國立中正大學機械工程學系 115 學年度第一學期教學大綱表

<table>
<tr><td colspan="5">課程名稱：(中文) 中等流體力學
(英文) Intermediate Fluid Dynamics</td><td>開課單位</td><td>機械系</td></tr>
<tr><td colspan="5"></td><td>課程代碼</td><td>4205601</td></tr>
<tr><td>授課教師</td><td>李建興</td><td>學分數</td><td>3</td><td>選修</td><td>開課年級</td><td>大四/碩博士班</td></tr>
<tr><td>全英文授課
EMI</td><td colspan="6">■是 □否</td></tr>
<tr><td colspan="7">先修科目或先備能力： Basic knowledge of Fluid Mechanics</td></tr>
<tr><td colspan="7">課程概述：
This course explores fluid mechanics principles, including mass, momentum, energy conservation, and fluid mechanics, from basic fluid mechanics and solid mechanics. Students will develop solid analytical skills and apply knowledge to fluid machinery design. Students can be advanced in the design and function of fluid machinery improvement.
目標：
1. Students will learn the knowledge of fluid mechanics, skills and sub-laws.
2. Students will have the ability to obtain solutions to fluid mechanics problems.</td></tr>
<tr><td>教科書</td><td colspan="6">1. “Munson, Young and Okiishi's Fundamentals of Fluid Mechanics” by A. L. Gerhart, J. I. Hochestein, P. M. Gerhart, 9th Edition, John Wiley & Sons Inc.
2. Reference book: “Mechanics of Fluids” by Merle C. Potter, David C. Wiggert, 3rd Edition, 2002, Brooks/COLE
3. Reference book: “Fundamentals of Gas Turbines” by WILLIAM W.BATHIE, 2nd Edition, 1996, John Wiley & Sons Inc.
「請尊重智慧財產權，不得非法影印教師指定之教科書籍」</td></tr>
<tr><td colspan="7">教學要點概述</td></tr>
<tr><td>教材編選
teaching materials</td><td colspan="6">□ 自製簡報(ppt) ■課程講義 □自編教科書
□ 教學程式 □自製教學影片 □其他</td></tr>
<tr><td>教學方法
teaching methods</td><td colspan="6">■講述 □小組討論 □學生口頭報告 ■問題導向學習
□個案研究 □其他</td></tr>
<tr><td>評量工具
Evaluation tools</td><td colspan="6">■期中考 ■期末考 □隨堂測驗 □隨堂作業
■課後作業 □期中報告 □期末報告 □專題報告
□評量尺規 □其他</td></tr>
<tr><td>教學資源
teaching resources</td><td colspan="6">□課程網站 ■教材電子檔供下載 □實習網站</td></tr>
<tr><td>教師相關訊息
instructor’s information</td><td colspan="6">TEL：(05) 272-0411 -33315
Email: chienshing@ccu.edu.tw</td></tr>
<tr><td colspan="2">課程大綱</td><td colspan="4">分配時數</td><td rowspan="2">可達成核心能力</td></tr>
<tr><td>單元主題</td><td>內容綱要</td><td>講授</td><td>示範</td><td>習作</td><td>其它</td></tr>
</table>

Integral forms of the Fundamental Laws	1. System to control volume Transformation 2. Conservation of Mass, Momentum, and Energy	6				D1, D2, D4
Differential Forms of the Fundamental Laws	1. Continuity Equation 2. Momentum Equation 3. Energy Equation	6				D1, D2, D4
Internal Flow	1. Entrance Flow and Developed Flow 2. Laminar Flow in Pipe 3. Laminar Flow between Parallel Plates 4. Laminar Flow between Rotating Cylinders 5. Turbulent Flow in a Pipe	6				D1, D2, D4
External Flow	1. Flow Around Immersed Bodies 2. Lift and Drag on Air Foils 3. Boundary Layer Theory	6				D1, D2, D4
Compressible Flow	1. Isentropic Nozzle Flow 2. Normal Shock Wave 3. Shock Waves in Converging-Diverging Nozzles 4. Oblique Shock Wave 5. Isentropic Expansion Waves	6				D1, D2, D4
Turbomachines	1. Use of Turbopumps in Piping Systems 2. Turbines	6				D1, D2, D4

可達成核心能力		核心能力達成指標
D1	具機械與光機電整合工程領域之專業知識	具進階流體力學分析之專業知識
D2	策劃及執行機械及光機電整合工程領域專題研究之能力	策劃及執行流體力學分析及相關領域專題研究之能力
D4	創新思考與獨立解決機械與光機電整合工程問題之能力	創新思考與獨立解決流體力學分析相關問題之能力

教學要點概述:

上課時間	上課地點	評量方式	Office hour	教學品質評量方式
Friday 10:10~13:00	Engineering Building II 213	Homework 40% Midterm 30% Final 30%	Friday 14:00-16:00	教學意見調查核心能力重要性及達成度分析問卷

週次	教　學　與　作　業　進　度	備　註
1-2	Integral forms of the Fundamental Laws	

3-4	Differential Forms of the Fundamental Laws	
5-6	Internal Flow	
7-8	Internal Flow/External Flow	
9	(Midterm exam)	Midterm exam
10-11	External Flow	
12-13	Compressible Flow	
14-15	Compressible Flow	
16	(Final exam)	Final exam
17-18	Turbomachines (Flexible weeks)	
Other:		