WICHITA STATE UNIVERSITY

MATH 555H, Differential Equations I Honors, 3 credit hours, Spring 2026

Instructor: Tianshi Lu
Department: Mathematics, Statistics, and Physics
Time and Location: MWF 11:30-12:20, Lindquist Hall 113
Office Hours: Jabara Hall 356, Mon Wed 1:00-2:00 pm
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Email: tianshi.lu@wichita.edu (preferred method of contact)
Prerequisite: Math 243 with a grade point of 2.00 or better
Course Website: http://www.math.wichita.edu/~lu/MATH555_S2026

How to use this syllabus

This syllabus provides you with information specific to this course, and it also provides information about important university policies. This document should be viewed as a course overview; it is not a contract and is subject to change as the semester evolves.

Academic Honesty

Students are responsible for following the Student Code of Conduct http://webs.wichita.edu/inaudit/ch8_05.htm and the Student Academic Honesty policy http://webs.wichita.edu/inaudit/ch2_17.htm.

Course Description

A study of first order equations including separation of variables and exact equations, second order equations including the general theory of initial value problems, constant coefficients, undetermined coefficients, variation of parameters and special methods of solution using power series and the Laplace transform methods. A standard course in differential equation for students in the sciences and engineering.

Definition of a Credit Hour

Success in this 3 credit hour course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction and preparation/studying or course related activities for a total of 135 hours.

Measurable Student Learning Outcomes

Upon successful completion of this course, students will be able to:

Introduction: Classify differential equations. Visualize solutions using direction fields.

First order differential equations: Demonstrate proficiency solving separable equations and linear equations. Understand exact equations and integrating factors. Model with first order equations. Understand linearity, existence and uniqueness of solutions to linear equations.

Second order differential equations: Solve linear equations with constant coefficients using the characteristic equation and the method of undetermined coefficients. Understand the Wronskian, order reduction, and variation of parameters.

Series solutions of second order linear equations: Determine and classify singular points of second order linear equations. Find series solutions near ordinary and regular singular points using the indicial equation.

The Laplace Transform: Define and compute the Laplace transform of elementary functions. Solve initial value problems using the Laplace transform, including those involving step functions and impulse functions.

Required Texts/Readings

Elementary Differential Equations and Boundary Value Problems. Ed. 12. Boyce & DiPrima.

Class Protocol

Although the attendance record will not be kept for the class, students are expected to attend classes regularly. If a student has difficulty with course material or homework problems, the student should promptly seek help.

Grading Scale

WSU uses a +/- grading scale for final grades and to calculate grade point averages. In this class, grades are assigned according to the following chart. (Note: the chart below is a sample that may be used). (Other classes might assign grades differently: Be sure to understand the different grading scales in all of your classes.)

Points/percentages, as instructor chooses	Letter Grade	Grade Points	Interpretation
90-100	A	4.00	The A range denotes excellent performance.
87-89	A-	3.70	
83-86	B+	3.30	
80-82	B	3.00	The B range denotes good performance.
77-79	B-	2.70	
73-76	C+	2.30	
70-72	C	2.00	The C range denotes satisfactory.
67-69	C-	1.70	
63-66	D+	1.30	
60-62	D	1.00	The D range denotes unsatisfactory.
57-59	D-	0.70	
Below 57	F	0.00	F denotes failing performance.

Assignments and Exams

There will be weekly assignments, to be determined for 10%, and 3 midterm exams. The accumulative final exam will be on May 6. The lowest score of the 3 midterm exams will be dropped. The remaining 2 midterm exams and the final exam count for 30% each. All exams will be in a "closed book, closed notes" format, but you are allowed to bring a **handwritten** "cheat sheet" to your exams.

Late Assignments

Late assigments will not be accepted.

Important Academic Dates

For spring semester 2026, classes begin on January 21 and end on May 6. The last date to drop a class and receive a W (withdrawn) instead of F (failed) is March 31.

Disabilities

If you have a physical, psychiatric/emotional, medical or learning disability that may impact your ability to carry out assigned course work, I would encourage you to contact the Office of Disability Services (DS). The office is located in Grace Wilkie Annex, Room 150, (316) 978-3309 (voice/tty) (316-854-3032 videophone). DS will review your concerns and determine, with you, what accommodations are necessary and appropriate for you. All information and documentation of your disability is confidential and will not be released by DS without your written permission.

Counseling & Testing

The WSU Counseling & Testing Center provides professional counseling services to students, faculty and staff; administers tests and offers test preparation workshops; and presents programs on topics promoting personal and professional growth. Services are low cost and confidential. They are located in room 320 of Grace Wilkie Hall, and their phone number is (316) 978-3440. The Counseling & Testing Center is open on all days that the University is officially open. If you have a mental health emergency during the times that the Counseling & Testing Center is not open, please call COMCARE Crisis Services at (316) 660-7500.Wichita State University is committed to being an inclusive campus that reflects the evolving diversity of society. To further this goal, WSU does not discriminate in its programs and activities on the basis of race, religion, color, national origin, gender, age, sexual orientation, gender identity, gender expression, marital status, political affiliation, status as a veteran, genetic information or disability. The following person has been designated to handle inquiries regarding nondiscrimination policies: Executive Director, Office of Equal Opportunity, Wichita State University, 1845 Fairmount, Wichita KS 67260-0138; telephone (316) 978-3186.

Diversity and Inclusive

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Intellectual Property

Wichita State University students are subject to Board of Regents and University policies (see http://webs.wichita.edu/inaudit/ch9_10.htm) regarding intellectual property rights. Any questions regarding these rights and any disputes that arise under these policies will be resolved by the President of the University, or the Presidents designee, and such decision will constitute the final decision.

Shocker Alert System

Get the emergency information you need instantly and effortlessly! With the Shocker Alert System, we will contact you by email the moment there is an emergency or weather alert that affects the campus. Sign up at www.wichita.edu/alert.

Title IX

Title IX of the Educational Amendments of 1972 prohibits discrimination based on sex in any educational institution that receives federal funding. Wichita State University does not tolerate sex discrimination of any kind including: sexual misconduct; sexual harassment; relationship/sexual violence and stalking. These incidents may interfere with or limit an individual's ability to benefit from or participate in the University's educational programs or activities. Students are asked to immediately report incidents to the University Police Department, (316) 978-3450 or the Title IX Coordinator (316) 978-5177. Students may also report incidents to an instructor, faculty or staff member, who are required by law to notify the Title IX Coordinator. If a student wishes to keep the information confidential, the student may speak with staff members of the Counseling and Testing Center (316) 978-3440 or Student Health Services (316)978-3620. For more information about Title IX, go to: http://www.wichita.edu/thisis/home/?u=titleixf.

Video and Audio Recording

Video and audio recording of lectures and review sessions without the consent of the instructor is prohibited. Unless explicit permission is obtained from the instructor, recordings of lectures may not be modified and must not be transferred or transmitted to any other person, whether or not that individual is enrolled in the course.

Tentative Schedule for 15 week class

Week	Topics, Readings, Assignments, Deadlines
1	Introduction to differential equations. Direction fields. Classification of differential equations. *Assignment 1 assesses direction fields, solutions of some differential equations, and classification.*
2	First order linear equations. Separable equations. *Assignment 2 assesses linear and separable equations.*
3	Modeling with first order equations. Nonlinear equations. Exact equations and integrating factors. *Assignment 3 assesses modeling simple systems, exact equations and integrating factors.*
4	Review of Chapter 1 and 2. Midterm exam I.
5	Homogeneous equations with constant coefficients. Linearity and the Wronskian.
6	The characteristic equation. Complex roots. *Assignment 4 assesses Wronskian and characteristic equation.*
7	Reduction of order. Method of undetermined coefficients.
8	Variation of parameters. Solution to nonhomogeneous equations. *Assignment 5 assesses method of undetermined coefficients and variation of parameters.*
9	Review of Chapter 3. Midterm exam II.
10	Review of power series. Series solutions near an ordinary point.
11	Euler equations. Regular singular points. *Assignment 6 assesses series solutions near an ordinary point.*
12	Series solutions near a regular singular point. *Assignment 7 assesses regular singular points.*
13	Review of Chapter 5. Midterm exam III.
14	Definition of the Laplace transform. Solution of initial value problems. *Assignment 8 assesses computing the Laplace transform and solving initial value problems using the Laplace transform.*
15	Step functions, impulse functions, and applications. *Assignment 9 assesses solving differential equations with discontinuous and impulsive forcing functions.*
Final	Review and practice final exam. Accumulative final exam.