

PHYSICS 610
ANALYTICAL MECHANICS
FALL 2016 / Watanabe Hall 417A / TTh, 1:30 PM - 2:45 PM
Monday, August 22 – Friday, December 16

Instructor

Dr. Chester Vause
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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

“Classical Mechanics,” 3rd edition, H. Goldstein, C Poole, and J. Safko (Addison Welsey, N.Y.,2002)

Recommended:

“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 Special Relativity, and introductory concepts in 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.) There may be suggested problems to work out (Not graded.)

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.