

## Class Syllabus – Spring Semester, 114 Academic Year

### Department of Mechanical Engineering, National Chung Cheng University

Course Name : Applied Mechanics II - Dynamics				Dept.		IBPME
				Course Code		4231051
Instructors	I-Ling Chang	Credits	3	Compulsory	Grade	First grade
EMI	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
Course type	<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Humanistic Care Course  <input checked="" type="checkbox"/> Problem-oriented Course  <input type="checkbox"/> Integrate the curriculum  <input type="checkbox"/> Internship         </div> <div> <input type="checkbox"/> Competition Special Course  <input type="checkbox"/> Topic-based courses  <input type="checkbox"/> Practical courses  <input type="checkbox"/> Other         </div> </div>					
<p>Prerequisites : A basic understanding of Newtonian mechanics, vector algebra, and elementary calculus.</p> <p>Class Description : This course introduces mathematical models of particle and rigid body dynamics, enabling students to analyze and design the motion of real-world mechanical systems.</p> <p>Class Objective : The objective of this course is to develop students' understanding of the fundamental principles and analytical models of particle and rigid body dynamics, to train them in applying these methods to analyze the motion of mechanical systems, and to strengthen their theoretical and practical skills through engineering case studies.</p>						
Textbooks	Engineering Mechanics – Dynamics (R.C. Hibbeler) 14th Edition in SI units, 2017. (Global Edition)					
An overview of the main points of teaching						
Teaching Materials	<div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> PPT  <input type="checkbox"/> Self-edited textbooks  <input checked="" type="checkbox"/> Self-made instructional videos         </div> <div> <input checked="" type="checkbox"/> Course handouts  <input type="checkbox"/> Teaching Procedures  <input type="checkbox"/> Other         </div> </div>					
Teaching Methods	<div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> Lectures  <input type="checkbox"/> Oral presentation  <input type="checkbox"/> Case studies         </div> <div> <input type="checkbox"/> Group discussion  <input type="checkbox"/> Problem-oriented learning  <input type="checkbox"/> Other         </div> </div>					
Evaluation Tools	<div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> Mid-term Exam  <input checked="" type="checkbox"/> In-class Quiz  <input type="checkbox"/> Homework  <input type="checkbox"/> Final Report  <input type="checkbox"/> Other         </div> <div> <input checked="" type="checkbox"/> Final Exam  <input type="checkbox"/> In-class homework  <input type="checkbox"/> Mid-term Report  <input type="checkbox"/> Special Report  <input type="checkbox"/> Scales         </div> </div>					
Teaching Resources	<input checked="" type="checkbox"/> Course website <input checked="" type="checkbox"/> Electronic files of textbooks are available for download <input type="checkbox"/> Internship website					

Instructor's Information		ilchang@mail.ncku.edu.tw				
Course Outlines		Teaching Hours				Core Competence
Unit Title	Contents	Lectures	Demo	Practice	Other	
<i>Kinematics of a Particle</i>	Dynamics (R.C Hibbeler) Ch. 12	8				B1, B5, B6
<i>Kinetics of a Particle: Force and Acceleration</i>	Dynamics (R.C Hibbeler) Ch. 13	6				B1, B5, B6
<i>Kinetics of a Particle: Work and Energy</i>	Dynamics (R.C Hibbeler) Ch. 14	6				B1, B5, B6
<i>Kinetics of a Particle: Impulse and Momentum</i>	Dynamics (R.C Hibbeler) Ch. 15	6				B1, B5, B6
<i>Planar Kinematics of a Rigid Body</i>	Dynamics (R.C Hibbeler) Ch. 16	8				B1, B5, B6
<i>Planar Kinematics of a Rigid Body: Force and Acceleration</i>	Dynamics (R.C Hibbeler) Ch. 17	8				B1, B5, B6
<i>Planar Kinematics of a Rigid Body: work and Energy</i>	Dynamics (R.C Hibbeler) Ch. 18	6				B1, B5, B6
<i>Planar Kinematics of a Rigid Body: Impulse and Momentum</i>	Dynamics (R.C Hibbeler) Ch. 19	6				B1, B5, B6
Achievable Core Competence		Achievable Objective				
B1	Possess the ability of basic engineering mathematics, solid mechanics, heat flow mechanics, automatic control, materials science and opto-mechanical integration engineering practical analysis	Possess the ability of basic engineering mathematics and kinetic analysis				
B5	Mechanical and opto-electromechanical systems, component design and process planning capabilities	It has the ability to design mechanical mechanism systems and power components				
B6	Ability to identify, analyse and solve professional problems	The ability to discover, analyze, and solve dynamics-related problems (integration with physical phenomena, dynamic balance, energy balance, etc.)				

### Core competencies of the University Division

B1 Possess the ability of basic engineering mathematics, solid mechanics, heat flow mechanics, automatic control, materials science and opto-mechanical integration engineering practical analysis

B2 Ability to absorb and integrate cross-domain knowledge

B3 Ability to perform solid force experiments, heat flow experiments, mechanical project implementation, optoelectronic engineering experiments and analyze data

B4 Ability to write programming languages and computer-aided design

B5 Mechanical and opto-electromechanical systems, component design and process planning capabilities

B6 Ability to identify, analyse and solve professional problems

B7 Ability to implement and innovate

B8 Ability to engage in scientific writing and presentations

B9 Ability to work as a team, communicate effectively and manage the program

B10 Learn general knowledge and demonstrate the ability of engineering ethics, social responsibility and sustainable development

Weekly teaching plan				
Course Time	Course Location	Grading	Office hour	Teaching quality evaluation method
Wed. 4:10pm- 7:00pm	ME 117	Homework 10%( Including attendance) Mid-term Exam (I) 30% Mid-term Exam (II) 30% Final exam 30%		Questionnaire
Weeks	Teaching & Homework Progress			Note
1	Ch.12 Kinematics of a particle			
2	Ch.12 Kinematics of a particle			
3	Ch.12 Kinematics of a particle			
4	Ch. 13 Kinetics of a particle			
5	Ch. 13 Kinetics of a particle			
6	Ch. 13 Kinetics of a particle			Mid-term (I)
7	Ch.16 Kinematics of a rigid body of particle			
8	Ch.16 Kinematics of a rigid body of particle			
9	Ch.16 Kinematics of a rigid body of particle			
10	Ch. 17 Kinetics of a rigid body			
11	Ch. 17 Kinetics of a rigid body			
12	Ch. 17 Kinetics of a rigid body			Mid-term (II)
13	Ch.18 Work and energy of rigid body			
14	Ch.18 Work and energy of rigid body			
15	Ch.18 Work and energy of rigid body			
16	Ch. 19 Impulse and momentum of rigid body			
17	Ch. 19 Impulse and momentum of rigid body			
18	<b>Final Exam</b>			

