

PHYSICS 610
ANALYTICAL MECHANICS
FALL 2014 / Watanabe Hall 417A / TTh, 1:30 PM - 2:45 PM
Tuesday, August 26 – Thursday, December 11

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 (UHM Catalog)

Physics 600 (or concurrent); or Math 402 (Partial Differential Equations I)

Textbooks

“Mechanics” (3rd ed.) Course of Theoretical Physics, Volume 1, L. D. Landau and E. M. Lifshitz (Butterworth-Heinemann Ltd., Oxford, 1976) [required]

“The Classical Theory of Fields” (4th revised English ed.) Course of Theoretical Physics, Volume 2, L. D. Landau and E. M. Lifshitz (Pergamon Press, Oxford, 1975) [recommended]

Student Learning Outcomes

Among the student learning outcomes of this course are the abilities to:

- (a) Understand the formal fundamental principles of mechanics in its most generalized forms such as the Principle of Relativity, Lagrangian and Hamiltonian formulations, Hamilton-Jacobi theory, Action-Angle Variables, Poisson Brackets
- (b) Study applications of Analytical Mechanics in selected topics such as: many-particle (body) oscillations, rigid-body motion, central-force motion
- (c) Use of various mathematical techniques such as variational principles, tensor analysis, Legendre transformations, partial differential equations in the formulation of Classical Mechanics
- (d) Apply tensor analysis methods to geometric concepts in Einstein’s formulation of the general theory of gravity (General Relativity) as a branch of Classical Mechanics.

Assignments

Course problems will be assigned and graded. (No in-class exams.)

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

No electronic recording and no electronic storage of any kind of lectures and lecture board writing.

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.