

# Differential Equations (3)

(Effective Fall 2019)

**Prerequisite:** Math 252.

**Catalog Description:** Setting up and solving first order equations, applications of first order equations. Wronskians, use of operators and exponential shift theorem, solutions of higher order equations with constant coefficients. Systems of first order equations, solutions in series, Laplace transform methods.

**Learning Outcomes for Major:** This course addresses one or more of the student learning outcomes for the major. Upon completion of his/her degree from the University of Tennessee at Martin with a major in mathematics, the graduate will be able to:

- i. apply mathematical concepts and principles to perform numerical and symbolic computations.
- ii. use technology appropriately to investigate and solve mathematical and statistical problems.
- iii. write clear and precise proofs.
- iv. communicate effectively in both written and oral form.
- v. demonstrate the ability to read and learn mathematics and/or statistics independently.

**Teaching Objectives:** The student will:

1. Solve differential equations of order one and apply their solutions.
2. Use operators and the exponential shift to solve higher order linear differential equations with constant coefficients.
3. Solve systems of first order equations.
4. Use Laplace transform methods in solving differential equations.

**Text(s):** Ordinary Differential Equations, Noonburg, second ed., 2019, MAA Textbook Series. ISBN: 978-1-4704-4400-6.

Outline:	Chapter	Title (Sections)	Days
	1	Introduction (1-3)	1
	2	First-order Differential Equations (1-6)	10
	3	Second-order Differential Equations (1-7)	12
	4	Linear Systems of First-order Differential Equations (1)	2
	5	Geometry of Autonomous Systems (1)	2
	6	Laplace Transforms (1-5)	9
		One period tests	4
		Total days	40

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