

MATH 3705 - Differential Equations

Fall 2026 Syllabus, Section 01, CRN 40506,

Credit hours: 3

Instructor

Padraic Taylor

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Public Instructor Information

Instructor Title: Dr. Paddy Taylor

Instructor Professional Qualifications: *Ph. D., Mathematics, North Carolina State University, 2006*

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Course Description

3705. Differential Equations. Methods and theory of solving differential equations with applications. Existence, uniqueness. First order equations. Higher order linear equations. Introduction to partial differential equations and boundary value problems, including Laplace's equation. Prereq.: C or better in one of MATH 2673, MATH 2673H, or MATH 2686H. 3 s.h.

Course Readings

Group	Title	Author	ISBN
Required	MyLab Math with Pearson eText Access Code (18 Weeks) for Fundamentals of Differential Equations and Boundary Value Problems, 7th Edition	r. kent nagle; edward b. saff; arthur david snider	8220144725962

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Schedule of Topics and Assignments

Week of	Reading(s)	Proposed Topic	Due/To Prepare for Class
8/24	1.1, 1.2	Background, Solutions and Initial Value Problems	
8/31	1.3, 1.4	Direction Fields and Euler's Method	
9/7	2.2, 2.3	First Order Differential Equations	
9/14	2.3, Bernoulli equations, 3.2, 3.3	First Order Differential Equations and Applications	
9/21	4.2, 4.3	Homogeneous 2nd Order Linear Differential Equations	
9/28	4.4	Nonhomogeneous 2nd Order Linear D.E's (undetermined Coeff)	
10/5	4.5, 4.7	Nonhomogeneous 2nd Order Linear D.E's (variation of parameters) and Cauchy Euler Equations	
10/12	4.9, 4.10	Spring Mass Systems	
10/19	7.1-7.3	Intro to Laplace Transforms	
10/26	7.4-7.6	Inverse Laplace Transforms, Initial Value Problems, and Discontinuous Functions	

11/2	9.1-9.4	Linear Algebra Background for Systems of Linear D.E's
11/9	9.5	Linear Systems of D.E.'s, Eigenvalues, Eigenvectors
11/16	9.6, 9.7	Linear Systems with complex eigenvalues and Nonhomogeneous Linear Systems
11/23	9.7	Nonhomogeneous Linear Systems (and Thanksgiving Break!)
11/30		Defective Linear Systems
12/7		Finals week

The course schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better learning.