PHYS 311- (Undergraduate) Theoretical Mechanics II (3 credits)
Department of Physics & Astronomy, University of Hawaii
Instructor: Prof. Pui K. Lam
Spring Semester 2018

Time: MWF 9:30 - 10:20 a.m.
Place: WAT 114
Instructor: Prof. Pui K. Lam (956-2988; plam@hawaii.edu)
Office Hours: TBD
Grader:

Text: "Classical Mechanics" by John R. Taylor, University Science Books.

Pre-req: Ph310 (or instructor's consent)

Course Outline:

Ch. 9 - Mechanics in Non-inertial Frames
Ch. 10 - Rotational Motion of Rigid Bodies
Ch. 11 – Coupled Oscillations and Normal Modes
Ch. 12 – Nonlinear Mechanics and Chaos (May skip)
Ch. 13 – Hamiltonian Mechanics
Ch. 14 – Collision Theory
Ch. 15 – Special Relativity
Ch. 16 – Continuum Mechanics

We will spend approximately 1.5 - 2 weeks per chapter.

Pre-lecture student questions (10% of course grade):

To promote active learning, you will be asked to write a short summary statement on your reading assignment and pose one question of what you do not understand (If you understood everything, then pose an exam like question). Respond to the Google form by 5 p.m. the day before the lecture. I will collate all the responses (with the student's name) and post on Laulima. Please read all the responses and bring a printout to the lecture. This will show collectively what the class understands and what the class does not understand

We will get a grade proportional to your participation effort.

Homework (30% of course grade):

Typically, one homework set per week is assigned on Wednesday and is due in class on the following Wednesday. The idea is that typically students work on homework on weekends; this will allow the students to ask questions before and after they attempt on the homework. Homework assignments will be posted on Laulima.

Homework Answer Format:

In between formulae, there should be narrative explaining what you are doing (pretend you are writing a solution manual). If the grader does not understand what you are doing, the grader cannot give you credits.
I believe that it is very important to recap your steps in solving a problem.
** At the end of each problem, I may ask you to write a summary paragraph to explain how you solved the problem, give reasons to justify your approach. You get credit for these paragraphs. **

Exams (2 Midterms and 1 Final; 60% of course grade)

In-class portion: 15 conceptual questions (30 pts total)
Take-home portion: 2 to 4 calculational problems (70 points total)

** The conceptual question part is cumulative.

A sheet of hand-written note (8.5" x 11") is allowed for the in-class portion.
Take-home exam is open book.

Course Grade Scale:

Based on an absolute scale.

Total (100%) = Homework (30%) + (Midterm 1+ Midterm 2 + Final=(60%)) + Reading summary/question (10%)

The combined % for Midterm 1+ Midterm 2 + Final=60%; the highest score=25%, middle score=20%, lowest score=15%

Grade Scale:

- 96-100 (A+), 91-95 (A), 86-90 (A-)
- 81-85 (B+), 76-80 (B), 71-75 (B-)
- 66-70 (C+), 61-65 (C), 56-60 (C-)
- 51-55 (D+), 46-50 (D), 41-45 (D-)
- <40 (F)
- No "incomplete" (I Grade) will be given.

Student Learning Outcomes:

At the successful completion of this course a student is expected to have:

- A good understanding of Newtonian (non-relativistic) mechanics of a system of particles; the types of approximations needed to render the problems tractable.
- Formulation of mechanics in terms of the Hamilton's principles
- A good understanding of the fundamental difference between non-relativistic and relativistic mechanics
- A set of mathematical skills to solve a variety of problems in mechanics

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