## **MATH 489 – Partial Differential Equations**

**Course Description from Bulletin:** First-order equations, characteristics. Classification of second-order equations. Laplace's equation; potential theory. Green's function, maximum principles. The wave equation: characteristics, general solution. The heat equation: use of integral transforms. (3-0-3)

Enrollment: Elective for AM and other majors

Textbook(s): Walter E. Strauss, Partial Differential Equations: An introduction, Wiley

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	a.	Laplace's equation		
	b.	Poisson's equation		
	с.	Maximum principles		
	d.	Poisson's formula for solutions of boundary value problems in disk		
	e.	Green's functions		
	f.	Uniqueness		
5.	5. Waves in space			
	a.	Characteristic cone		
	b.	Hugyen's Principle		
6. General Fourier Series			8	
	a.	Orthogonality		
	b.	Eigenfunction expansions		
	с.	Bessel functions and Legendre fun	ctions	
7.	Some	non-linear equations	6	
8.	Some	physical examples	4	
Assessment:		Homework	10-30%	
		Computer Programs/Project	10-20%	
		Quizzes/Tests	20-50%	
		Final Exam	30-50%	

**Syllabus prepared by**: Xiaofan Li and Jeffrey Duan **Date**: 12/17/05