Mechanics: From Oscillations to Chaos
PHYB54H3S
Winter 2024

Professor Hanno Rein

Prerequisites The prerequisites (PHYA21H3, MATB41H3, MATB44H3) as well as the co-requisite (MATB42H3) for this course will be strictly enforced.

Contact Whenever my o ce door (SW504C) is open, I am available to answer your que-

Accessibility Services and need to use an electronic device, please contact me before the start of the term to nd an acceptable arrangement. Note that although this

- Utilize 2-body orbital mechanics to analyze spacecraft trajectories
- Model and analyze simple problems involving vibration with and without damping
- Explore, model and analyze simple problems involving Chaotic system
- Solve di erential equations on a computer
- Visualize trajectories on a computer
- Integrate the equations of motion for a planetary system on a computer

Tentative Tutorial and Class Schedule

Week	Topic
1	Introduction to course and overview of topics Newton's Laws of motion (Chapter 1)
2	Getting started with python and jupyter notebooks Projectiles and Charged Particles (Chapter 2)
3	Plotting tools Momentum and Angular Momentum (Chapter 3)
4	Di erential equation solvers Energy (Chapter 4)
5	Using the scipy ODE solver Oscillations (Chapter 5)
6	Assignment 1 discussion Oscillations (Chapter 5)
7	No tutorial (Reading Week) No lecture (Reading Week)
8	Midterm