Mathematical Methods of Physics
MA/PHY507
Spring 2013

Instructor	P. D. Hislop, Mathematics
Office:	753 POT
	7-5637 or hislop@ms.uky.edu
Text:	Arfken, Weber, and Harris: *Mathematical Methods for Physicists*
	Elsevier, seventh edition
Class Meetings:	MWF 12:00–12:50 CB 345
Course Web Page:	$http://www.ms.uky.edu/ \sim hislop/$, find homework and comments there
Office Hours:	MW 3:00-4:00

The purpose of this two semester course is to develop a collection of mathematical methods useful in solving physical problems in fluids and mechanics, electricity and magnetism, and quantum mechanics. We will cover ordinary differential equations, linear algebra, partial differential equations, special functions, and complex variable theory. In MA/PHY 507, we'll begin by studying complex variable theory. The goal is the residue theorem. We'll then go to PDEs and study the three basic types: wave, heat, and Laplace's equations. We'll solve boundary value problems for Laplace's equation by separation fo variables. This will lead us back to special function theory. We'll develop eigenfunction expansions and Green's functions. If we have time, we study the Fourier transform, Chapter 20.

Grading Policy There will be 10 homework sets collectively worth 30% of the course grade, one in-class hour exam worth 30%, and an in-class final exam worth 40%. Letter grades will be assigned on the standard scale: A: 90 and above; B 80–89; C: 70–79. You may discuss the homework problems, but each student is expected to write the solutions individually. Homework will be assigned at least one week before it is due.

Course Content

This course will have three units:

- Unit 1: Complex Variables, Chapter 11.

- Unit 2: Partial Differential Equations, Chapters 9 and 10.

- Unit 3: Special Functions, Chapters 14, 15, and 18.

- Special Unit (time permitting): Fourier Transform, Chapter 20.

Special Dates for Spring 2013

15 January	Last day to add a class
21 January	M. L. King, Jr. Holiday-No classes
30 January	Last date to withdraw with no grade
1 March	Target date for Exam 1, in class
4 March	Midterm of Spring 2013 Semester
11–15 March	Spring Break
5 April	Last day to withdraw and receive a W grade
26 April	Last day of classes
29 April	Final Exam 10:30 AM – 12:30 PM in class CB 345