PHYSICS 400
APPLICATIONS OF MATHEMATICS IN PHYSICAL SCIENCES
FALL 2014 / Watanabe Hall 114 / MWF, 11:30 AM - 12:20 PM
Monday, August 25 – Wednesday, December 10

Instructor
Dr. Chester Vause
Professor, Department of Physics & Astronomy
Watanabe Hall 434, 808-956-2989, cvause@hawaii.edu
Office Hours: See instructor after class to make an appointment.

Prerequisites
Math 244 or 253A, and Math 311

Textbook (Required)
Mathematical Methods for Physicists (7th edition), G. Arfken, H. Weber, and F. Harris
(Academic Press, 2013)

Textbook Chapters
Selected topics in tex
tbook chapters:

3	Vector Analysis
2, 5, 6	Determinants and Matrices, Linear Algebra / Vector Spaces
1, 11	Calculus of Complex Variables
20	Integral Transforms
8, 12, 19	Sturm-Liouville Theory-Orthogonal Functions / Series
15, 18	Special Functions

Omitted sections in chapters to be announced in class. Selected topics in other chapters
may be included, time permitting.

Student Learning Outcomes
Among the student learning outcomes of this course are the abilities to:
(a) Use complex variables, analytic function theory, and contour integration in the
solution of mathematical problems applied to physics
(b) Apply vector calculus in the formalism of physical theories
(c) Formulate general linear equations in terms of matrix algebra and the eigenvalue
problem as applied in physics
(d) Understand the general mathematical formulation of orthogonal functions resulting
from ordinary differential equations used in physics and the relationship to linear
algebraic vector spaces

Homework Assignments
Suggested problems will be assigned to give the student practice (not to be turned-in).
Some problems will be worked-out in class.

Exams

Exams are closed-book, two student-generated note pages per new material (2 for Exam 1, 4 for Exam 2, 6 for Final Exam), and <u>scientific</u> calculator, only. No internet devices or electronic storage media. Exam dates are:

Exam 1	Monday	September 29, 2014
Exam 2	Monday	November 3, 2014
Final Exam	Monday	December 15, 2014, 12:00PM – 2:00PM

Each Exam is worth 1/3 contribution of the Total Score. Each Exam (including the Final Exam) is based on material covered since the <u>previous</u> Exam.

Grade Scale

Letter grade is determined from the total score according to the following scale:

A- (86%-90%)	A (91%-95%)	A+ (96%-100%)
B- (61%-70%)	B (71%-80%)	B+ (81%-85%)
C- (31%-40%)	C (41%-50%)	C+ (51%-60%)
	F (0%-20%)	D (21%-30%)

NO INCOMPLETE GRADE GIVEN

NOTICE

Be prepared to take the tests in-class as assigned. This is not negotiable. If you have time conflicts, decide if this course is your first priority. I do not "work around" student's personal plans (travel and otherwise) and schedules.

This course is a lecture format. I do not take attendance. If you come to class, plan to stay. Excessive coming and going will not be tolerated. If you are late, enter quietly through the back door. Do not disturb the class.

<u>No electronic recording and no electronic storage of any kind of lectures and lecture board writing.</u>

<u>No internet devices (electronic smart phones, pads/tablets, computers, etc.). Turn off your wireless telephones, etc., and PUT THESE AWAY. Do not attend to these during class (no texting, etc.) as such behavior is distracting to the instructor and your classmates.</u>