

Notes for lecture 9

1. Date: June 9th.
2. Reading: the lecture material is based on Sections 3.5 of Chapter 3 of the main textbook (refer to Chapter3.5.pdf file).
3. The lecture (see LectureNotes9.pdf file) introduces forces and consider dynamics (motion equations) in rectangular coordinate systems. The key points is as follows.
 - a. Free-body diagram.
 - i. If motion of a particle is physically constrained (from being free), the constraints are replaced by reaction forces. Having done that, we then consider the particle as if it were free and moved by the active (such as gravity or other explicitly given force) and reactive forces.
 - b. Forces in curvilinear coordinates.
 - i. When using curvilinear coordinates force vectors shall be represented with respect to moving (changing) coordinate system ($\mathbf{e}_t, \mathbf{e}_n$ for path coordinates, $\mathbf{e}_r, \mathbf{e}_\theta$ for polar coordinates, $\mathbf{e}_r, \mathbf{e}_\theta, \mathbf{e}_z$ for cylindrical coordinates, $\mathbf{e}_r, \mathbf{e}_\theta, \mathbf{e}_\phi$ for spherical coordinates).
4. Ch3D.swf file in the Resources is provided
 - a. When playing the file please do not push Main Menu button; when returning please use Chapter Menu button.
 - b. The content of Ch3D.swf file relevant to this lecture (yellow button corresponding to Introduction; Force, mass and acceleration; c) Normal-tangential coordinates, and d) Polar coordinates)
5. The deadline for submitting assignment (see Quiz9.pdf) is June 16.