

Subject to Modification – Aug. 28, 2013  
**PHYS 3310 – MATHEMATICAL METHODS IN THE PHYSICAL SCIENCES**  
**Syllabus Fall 2013**

**Dr. David Shiner (shiner@unt.edu)**  
**Office: Physics 305 Phone: 565-3874.**  
**Office Hours: M 12:00-1:00 pm or by appointment**

**Class time: MWF 11:00-11:50 am**  
**Class location: Physics Room 311**  
**Recitation: W 12:00-12:50 pm, Rm 311**

Textbooks

**Required:** *Mathematical Methods in the Physical Sciences*, by Mary L. Boas (3rd edition, John Wiley & 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 (7<sup>th</sup> edition, Academic Press, 2012).  
*Mathematical Methods for Physics and Engineering: A Comprehensive Guide*, K. F. Riley, M. P. Hobson and S. J. Bence (2<sup>nd</sup> 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](mailto: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](mailto:ZohrehNajmizadeh@my.unt.edu)). Scores for home work, quizzes, and exams will be posted on blackboard.

<u>Course Grade</u>	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.

*The University of North Texas is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 92-112 – The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act (ADA), pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.*

UNT's policy on Academic Dishonesty can be found at: <http://www.vpaa.unt.edu/academic-integrity.htm>  
Drop information is available in the schedule of classes at: <http://essc.unt.edu/registrar/schedule/scheduleclass.html>

NOTICE: SETE (Student Evaluation of Teaching Effectiveness): *The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester and will remain open through the week of finals, providing you a chance to comment on how this class is taught. I consider the SETE to be an important part of your participation in this class.*

<u>Date</u>	<u>Day</u>	<u>Subject (Chapter)</u>	<u>Assignment</u>	<u>Due</u>
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	<b>Ch. 1 &amp; 2 due.</b>
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	<b>EXAM 1: Chapters 1-4.</b>		
23	M	Multiple Integrals (Ch. 5)		
25	W	"		
27	F	"		
Oct. 30	M	Vector Analysis (Ch. 6)		
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	<b>EXAM 2: Chapters 5-9</b>		
Nov. 28	M	Tensor Analysis (Ch. 10)		
30	W	"		
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	<b>EXAM 3: Chapters 10-13</b>		
29	F	Thanksgiving		
Dec. 2	M	Probability and Statistics (Ch. 15)		
4	W	"		
6	F	<b>Reading Day</b>		

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