

# SYLLABUS

## Intermediate Classical Mechanics PHYS 3550 Spring 2018

**Instructor:** Dr. Boyd F. Edwards, SER 204, (435) 640-5954, boyd.edwards@usu.edu

**Assistant:** Kenneth Zia, SER 211, kennethzia@gmail.com

**Pre/corequisites:** PHYS 2710 (co-requisite), MATH 2210 (prerequisite), MATH 2250 (co-requisite)

**Text:** Classical Mechanics, John R. Taylor

**Classes:** TR 1:30 – 2:45 PM in Engr. Lab. 250

**Recitations:** W 6:30 PM in SER 122

**Course:** <http://canvas.usu.edu/> (used for announcements outside of class)

## OUTCOMES

After successfully completing this class, students will be able to:

- Describe and apply Newton's three laws for objects with constant and non-constant mass.
- Describe and apply conservation of energy, momentum, and angular momentum.
- Define "central force" and describe the motion of an object subject to the gravitational force.
- Describe simple harmonic motion, driven-damped oscillations, and resonance.
- State the basic principles of calculus of variations and the Euler-Lagrange equation.
- Use Lagrange's equations to solve problems both with and without constraints.
- Solve problems in non-inertial reference frames.
- Define chaos and state the phase-space dimensionality needed for chaos.

## ASSESSMENTS

**I. Class Quizzes (36% of grade)** Twelve quizzes will be given throughout the semester, with each quiz counting for 3% of the total grade. These quizzes will be given at the beginning of class on Thursdays, according to the schedule below. Each quiz will be drawn from the material discussed in lecture the previous week, and from the problems assigned the previous Thursday.

**II. Tests (63% of grade)** There will be three tests, two on Thursdays during the semester and one during finals week, according to the schedule below. Each test counts for 21% of the grade, and will cover approximately one third of the material in the course. The last test will not be comprehensive.

**III. IDEA Evaluation (1% of grade)** Each student that completes the IDEA evaluation for the course (administered in the final weeks of the course) will receive full credit for completing it.

A ≥ 93%,  
A- ≥ 90%,  
B+ ≥ 87%,

B ≥ 83%,  
B- ≥ 80%,  
C+ ≥ 77%,

C ≥ 73%,  
C- ≥ 70%,  
D+ ≥ 67%,

D ≥ 63%,  
D- ≥ 60

## ENVIRONMENT

I am committed to fostering a nurturing learning environment based upon open communication, mutual respect, and non-discrimination on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color, or national origin. Academic integrity is expected of all students, and is strictly enforced. Accommodations for physical, sensory, emotional, or medical impairments must be coordinated through the USU Disability Resource Center, at (435) 797-2444. Veterans may be eligible for accommodations. Please advise me if you anticipate needing any type of accommodation to participate in this class.

## SCHEDULE

Week of	Tuesday	Thursday
Jan 8	1.1-1.3	1.4-1.5
Jan 15	1.6-1.7	2.1-2.3 Quiz 1
Jan 22	2.4-2.5	2.6-2.7 Quiz 2
Jan 29	3.1-3.2	3.3-3.5 Quiz 3
Feb 5	4.1-4.3	Test 1 (Ch. 1, 2, 3)
Feb 12	4.4-4.6	4.7-4.9 Quiz 4
Feb 19	No Class – Monday Schedule	5.1-5.2 Quiz 5
Feb 26	5.4	5.5-5.6 Quiz 6
Mar 5	Spring Break	Spring Break
Mar 12	6.1-6.2	6.3-6.4 Quiz 7
Mar 19	7.1-7.3	7.5-7.7 Quiz 8
Mar 26	8.1-8.3	Test 2 (Ch. 4, 5, 6, 7)
Apr 2	8.4-8.5	8.6-8.8 Quiz 9
Apr 9	9.1-9.3	9.4-9.6 Quiz 10
Apr 16	9.7-9.10	12.1-12.3 Quiz 11
Apr 23	12.4-12.6	12.7-12.9 Quiz 12
Apr 30	Finals Week – No Class	Test 3 (Ch. 8, 9, 12)

Decimal numbers signify the sections of the textbook to be covered on that day. On Thursdays, problems will be assigned on the material covered that week, and a short quiz will be given on the problems assigned the previous week. No class will be held on Tuesday, February 20 because that day follows the Monday class schedule.