PHYS 3310 – MATHEMATICAL METHODS IN THE PHYSICAL SCIENCES
Syllabus Fall 2013

Dr. David Shiner (shiner@unt.edu)   **Class time: MWF 11:00-11:50 am**
Office: Physics 305   Phone: 565-3874.   **Class location: Physics Room 311**
Office Hours: M 12:00-1:00 pm or by appointment   **Recitation: W 12:00-12:50 pm, Rm 311**

Textbooks

Required: *Mathematical Methods in the Physical Sciences*, by Mary L. Boas (3rd edition, John Riley & Sons 2006), ISBN-13 978-0-471-19826-0.

Recommended: *Essential Mathematical Methods for Physicists*, by Hans J. Weber and George B. Arfken (Elsevier, Academic Press, 2003).
Mathematical Methods for Physicists: A Comprehensive Guide, by George B. Arfken, Hans J. Weber and Frank E. Harris (7th edition, Academic Press, 2012).
Mathematical Methods for Physics and Engineering: A Comprehensive Guide, K. F. Riley, M. P. Hobson and S. J. Bence (2nd edition, Cambridge University Press, 2002).

Prerequisites: Physics 2220 and Math 1720 - Calculus II. Recommend Math 2730 - Mult. Var. Cal.

Content: The course involves the introduction and application of advanced mathematical techniques to the solution of problems in physics.

Objective   We will survey a large number of mathematical methods used in physics and physical sciences. In particular we will learn the basics of the methods that are needed in junior and senior courses in physics, as well as chemistry and engineering.

Homework   Assignments will be given each week. Please feel free to discuss and work together with others on these problems if you wish. What is important is that you make a good faith effort on each problem set and that you eventually understand how to do the problems and submit your own work. The problem sets will be collected each week and graded 10 points/problem. Exams will be largely based on the homework problems assigned.

Office Hours   My office is on the third floor of the physics building (room 305). My phone number is 565-3874, email is shiner@unt.edu. Office hours will be M 12:00 - 1:00 pm or by appointment.

Grading   The course grader is Zohreh Najmizadeh (ZohrehNajmizadeh@my.unt.edu). Scores for home work, quizzes, and exams will be posted on blackboard.

Course Grade

Exams	50%
Quizzes	10%
Home Work	10%
Final Exam	30%
Total	100%

You are responsible for modifications to this syllabus and any other information presented in class. No makeup exams will be given.

Date	Day	Subject (Chapter)	Assignment	Due
Aug. 28	W	Infinite Series, Power Series (Ch. 1)	Ch. 1: 2.1, 2.4, 2.7, 10.4, 12.1	
30	F	Complex Numbers (Ch. 2)	Ch. 2: 5.25, 5.26, 9.13, 9.34	
			16.8, 16.13	**Ch. 1 & 2 due.**
Sept. 2	M	Labor Day		
4	W	Linear Algebra (Ch. 3)		
6	F	"		
9	M	"		
11	W	"		
13	F	"		
16	M	Partial Differentiation (Ch. 4)		
18	W	"		
20	F	**EXAM 1: Chapters 1-4.**		
23	M	Multiple Integrals (Ch. 5)		
25	W	"		
27	F	"		
30	M	Vector Analysis (Ch. 6)		
Oct. 2	W	"		
4	F	"		
7	M	Fourier Series and Transforms (Ch. 7)		
9	W	"		
11	F	"		
14	M	Ordinary Differential Equations (Ch. 8)		
16	W	"		
18	F	"		
21	M	Calculus of Variations (Ch. 9)		
23	W	"		
25	F	**EXAM 2: Chapters 5-9**		
28	M	Tensor Analysis (Ch. 10)		
30	W	"		
Nov. 1	F	"		
4	M	Special Functions (Ch. 11)		
6	W	"		
8	F	"		
11	M	Series Solutions of D.E. (Ch. 12)		
13	W	"		
15	F	"		
18	M	Partial Differential Equations (Ch. 13)		
20	W	"		
22	F	"		
25	M	Functions of a Complex Variable (Ch. 14)		
27	W	**EXAM 3: Chapters 10-13**		
29	F	Thanksgiving		
Dec. 2	M	Probability and Statistics (Ch. 15)		
4	W	"		
6	F	**Reading Day**		

Comprehensive Final Exam: Monday, Dec. 9, 2006, 10:30 a.m. - 12:30 p.m.