

Syllabus of CCUME, 2025 Academic Years, 2nd Semester

課程名稱：(中文) 機械製造 (英文) Manufacturing Processes					Course Department ME	4222151-02 4212355-02(選)
					Course Code	
Instructor	Rong-Shine Lin 林榮信 Yi-Hung Chen 陳翼弘	Credit Hrs.	3	Required Course	Course Level	2 nd year
全英文授課 EMI	☒ 是 ☐ 否					
課程類別 course type	☐ 人文關懷課程 ☐ 專題導向課程 ☐ 實習 ☐ 競賽專題課程 ☐ 總整課程 ☐ 其他 ☒ 問題導向課程 ☐ 實作課程					
Prerequisite(s) : Calculus						
Course Description: This course covers the diverse topics of manufacturing processes. The fundamentals of materials, mechanical behavior and manufacturing properties will be the core of our course, focusing on metal casting processes, material removal processes, forming processes, and Advanced manufacturing processes. Objectives: Students completing this course should be able to understand the fundamental theories and applications for conventional manufacturing processes, as well as advanced processes.						
Textbook	“Fundamentals of Modern Manufacturing – Materials, Processes, and Systems,” by Mikell P. Groover, 7 th edition, Wiley, 2022.					
教學要點概述						
教材編選 teaching materials	☐ 自製簡報(ppt) ☐ 教學程式 ☒ 課程講義 ☐ 自製教學影片 ☐ 自編教科書 ☐ 其他					
教學方法 teaching methods	☒ 講述 ☐ 個案研究 ☐ 小組討論 ☐ 其他 ☐ 學生口頭報告 ☐ 問題導向學習					
評量工具 Evaluation tools	☒ 期中考 ☐ 課後作業 ☐ 評量尺規 ☒ 期末考 ☐ 期中報告 ☐ 其他 ☐ 隨堂測驗 ☐ 期末報告 ☐ 隨堂作業 ☐ 專題報告					
教學資源 teaching resources	☒ 課程網站 ☒ 教材電子檔供下載 ☐ 實習網站					
教師相關訊息 instructor's information	Rong-Shine Lin 林榮信, Rm 426, Ext.33300, e-mail: imelin@ccu.edu.tw Yi-Hung Chen 陳翼弘, Rm 527, Ext.33319, e-mail: yihungchen@ccu.edu.tw					
Course Outline			Hours			Achievable Core Competence of Course
Topic	Contents	Lecture	Demonstration	Assignments	Other	

The fundamentals of materials, mechanical behavior, and manufacturing properties	1. Mechanical properties 2. Tensile 3. Compression 4. Torsion	8				B1, B2, B5, B6
Solidification processes	1. Fundamental of metal Casting 2. Expendable Mold Casting 3. Permanent Mold Casting	9				B1, B2, B5, B6
Metal Forming Processes	1. Fundamental of Metal Forming 2. Bulk Deformation 3. Sheet Metal Working	9				B1, B2, B5, B6
Material Removal Processes	1. Theory of Metal Machining 2. Machining Tools 3. Cutting Tool Technologies	9				B1, B2, B5, B6
Welding Processes	1. Theory of Welding 2. Processes	9				B1, B2, B5, B6
Additive Manufacturing processes	1. Introduction to AM 2. AM Processes	8				B1, B2, B5, B6
Achievable Core Competence of Course		Achievable Indicators of Core Competence				
B1	具備基本工程數學、固體力學、熱流力學、自動控制及材料科學分析的能力	具備基本機械製造專業知識的能力				
B2	吸收跨領域知識與整合的能力	吸收與整合機械製造跨領域知識的能力				
B5	機械系統、元件設計與製程規劃的能力	機械元件製程規劃的能力				
B6	發掘、分析及解決專業問題的能力	發掘、分析及解決機械製造專業問題的能力				

教學要點概述：Manufacturing Processes				
Session	Location	Evaluation	Office hour	Assessment of Teaching quality
二 F 四 F 14:45-16:00	ME 214 右	Midterm 1, 25% Midterm 2, 25% Midterm 3, 25% Midterm 4, 25% Q/A, 10%	Mon. 10:00-11:00	1. Student Evaluation of Teaching 2. Questionnaire on the Level of Achievement of Core Competence
Week	Subject & Homework			Remarks
1	Introduction to Manufacturing Processes			Ex#1
2	Mechanical Properties			Ex#2

3	Property Tests	
4	Fundamentals of Metal Forming	Ex#3
5	Bulk Deformation Processes	Midterm 1
6	Sheet Metal Working Processes	
7	Theory of metal machining	Ex#4
8	Machining operations and Machine Tools	
9	Cutting Tool Technology, Machining Ability, and Surface Finish	Midterm 2
10	Fundamentals of metal casting	Ex#5
11	Metal casting processes	
12	Shaping process for plastics	
13	Theory of Welding	Ex#6
14	Welding processes	Midterm 3
15	Additive Manufacturing	Ex#7
16	AM Processes	
17	Hands on project	
18	Final Exam	Midterm 4
Other: English is the official language in this course.		