98-1 Preliminary Syllabus, Da-Yeh Univ

Information			
Title	高等動力學	Serial No. / ID	1961 / ADR5038
Dept.	機械與自動化工程學系博士班	School System / Class	研究所博士班1年1班
Lecturer	鄭鴻儀	Full or Part-time	專任
Required / Credit	Optinal / 3	Graduate Class	NO
Time / Place	(二)A / H467 (四)BC / H467	Language	English

Introduction

Advanced dynamics is to research the Generalized Coordinates, Constraints, Virtual Displacements and Virtual Work, Generalized Forces, Principles of Virtual Work for Static Equilibrium, D ’ Alembert ’ s Principle, Hamilton ’ s Principles, Lagrange ’ s Equations. In the class basic theorem of the particles and rigid body will be researched.
This course has the goal to cover
1. Provide basic principles and relative motion of particles in moving coordinates.
2. Provide a research of analytical mechanics about basic concepts and advanced concepts of particles.
3. Provide some understanding of the geometry, kinematics, and dynamics of the rigid body.
4. To be familiar with the application of dynamics of rigid bodies for advanced concepts.

Outline

1. Basic Principles
Newtonian Particle Mechanics
Coordinates
a. Rectilinear (Cartesian) Coordinates
b. Curvilinear Coordinates(Cylindrical, Spherical, Mixed)
Work and Engery
2. Relative Motion
3. Analytical Mechanics: Basic Concepts
Generalized Coordinates
Constraints
Virtual Displacements and Virtual Work
Generalized Forces
Principles of Virtual Work for Static Equilibrium
D ’ Alembert ’ s Principle
Hamilton ’ s Principles
Lagrange ’ s Equations
4. Analytical Mechanics: Additional Topics
5. Rigid Body Geometry
6. Rigid Body Kinematics
7. Rigid Body Dynamics: Basic Concepts
8. Dynamics of Rigid Bodies: Advanced Concepts

9. Qualitative Analysis of Rigid Body Motion

Prerequisite
Dynamics, Physics