PHYSICS 2335: Introductory Mathematical Methods for Physicists

Instructor:	David Clarke	MM 301E, 420-5830, dclarke@ap.smu.ca
Grader:	TBA	
Lectures:	MM 310	T Θ, 2:30 pm–3:45 pm
Tutorials:	MM 310	F, 1:00 pm–2:15 pm
Office Hours:	MM 301E	MW, 1:00–4:00 pm
Textbook:	Arfken: "Mathematical Methods for Physicists", Fifth Edition	
Assignments:	Assigned more or less weekly; late assignments assessed a 10% penalty per day late.	
Assessment:	Assignments	40%
	1 hour midterm	15%
	3 hour Final	45%
Course web site:	http://www.ap.smu.ca/~dclarke/PHYS2335	

Outline

PART 1. INTRODUCTION (7 lectures)

I. Summations (2)
II. Taylor and Binomial Expansions (2)
III. Simple Differential Equations
IV. Vectors (1.5)
V. Introduction to UNIX and GNUplot graphics (0.5)

PART 2. VECTOR CALCULUS (7 lectures)

I. Partial Derivatives, Vectors, and Dual Vectors
II. Coordinate Transformations
III. Gradient, Divergence, and Curl
IV. Vector Integration (2)
V. Theorems of Gauss, Green, and Stokes (2)

MIDTERM (Thursday, November 2, 1:00pm–2:15pm, MM310)

PART 3. LINEAR ALGEBRA (9 lectures)

I. Overview of Vector Spaces
II. Matrices (2)
III. Determinants, Matrix Inversion
IV. Systems of Equations (Gauss-Jordan Elimination) (2)
V. Eigenalgebra (3)

Approximate course schedule

Calendar						Assignment		
Tuesday (T)		Thursday (Θ)		Friday (F)		#	assigned	due
Sept 5	no class	Sept 7	1.I	Sept 8	—	—	—	—
Sept 12	1.I	Sept 14	1.II	Sept 15	Tut 1	—	—	—
Sept 19	1.II	Sept 21	1.III	Sept 22	Tut 2	1	Sept 19	Sept 26
Sept 26	1.IV	Sept 28	1.V	Sept 29	Tut 3	2	Sept 26	Oct 3
Oct 3	2.I	Oct 5	2.II	Oct 6	Tut 4	3	Oct 3	Oct 10
Oct 10	2.III	Oct 12	2.IV	Oct 13	Tut 5	4	Oct 10	Oct 17
Oct 17	2.IV	Oct 19	2.V	Oct 20	Tut 6	5	Oct 17	Oct 31
Oct 24	2.V	Oct 26	3.I	Oct 27	Tut 7	—	—	—
Oct 31	3.II	Nov 2	midterm	Nov 3	Tut 8	6	Oct 31	Nov 14
Nov 7	3.II	Nov 9	3.III	Nov 10	Tut 9	—	—	—
Nov 14	3.IV	Nov 16	3.IV	Nov 17	Tut 10	7	Nov 14	Nov 21
Nov 21	3.V	Nov 23	3.V	Nov 24	Tut 11	8	Nov 21	Nov 28
Nov 28	3.V	Nov 30	review	Dec 1	—	9	Nov 28	Dec 1*

*No late penalty assessed for Assignment 9 if it is received by Tuesday, December 5, 2006.

The midterm is taken in-class, and requires a student to do three of four problems. Problems are of similar calibre as homework problems. Please bring sharp pencils, erasers, and a simple scientific calculator. Paper is provided.

Date, time, and location of final exam TBA. Roughly, 40% of the final exam will be based on Parts 1 and 2, 60% on Part 3. The student will be required to do 8 of 10 problems, each being of a similar calibre to homework problems. Some problems will be straight from homework and tutorial sets, other will be brand new. Please bring sharp pencils, erasers, and a simple scientific calculator. Paper is provided.

Note: last day for withdrawal from a fall semester course without academic penalty is Friday, November 10, 2006.