and encouraging to other students to help create a positive learning environment. Thus, I respectfully ask that you do not use cell phones, laptops, or other electronic devices in class for any non-course related purposes. Please do not send or read text messages or emails; please do not surf the web. Doing so is distracting to you, to the instructor, and to your fellow students. Please make every effort to avoid situations that require you to leave before the end of class. However, if you must leave class early, please inform your instructor in advance.

Instructor's commitment to academic honesty and integrity: Your instructor is sympathetic to the pressures faced by many students (e.g., full time employment, family responsibilities), and will do his best to provide anyone with any assistance you may need to succeed in this course. He is also committed to awarding grades based on students' honest efforts. Therefore, your instructor will accept no excuses for any form of academic misconduct. All incidents of suspected academic dishonesty will be investigated and fully pursued permitted by university policy.

Texas A&M University San Antonio Important Policies and Resources



**TEXAS A&M UNIVERSITY
SAN ANTONIO**

University Email Policy and Course Communications

All correspondence between professors and students must occur via university email accounts. You must have your Jaguar email account ready and working. If it is not working, contact the help desk at

helpdesk@tamusa.edu or at 210-784-HELP (4357). If you don't hear back within 48 hours, contact them again. They have many requests during the first part of the semester, so you may need to follow up with them.

Academic Accommodations for Individuals with Disabilities

Texas A&M University-San Antonio is committed to providing all students with reasonable access to learning opportunities and accommodations in accordance with The Americans with Disabilities Act, as amended, and Section 504 of the Rehabilitation Act. If you experience barriers to your education due to a disability or think you may have a disability, Disability Support Services is in the Central Academic Building, Suite 210. You can also contact us via phone at (210) 784-1335, visit us at the website or email us at dss@tamusa.edu. Disabilities may include, but are not limited to, attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their academic accommodation with Disability Support Services and their instructors as soon as possible.

Academic Learning Center

All currently enrolled students at Texas A&M University-San Antonio can utilize the Academic Learning Center for subject-area tutoring. The Academic Learning Center provides free course-based tutoring to all currently enrolled students at Texas A&M University-San Antonio. Students wishing to work with a tutor can make appointments through the Brainfuse online tutoring platform. Brainfuse can be accessed in the Tools section of Blackboard. You can contact the Academic Learning Center by emailing tutoring@tamusa.edu, calling (210) 784- 1307, or visiting the Central Academic Building, room 202. Online tutoring is also available for after hours and weekend assistance.

While tutoring hours may change based on tutor schedules and availability, the current tutoring hours for MATH in the ALC are as follows:

Day of the Week	Appointments Available	Walk-in Tutoring (no appointment needed)
Monday	8:00 AM – 6:00 PM	9:00 AM – 5:00 PM
Tuesday	8:00 AM – 6:00 PM	9:00 AM – 5:00 PM
Wednesday	8:00 AM – 6:00 PM	9:00 AM – 5:00 PM
Thursday	8:00 AM – 6:00 PM	9:00 AM – 5:00 PM
Friday	8:00 AM – 5:00 PM	11:00 AM – 4:00 PM

Counseling/Mental Health Resources

As a college student, there may be times when personal stressors interfere with your academic performance and negatively impact your daily functioning. If you are experiencing emotional difficulties or mental health concerns, support is available to you through the Student Counseling Center (SCC). To schedule an appointment, visit our website, call 210-784-1331 or visit Madla 120 between the hours of 8:00 AM and 5:00 PM.

All mental health services provided by the SCC are free and confidential (as the law allows). The Student Counseling Center provides brief individual and group therapy, crisis intervention, consultation, case

management, and prevention services. Crisis support is available 24/7/365 by calling the SCC at 210-784-1331 or through the TELUS student support App.

The [TELUS Student Support App](#) provides a variety of mental health resources to include 24/7/365 support for in the moment distress, crisis support, an anonymous peer-to-peer support network, mental health screenings, podcasts, and articles to improve your mental wellbeing.

Emergency Preparedness

JagE Alert is Texas A&M University-San Antonio's mass notification system. In the event of an emergency, such as inclement weather, students, staff and faculty, who are registered, will have the option to receive a text message, email with instructions and updates. To register or update your information visit the [Jag E Alert System website](#). You can access more information about [Emergency Operations Plan and the Emergency Action Plan on our website](#). Download the [SafeZone App](#) for emergencies or call (210) 784-1911. Non-Emergency (210) 784-1900.

Financial Aid and Verification of Attendance

According to the following federal regulation, 34 CFR 668.21: U.S. Department of Education (DoE) Title IV regulation, a student can only receive Title IV funds based on Title IV eligibility criteria which include class attendance. If Title IV funds are disbursed to ineligible students (including students who fail to begin attendance), the institution must return these funds to the U.S. DoE within 30 days of becoming aware that the student will not or has not begun attendance. Faculty will provide the Office of Financial Aid with an electronic notification if a student has not attended by the published Census Date (the first week of class). Any student receiving federal financial aid who does not attend prior to the published Census Date (the first week of class) will have their aid terminated and returned to the DoE. Please note that any student who stops attending at any time during the semester may also need to return a portion of their federal aid.

Jaguar Writing, Language, and Digital Composing Center (WLDCC)

The Jaguar Writing Center provides writing support to graduate and undergraduate students in all three colleges as well as faculty and staff. Writing tutors work with students to develop reading skills, prepare oral presentations, plan, draft, and revise their written assignments. Our language tutors support students enrolled in Spanish courses and students composing in Spanish for any assignment. Our digital studio tutors support students working on digital projects such as e-portfolios, class presentations, or other digital multimedia projects.

The Writing Center offers face-to-face, synchronous online, and asynchronous digital appointments. Students can schedule appointments with the Writing Center in JagWire under the **Student Services tab**. Click on **Writing, Language, and Digital Composing Center** to make your appointment. Students wanting to work in real time with a tutor can schedule an **Online Appointment**. Students wishing to receive asynchronous, written feedback from a tutor can schedule an **e-Tutoring appointment**. More information about what services we offer, how to make an appointment, and how to access your appointment can be

found on the [Writing Center's website](#). The Writing Center can also be reached by emailing: writingcenter@tamusa.edu.

Meeting Basic Needs

Any student who has difficulty affording groceries or accessing sufficient food to eat every day or who lacks a safe and stable place to live and believes this may affect their performance in the course, is urged to [submit a CARE report for support](#). Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to direct you to available resources. The [General's Store is a food pantry](#) that is available on campus as well.

Military Affairs

Veterans and active-duty military personnel are welcomed and encouraged to visit the Office of Military Affairs for any question involving federal or state VA Education Benefits. Visit the Patriots' Casa building, room 202, or to contact the Office of Military Affairs with any questions at military.va@tamusa.edu or (210)784-1397.

Religious Observances

Texas A&M University-San Antonio recognizes the wide variety of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided with an opportunity to make up any examination, study, or course work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes.

The Six-Drop Rule

Students are subject to the requirements of Senate Bill (SB) 1231 passed by the Texas Legislature in 2007. SB 1231 limits students to a maximum of six (6) non-punitive course drops (i.e., courses a student chooses to drop) during their undergraduate careers. A non-punitive drop does not affect the student's GPA. However, course drops that exceed the maximum allowed by SB 1231 will be treated as "F" grades and will impact the student's GPA.

Statement of Harassment and Discrimination

Texas A&M University-San Antonio is committed to the fundamental principles of academic freedom, equal opportunity, and human dignity. To fulfill its multiple missions as an institution of higher learning, A&M-San Antonio encourages a climate that values and nurtures collegiality and the uniqueness of the individual on our campus and within our state, nation, and world. All decisions and actions involving students and employees are to be based on applicable law and individual merit. Texas A&M University-San Antonio, in accordance with applicable federal and state law, prohibits discrimination, including harassment, based on race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, or pregnancy/parenting status. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the University's Civil Rights Officer at 210-784-2061 or titleix@tamusa.edu. Texas A&M University-San Antonio faculty are committed to providing a safe learning environment for all students and for the university. If you have experienced any

form of sex discrimination or harassment, including sexual assault, sexual harassment, domestic or dating violence, or stalking based on sex, know that help and support are available. A&M-San Antonio's Title IX Coordinator can support those impacted by such conduct in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. The university strongly encourages all students to report any such incidents to the Title IX Coordinator. Please be aware that all A&M-San Antonio employees (other than those designated as confidential resources such as counselors and trained victim advocates) are required to report information about such discrimination and harassment to the university. This means that if you tell a faculty member about a situation of sexual harassment, sexual violence, or other related sex-based misconduct, the faculty member must share that information with the university's Title IX Coordinator (titleix@tamusa.edu, 210-784-2061, CAB 439K). If you wish to speak to a confidential employee who does not have this reporting requirement, you can contact the Student Counseling Center at (210) 784-1331 or visit them in Madla 120.

Pregnant/Parenting Students

Texas A&M-San Antonio does not require a pregnant or parenting student, solely because of that status or issues related to that status, to (1) take a leave of absence or withdraw from their degree or certificate program; (2) limit the student's studies; (3) participate in an alternative program; (4) change the student's major, degree, or certificate program; or (5) refrain from joining or cease participating in any course, activity, or program at the University. The university will provide reasonable accommodation for pregnant students as it would be provided to a student with a temporary medical condition that is related to the health and safety of the student and the student's unborn child. These could include maintaining a safe distance from substances, areas, and activities known to be hazardous to pregnant individuals and their unborn child; excused absences because of illness or medical appointments; modified due dates for assignments; rescheduled tests/exams; taking a leave of absence; and being provided access to instructional materials and video recordings of lectures for excused absences, if these would be provided to any other student with an excused absence. Pregnant/parenting students are encouraged to contact the Title IX Coordinator with any questions or concerns related to their status (titleix@tamusa.edu; 210-784- 2061; CAB 439K).

Texas A&M-San Antonio has also designated the Title IX Coordinator as the liaison officer for current or incoming students who are the parent or guardian of a child younger than 18 years of age. The Title IX Coordinator can provide students with information regarding support services and other resources. Young Jaguars can support parenting students with daycare if students meet this criteria: (1) must be enrolled in classes at Texas A&M-San Antonio in the current semester, (2) must be Pell eligible or a single parent, (3) child(ren) must be aged 3 to 12-years-old, and (4) child(ren) must be enrolled in Pre-K-3 through 6th grade. For more information, please contact Young Jaguars at youngjaguars@tamusa.edu or call (210) 784-2636.

Students' Rights and Responsibilities

The following statement of students' rights and responsibilities is intended to reflect the philosophical base upon which University Student Rules are built. This philosophy acknowledges the existence of both rights and responsibilities, which is inherent to an individual not only as a student at Texas A&M University-San Antonio but also as a citizen of this country.

Students' Rights

1. A student shall have the right to participate in a free exchange of ideas, and there shall be no University rule or administrative rule that in any way abridges the rights of freedom of speech, expression, petition and peaceful assembly as set forth in the U.S. Constitution.
2. Each student shall have the right to participate in all areas and activities of the University, free from any form of discrimination, including harassment, on the basis of race, color, national or ethnic origin, religion, sex, disability, age, and pregnancy/parenting or veteran status in accordance with applicable federal and state laws.
3. A student has the right to personal privacy except as otherwise provided by law, and this will be observed by students and University authorities alike.
4. Each student subject to disciplinary action arising from violations of university students' rules shall be assured a fundamentally fair process.

Students' Responsibilities

1. A student has the responsibility to respect the rights and property of others, including other students, the faculty, and administration.
2. A student has the responsibility to be fully acquainted with the published University Student Rules found in the Student Handbook, Student Code of Conduct, on our website, and University Catalog, and to comply with them, as well as with federal, state, and local laws.
3. A student has the responsibility to recognize that student actions reflect upon the individuals involved and upon the entire University community.
4. A student has the responsibility to recognize the University's obligation to provide a safe environment for learning.
5. A student has the responsibility to check their university email for any updates or official university notifications.

Students are expected to exhibit a high level of honesty and integrity in their pursuit of higher education. Students engaging in an act that violates the standards of academic integrity will find themselves facing academic and/or disciplinary sanctions. Academic misconduct is any act, or attempt, which gives an unfair advantage to the student. Additionally, any behavior specifically prohibited by a faculty member in the course syllabus or class discussion may be considered as academic misconduct. For more information on academic misconduct policies and procedures please review the [Student Code of Conduct](#) or visit the resources available in the [OSRR website](#).

Important Spring 2026 Dates

Dates	Event
January 13	Tuition and Fee Payments deadline
January 19	Marting Luther King Jr. Day – No Classes
January 20	First Day of Class
February 4	Census Date
March 6-23	Midterm grading period
March 9-14	Spring Break
April 3	Study Day – No classes
April 17	Last day to drop with an automatic withdrawal
May 1	Last day to drop a course or withdraw from the university
May 4	Last Day of Classes
May 5	Study Day – No classes
May 6-12	Final Exams
May 19	Commencement

The complete [Academic Calendar](#) as available on our website.

Artificial Intelligence Policy

Use of Generative AI Permitted Under Some Circumstances or With Explicit Permission: There are situations and contexts within this course where you may be asked to use artificial intelligence (AI) tools to explore how they can be used. Outside of those circumstances, you should not use AI tools to generate content (text, video, audio, images) that will end up in any student work (assignments, activities, discussion responses, etc.) that is part of your evaluation in this course. Any student work submitted using AI tools should clearly indicate with attribution what work is the student's work and what part is generated by the AI. In such cases, no more than 25% of the student work should be generated by AI. If any part of this is confusing or uncertain, students should reach out to their instructor for clarification before submitting work for grading. Use of AI-generated content without the instructor's permission and/or proper attribution in this course qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.

Tentative Schedule

(Subjected to change based on teaching progress)

Days	Content
January 20 Tue	Introduction to Course. WileyPlus setup Chapter 1 Introduction 1.1 Some Basic Mathematical Models; Direction Fields
22 Thur	1.2 Solutions of Some Differential Equations
27 Tue	1.3 Classification of Differential Equations
29 Thur	Chapter 2 First Order Differential Equations 2.1 Linear Equations; Method of Integrating Factors
February 3 Tue	2.2 Separable Equations
5 Thur	2.3 Modeling with First Order Equations
10 Tue	2.4 Differences Between Linear and Nonlinear Equations
12 Thur	2.5 Autonomous Equations and Population Dynamics
17 Tue	2.6 Exact Equations and Integrating Factors
19 Thur	2.7 Numerical Approximations: Euler's Method
24 Tue	2.8 The Existence and Uniqueness Theorem. Review
26 Thur	Test 1 (tentative)
March 3 Tue	Chapter 3 Second Order Linear Equations 3.1 Homogeneous Equations with Constant Coefficients
5 Thur	3.2 Fundamental Solutions of Linear Homogeneous Equations; The Wronskian
10 Tue	3.3 Complex Roots of the Characteristic Equation
12 Thur	3.4 Repeated Roots; Reduction of Order
17 Tue	Spring Break, No Class
19 Thur	Spring Break, No Class
24 Tue	3.5 Nonhomogeneous Equations; Method of Undetermined Coefficients
26 Thur	3.6 Variation of Parameters
31 Tue	Chapter 6 The Laplace Transform 6.1 Definition of the Laplace Transform
April 2 Thur	6.2 Solution of Initial Value Problems
7 Tue	6.3 Step Functions
9 Thur	Review
14 Tue	Review
16 Thur	Review
21 Tue	Test 2 (tentative)
23 Thur	Review
28 Tue	Review
30 Thur	Review
May 5 Tue	Study Day, No Class
6-12	Final Exam (time to be determined)