Syllabus-PHYS 3122-Mechanics II

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Textbook: “Classical Dynamics” by Stephen T. Thornton and Jerry B. Marion. The book has well designed examples and problems and text is carefully prepared. Most of the homework problems will be assigned from the book. Additional reference textbook “Analytical Mechanics” by Grant R. Fowles and George L. Cassidy

Exams/homework: There will be one hourly test and a final exam. Weekly homework will be assigned and graded.

Final grade = Each exam-40% + HW-20%

The course will cover chapters 7, 8, 9, 10, 11, and 12 from Thornton and Marion.

The subjects to be covered are:

- Lagrangian Mechanics
  - Hamilton’s variational principle
  - Lagrange’s Equations of Motion for conservative systems
  - The Hamiltonian Function

- Mechanics of rigid bodies
  - Moments of inertia
  - Principal axis-dynamic balancing
  - Euler’s Equations of motion of a rigid body

- Dynamics of system of particles.
  - Center of mass
  - Linear and angular momentum of a system
  - Reduced mass, collisions

- Dynamics of oscillating systems
  - Potential energy and equilibrium
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