MATH 3319-001 **Differential Equations and Linear Algebra** **Spring 2017**

Instructor: Yinlin Dong

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Office hours: MWF 2:00 pm - 3:00 pm or by appointment

Class time: MWF 1:00 pm - 1:50 pm in LS 122 from Jan 17 to May 5

Textbook: *Differential Equations and Linear Algebra*, 3rd Edition, by Stephen Goode and Scott Annin

Prerequisite: C or better in MATH 2326 or concurrent enrollment

Learning Outcomes: Upon completion of this course, students should be able to solve first-order separable and linear differential equations, solve systems of linear equations, understand vector spaces as a framework for studying linear problems, solve eigenvalue/eigenvector problems, solve linear differential equations of order n, and solve first-order linear systems of differential equations.

Grading Scale: 90 - 100 A; 80 - 89 B; 70 - 79 C; 60 - 69 D; 0 - 59 F

Grading Policy: Attendance is expected and counts for 5% of the course grade. Homework (the assignment sheet) will be assigned but not graded. However, you are strongly encouraged to work on these problems, since similar ones are going to appear on exams.There will be three chapter exams (20% each) and one comprehensive final exam (35%). Extra credits can be earned on each chapter exam (up to 10 points) by completing projects.

Exam Schedule: Exam 1 covering Chapter 1 is scheduled on Monday, February 13.
Exam 2 covering Chapters 2 & 3 is scheduled on Monday, March 20.
Exam 3 covering Chapters 4 & 5 is scheduled on Monday, April 17.
The Final Exam is scheduled on Monday, May 8, 11:00 am - 1:30 pm.

Calculators: No calculators will be allowed in the exams. Formula sheets will be provided as needed.

Makeup Policy: If you have a time conflict with any of the exams, you must contact me in writing at least one week before the exam date and provide the necessary documentations. If the request is approved, a makeup exam will be arranged within one week after the exam. Do not assume that your e-mail has been received if there is no response.

Drop Policy: The last day this semester to drop a course is March 31 prior to 4 pm. Any student who drops the course on or before will receive a W. Students must contact an advisor in their major in order to drop a course. Students will not automatically dropped for non-attendance.

Study Tips: Between lectures, you are expected to review your notes, go through the appropriate sections, understand all relevant examples, and attempt all assigned homework problems. You are expect to spend at least an additional 10 focused hours each week in course related activities, including reading required materials, completing assignments, and preparing for exams. You should work diligently on homework and keep your well-written and complete solutions organized in a notebook. We may discuss one or two homework problems in the beginning of each lecture.

Attendance: At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator in student success. Each faculty member is free to develop his or her own methods of evaluating students academic performance, which includes establishing course-specific policies on attendance. While UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients begin attendance in a course. UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at http://www.uta.edu/oit/cs/email/mavmail.php.

Help in the Course: The Math Clinic (PKH 325) is available to you seven days a week (hours posted at the door) at no additional cost. Go to the Math Clinic website http://www.uta.edu/math/clinic/ for more information. The Math Dept. maintains a list of people who have expressed an interest in tutoring. These persons are not necessarily recommended by the Math Dept. and they set their own fees. You may obtain a copy of the tutor list in the Math Office.

Accommodations and Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the Americans with Disabilities Act (ADA). All instructors at UT Arlington are required by law to provide reasonable accommodations to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364. Student responsibility primarily rests with informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels.

Academic Integrity: Students enrolled are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlingtons tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.
I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System Regents Rule 50101, 2.2, suspected violations of universitys standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the students suspension or expulsion from the University.

Student Disruption: The University reserves the right to impose disciplinary action for an infraction of University policies. For example, engagement in conduct, alone or with others, intended to obstruct, disrupt, or interfere with, or which in fact obstructs, disrupts, or interferes with, any function or activity sponsored, authorized by or participated in by the University.

Drop for Non-Payment of Tuition: If you are dropped from this class for non-payment of tuition, you may secure an Enrollment Loan through the Bursars office.

Student Feedback survey: At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each students feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlingtons effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit http://www.uta.edu/sfs.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should move toward the nearest exits, which are located at the front of the room along the north and south walls. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911. We further recommend that you enter the UTA Police Departments emergency phone number into your own mobile phone. For non-emergencies, contact the UTA PD at 817-272-3381.

Title IX: The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos. For information regarding Title IX, visit www.uta.edu/titleIX.

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more info, visit http://www.uta.edu/news/info/campus-carry/

Disclaimer: Changes to this document or the tentative schedule may be made at the discretion of the instructor.

Tentative Schedule: Spring 2017

1/18	1/20	1/23	1/25	1/27	1/30	2/1	2/3	2/6	2/8	2/10
1.1	1.2	1.2	1.4	1.6	1.6	1.8	1.8	1.9	2.1	review
2/13	2/15	2/17	2/20	2/22	2/24	2/27	3/1	3/3	3/6	3/8
Exam 1	2.2	2.3	2.4	2.4	2.5	2.5	2.6	3.1	3.2	3.3
3/10	3/20	3/22	3/24	3/27	3/29	3/31	4/3	4/5	4/7	4/10
review	Exam 2	4.2	4.2	4.3	4.4	4.5	4.5	4.6	5.1	5.6
4/12	4/14	4/17	4/19	4/21	4/24	4/26	4/28	5/1	5/3	5/5
6.1	review	Exam 3	6.2	6.2	6.3	7.3	7.4	7.4	review	review

Assignment Sheet: Spring 2017

1.1 How DEs Arise 1, 3, 5, 7, 9, 11
1.2 Basic Ideas and Terminology 1, 3, 5, 9, 11, 13, 17, 19, 21, 25, 27, 31, 35, 37, 39
1.4 Separable DEs 1, 3, 5, 7, 15, 25
1.6 First-Order Linear DEs 1, 3, 5, 7, 9, 15, 17, 23
1.8 Change of Variables 1, 3, 5, 7, 9, 11, 13, 37, 39, 41
1.9 Exact DEs 1, 3, 5, 7, 11, 13, 15
2.1 Matrices: Definitions and Notation 1, 3, 5, 9, 11, 13, 15, 17, 19, 21, 23, 27
2.2 Matrix Algebra 1, 3, 7, 9, 11, 13a, 15, 17, 19, 27, 31, 33, 37, 39, 43
2.3 Terminology for Systems of Linear Equations 1, 3, 7, 9, 11, 13, 15, 17
2.4 Elementary Row Operations and Row-Echelon Matrices 1, 3, 5, 9, 11, 15, 19, 21, 25
2.5 Gaussian Elimination 1, 3, 5, 7, 13, 17, 21, 33, 37, 41
2.6 The Inverse of a Square Matrix 1, 3, 7, 9, 19, 21, 23, 25
3.1 Definition of the Determinant 9, 11, 13, 17, 19, 21
3.2 Properties of Determinants 1, 3, 9, 15, 19, 21, 23, 25, 27, 29, 37, 39
3.3 Cofactor Expansions 1, 3, 5, 7, 9, 11, 15, 41
4.2 Definition of a Vector Space 1, 3, 5, 7, 9, 11
4.3 Subspaces 3, 5, 7, 9, 11, 13, 17, 19, 21
4.4 Spanning Sets 1, 3, 5, 7, 11, 13, 17, 21, 23, 25
4.5 Linear Dependence and Linear Independence 1, 3, 5, 7, 13, 15, 19, 21, 29, 31
4.6 Bases and Dimension 3, 5, 7, 13, 15, 17, 21, 23
5.1 Definition of a Linear Transformation 1, 3, 5, 7, 9, 11, 13
5.6 The Eigenvalue/Eigenvector Problem 1, 3, 9, 11, 13, 15, 17, 21, 23, 25
6.1 General Theory for Linear DEs 1a, 3a, 17, 21, 23, 27, 31, 33, 35, 37
6.2 Constant Coefficient Homogeneous Linear DEs 5, 7, 9, 13, 17, 19, 21, 23, 29, 31, 33
6.3 The Method of Undetermined Coefficients: Annihilators 17, 19, 31
7.3 General Results for First-Order Linear Differential Systems 1, 3, 5
7.4 Vector DEs: Nondefective Coefficient Matrix 1, 3, 5, 7, 13, 15, 17