

# 99-1 Preliminary Syllabus, Da-Yeh Univ

Information			
Title	高等動力學	Serial No. / ID	1571 / MUR5003
Dept.	機械與自動化工程學系碩士班	School System / Class	研究所碩士班1年1班
Lecturer	鄭鴻儀	Full or Part-time	專任
Required / Credit	Optinal / 3	Graduate Class	No
Time / Place	(一)A / H455 (二)AB / H455	Language	Chinese

Introduction
<p>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</p> <ol style="list-style-type: none"> <li>1. Provide basic principles and relative motion of particles in moving coordinates.</li> <li>2. Provide a research of analytical mechanics about basic concepts and advanced concepts of particles.</li> <li>3. Provide some understanding of the geometry, kinematics, and dynamics of the rigid body.</li> <li>4. To be familiar with the application of dynamics of rigid bodies for advanced concepts.</li> </ol>

Outline
<ol style="list-style-type: none"> <li>1. Basic Principles <ul style="list-style-type: none"> <li>Newtonian Particle Mechanics</li> <li>Coordinates <ol style="list-style-type: none"> <li>a. Rectilinear (Cartesian) Coordinates</li> <li>b. Curvilinear Coordinates(Cylindrical, Spherical, Mixed)</li> </ol> </li> <li>Work and Engery</li> </ul> </li> <li>2. Relative Motion</li> <li>3. Analytical Mechanics: Basic Concepts <ul style="list-style-type: none"> <li>Generalized Coordinates</li> <li>Constraints</li> <li>Virtual Displacements and Virtual Work</li> <li>Generalized Forces</li> <li>Principles of Virtual Work for Static Equilibrium</li> <li>D ' Alembert ' s Principle</li> <li>Hamilton ' s Principles</li> <li>Lagrange ' s Equations</li> </ul> </li> <li>4. Analytical Mechanics: Additional Topics</li> <li>5. Rigid Body Geometry</li> <li>6. Rigid Body Kinematics</li> <li>7. Rigid Body Dynamics: Basic Concepts</li> <li>8. Dynamics of Rigid Bodies: Advanced Concepts</li> </ol>

## 9. Qualitative Analysis of Rigid Body Motion

Prerequisite

Dynamics, Physics