

ME451

Kinematics and Dynamics of Machine Systems

Dynamics of Planar Systems

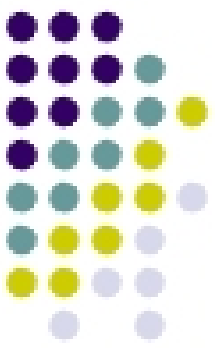
November 29, 2011

Elements of the Numerical Solution of the Dynamics Problem

Chapter 7

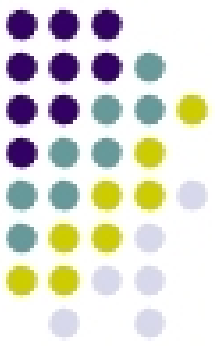


Before we get started...



- Last Time
 - Numerical solution of IVPs
 - Discretization schemes discussed:
 - Explicit: Forward Euler – expeditious but small stability region (can blow up)
 - Implicit: Backward Euler, BDF – requires solution of nonlinear system, typically much more stable than explicit methods
- Today
 - Look at a couple of examples for numerical solution of IVPs
 - Introduce the most basic approach for finding an approximation of the solution of the constrained equations of motion
 - We'll rely on the so called Newmark method
- Miscellaneous
 - Only MATLAB assignment this week
 - Emailed to you this morning, due on Tu, Dec. 6 at 11:59 pm

Exam + Misc. Issues



- Coming up on Thursday, Dec. 1st
 - Lecture at the usual time
 - Review at 5 pm (room TBA)
 - Midterm Exam at 7:15 pm – runs up to two hours long (room TBA)
 - Take home component of midterm exam due on Dec. 8 at 11:59 pm
- Midterm exam deals only with material covered 10/27 through 11/29
 - Dynamics of 2D systems
 - Solution of IVP
 - Numerical solution of the equations of motion
 - Uses material covered today (Newmark integration formula)
- Last day of lecture: Dec. 6
- Final exam is on Sat, Dec. 17 (2:45-4:45 PM)
 - 30-45 mins of questions followed by a problem that needs to be solved with simEngine2D
 - Final exam is comprehensive
- Last week of class dedicated to working on your final projects, which are due on Sat, Dec. 17 at 11:59 PM