

# Physics 610

## Analytical Mechanics

**Instructor:** Jason Kumar  
WAT 436  
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**Class meets:**  
T Th 1:30pm-2:45pm  
WAT 417A

**Required Textbook:**  
Classical Mechanics (3<sup>rd</sup> Edition)  
Herbert Goldstein, Charles Poole, John Safko

**Topics to be covered:**

Lagrangians  
The Two-Body Problem  
Rigid Body Motion  
Hamiltonians and Canonical Transformations  
Relativity  
Classical Field Theory  
Chaos

**Grading:**

The course grade will be based on homework and exams

60% -- homework  
20% -- midterm  
20% -- final

**Student Learning Outcomes:**

At the successful completion of this course, students will be expected to:

- 1) Be able to solve problems in classical mechanics, including advanced examples of two-body motion, rigid body motion, and relativity.
- 2) Understand the Lagrangian formalism, and its application to solving problems in classical mechanics.
- 3) Understand the Hamiltonian formalism, canonical transformations, and their relations to quantum mechanics and statistical mechanics.