

# Math 3410: Differential Equations I

Spring 2026 (TR 12:30pm-1:50pm in CHIL 245)

<b>Prerequisite:</b>	MATH 1720 (with a grade of C or better), MATH 2700 recommended (may be taken concurrently).
<b>Textbook:</b>	<i>Elementary Differential Equations and Boundary Value Problems</i> (12th ed.) by Boyce, DiPrima and Meade.
<b>Instructors:</b>	Dr. Jianguo Liu
<b>Office Hours:</b>	TR 11:30am-12:20pm in GAB 451 and W 9am-11am on Zoom (Zoom ID 882 414 5071, students unable to see the instructor during these times may request an appointment.)
<b>Email:</b>	jgliu@unt.edu
<b>Web Page:</b>	Canvas and <a href="http://www.math.unt.edu/~jliu">http://www.math.unt.edu/~jliu</a>

**Course Objectives and Contents:** To provide students with an introduction to the theory of ordinary differential equations through applications, methods of solution, and numerical approximations. Topics include first-order equations, existence-uniqueness theorem, linear equations, separation of variables, higher-order linear equations, systems of linear equations, series solutions and numerical solutions. We will cover most of the following sections:

- 1.2 and 2.1, Introduction and Method of Integrating Factors (Week 1)
- 2.2, Separable Equations (Week 1)
- 2.3, Modeling with First-Order Equations (Week 2)
- 2.4 and 2.7, Linear and Non-linear Equations, Numerical Methods (Week 2)
- 2.6, Exact Equations (Week 3)
- 3.2 and 4.1, The Wronskian and General Theory (Week 3)
- 3.1, Homogeneous Differential Equations (Week 4)
- 3.3 and 3.4, Complex Roots and Repeated Roots (Week 4)
- 3.5, Nonhomogeneous Differential Equations (Week 5)
- 3.6, Variation of Parameters (Week 5)
- 4.2, Higher Order Equations (Week 6)
- Exam 1 Review (Week 6)
- Exam 1 (Week 7)
- 4.3, the Method of Undetermined Coefficients (Week 7)
- 7.1 and 7.2, System of First-Order Equations and Matrices (Week 8)
- 7.3 and 7.4, Eigen-Values, Eigen-Vectors, and Basic Theory (Week 8)

- 7.5, Homogeneous Linear Systems (Week 9)
- 7.6 and 7.8, Systems with Complex and Repeated Eigen-Values (Week 9)
- 7.9, Nonhomogeneous Linear Systems (Week 10)
- 7.7, Fundamental Matrices (Week 10)
- 6.1, The Laplace Transform (Week 11)
- 6.2, Solution of Initial Value Problems (Week 11)
- Exam 2 Review (Week 12)
- Exam 2 (Week 12)
- 5.1, Power Series (Week 13)
- 5.2, Series Solutions Part I (Week 13)
- 5.3, Series Solutions Part II (Week 14)
- Euler Equations (Week 14)
- Review for the Final (Week 15)
- Final exam (Week 16)

**Grading Policy:** Your course grade will be determined by your performance on the homework, the projects, and the exams, subject to the following guidelines:

Homework:	20%
Midterm Exams:	40% (20% each)
Final Exam:	40% (Thursday May 7, 10:00am-12:00pm, CHIL 245)

**Attendance and Participation:** I have great respect for students who are balancing the demands of their coursework with the responsibilities of caring for family members. If you run into challenges that require you to miss a class, please contact me. There may be some flexibility we can offer to support your academic success.

**Makeup Exams and Late Homework:** There will be NO makeup exams and NO late homework unless there is an emergency.

**Academic Integrity Standards and Consequences:** According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

**ADA Accommodation Statement:** UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will

provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at [disability.unt.edu](http://disability.unt.edu).

**Emergency Notification & Procedures:** UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to the UNT Learning Management System (LMS) for contingency plans for covering course materials.

**Course Evaluation:** The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching.

## Getting Help

### Technical Assistance

Part of working in the online environment involves dealing with the inconveniences and frustration that can arise when technology breaks down or does not perform as expected. Here at UNT we have a Student Help Desk that you can contact for help with Canvas or other technology issues.

UIT Help Desk: [UIT Student Help Desk](http://www.unt.edu/helpdesk/index.htm) (<http://www.unt.edu/helpdesk/index.htm>)

Email: [helpdesk@unt.edu](mailto:helpdesk@unt.edu)

Phone: 940-565-2324

In Person: Sage Hall, Room 130

Canvas Technical Requirements: [Canvas Technical Requirements](https://clear.unt.edu/supported-technologies/canvas/requirements)  
(<https://clear.unt.edu/supported-technologies/canvas/requirements>)

Additional Canvas Support: [Canvas Technical Help](https://community.canvaslms.com/docs/DOC-10554-4212710328)  
(<https://community.canvaslms.com/docs/DOC-10554-4212710328>)

### Academic Support Services

- [UNT Math Lab](https://learningcenter.unt.edu/math-lab) (<https://learningcenter.unt.edu/math-lab>)
- [UNT Learning Center](https://learningcenter.unt.edu) (<https://learningcenter.unt.edu>)
- [Academic Resource Center](https://clear.unt.edu/canvas/student-resources) (<https://clear.unt.edu/canvas/student-resources>)
- [Academic Success Center](https://success.unt.edu/asc) (<https://success.unt.edu/asc>)
- [UNT Libraries](https://library.unt.edu/) (<https://library.unt.edu/>)
- [Writing Lab](http://writingcenter.unt.edu/) (<http://writingcenter.unt.edu/>)

### Student Support Services

UNT provides mental health resources to students to help ensure there are numerous outlets to turn to that wholeheartedly care for and are there for students in need, regardless of the nature of an issue or its severity. Listed below are several resources on campus that can support your academic success and mental well-being:

- [Student Health and Wellness Center](https://studentaffairs.unt.edu/student-health-and-wellness-center) (<https://studentaffairs.unt.edu/student-health-and-wellness-center>)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (<https://studentaffairs.unt.edu/counseling-and-testing-services>)
- [UNT Care Team](https://studentaffairs.unt.edu/care) (<https://studentaffairs.unt.edu/care>)
- [UNT Psychiatric Services](https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry) (<https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry>)
- [Individual Counseling](https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling) (<https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling>)

Other student support services offered by UNT include:

- [Registrar](https://registrar.unt.edu/registration) (<https://registrar.unt.edu/registration>)
- [Financial Aid](https://financialaid.unt.edu/) (<https://financialaid.unt.edu/>)
- [Student Legal Services](https://studentaffairs.unt.edu/student-legal-services) (<https://studentaffairs.unt.edu/student-legal-services>)
- [Career Center](https://studentaffairs.unt.edu/career-center) (<https://studentaffairs.unt.edu/career-center>)
- [Multicultural Center](https://edo.unt.edu/multicultural-center) (<https://edo.unt.edu/multicultural-center>)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (<https://studentaffairs.unt.edu/counseling-and-testing-services>)
- [Pride Alliance](https://edo.unt.edu/pridealliance) (<https://edo.unt.edu/pridealliance>)
- [UNT Food Pantry](https://deanofstudents.unt.edu/resources/food-pantry) (<https://deanofstudents.unt.edu/resources/food-pantry>)

## UNT Policies

### Academic Integrity Standards and Consequences

According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

Cheating on tests, quizzes or final exams is a serious breach of academic standards and will be punished severely and generally result in a student failing the course. All work done on exams and quizzes must represent only the student's own work, unless otherwise stated in the directions. According to [UNT Policy 06.003, Student Academic Integrity](#), academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. See [Academic Integrity](#) for details on academic integrity at UNT.

### Acceptable Student Behavior

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. Visit UNT's [Code of Student Conduct](https://deanofstudents.unt.edu/conduct) (<https://deanofstudents.unt.edu/conduct>) to learn more.

### ADA Policy

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## Important Notice for F-1 Students taking Distance Education Courses

### Federal Regulation

To read detailed Immigration and Customs Enforcement regulations for F-1 students taking online courses, please go to the [Electronic Code of Federal Regulations website](http://www.ecfr.gov/) (<http://www.ecfr.gov/>). The specific portion concerning distance education courses is located at Title 8 CFR 214.2 Paragraph (f)(6)(i)(G).

The paragraph reads:

(G) For F-1 students enrolled in classes for credit or classroom hours, no more than the equivalent of one class or three credits per session, term, semester, trimester, or quarter may be counted toward the full course of study requirement if the class is taken on-line or through distance education and does not require the student's physical attendance for classes, examination or other purposes integral to completion of the class. An on-line or distance education course is a course that is offered principally through the use of television, audio, or computer transmission including open broadcast, closed circuit, cable, microwave, or satellite, audio conferencing, or computer conferencing. If the F-1 student's course of study is in a language study program, no on-line or distance education classes may be considered to count toward a student's full course of study requirement.

### University of North Texas Compliance

To comply with immigration regulations, an F-1 visa holder within the United States may need to engage in an on-campus experiential component for this course. This component (which must be approved in advance by the instructor) can include activities such as taking an on-campus exam, participating in an on-campus lecture or lab activity, or other on-campus experience integral to the completion of this course.

If such an on-campus activity is required, it is the student's responsibility to do the following:

(1) Submit a written request to the instructor for an on-campus experiential component within one week of the start of the course.

(2) Ensure that the activity on campus takes place and the instructor documents it in writing with a notice sent to the International Student and Scholar Services Office. ISSS has a form available that you may use for this purpose.

Because the decision may have serious immigration consequences, if an F-1 student is unsure about his or her need to participate in an on-campus experiential component for this course, s/he should contact

the UNT International Student and Scholar Services Office (telephone 940-565-2195 or email [internationaladvising@unt.edu](mailto:internationaladvising@unt.edu)) to get clarification before the one-week deadline.

## Student Verification

UNT takes measures to protect the integrity of educational credentials awarded to students enrolled in distance education courses by verifying student identity, protecting student privacy, and notifying students of any special meeting times/locations or additional charges associated with student identity verification in distance education courses.

See [UNT Policy 07-002 Student Identity Verification, Privacy, and Notification and Distance Education Courses](https://policy.unt.edu/policy/07-002) (<https://policy.unt.edu/policy/07-002>).