

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	
					Course Code	4202251	
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	<input checked="" type="checkbox"/> 是 <input type="checkbox"/> 否						
課程類別 course type	<input type="checkbox"/> 人文關懷課程 <input type="checkbox"/> 競賽專題課程 <input checked="" type="checkbox"/> 問題導向課程 <input checked="" type="checkbox"/> 專題導向課程 <input type="checkbox"/> 總整課程 <input type="checkbox"/> 實作課程 <input type="checkbox"/> 實習 <input type="checkbox"/> 其他						
Prerequisite(s) : Calculus							
<p>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.</p> <p>Objectives: Students completing this course should be able to understand the fundamental theories and applications for conventional manufacturing processes, as well as advanced processes.</p>							
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	<input type="checkbox"/> 自製簡報(ppt) <input checked="" type="checkbox"/> 課程講義 <input type="checkbox"/> 自編教科書 <input type="checkbox"/> 教學程式 <input type="checkbox"/> 自製教學影片 <input type="checkbox"/> 其他						
教學方法 teaching methods	<input checked="" type="checkbox"/> 講述 <input type="checkbox"/> 小組討論 <input type="checkbox"/> 學生口頭報告 <input type="checkbox"/> 問題導向學習 <input type="checkbox"/> 個案研究 <input type="checkbox"/> 其他						
評量工具 Evaluation tools	<input checked="" type="checkbox"/> 期中考 <input checked="" type="checkbox"/> 期末考 <input type="checkbox"/> 隨堂測驗 <input type="checkbox"/> 隨堂作業 <input type="checkbox"/> 課後作業 <input type="checkbox"/> 期中報告 <input type="checkbox"/> 期末報告 <input type="checkbox"/> 專題報告 <input type="checkbox"/> 評量尺規 <input type="checkbox"/> 其他						
教學資源 teaching resources	<input checked="" type="checkbox"/> 課程網站 <input checked="" type="checkbox"/> 教材電子檔供下載 <input type="checkbox"/> 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

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				

大學部核心能力(請檢視)

B1 具備基本工程數學、固體力學、熱流力學、自動控制、材料科學及光機電整合工程實務分析的能力

B2 吸收與整合跨領域知識的能力

B3 執行固力實驗、熱流實驗、機械專題實作、光電工程實驗和分析數據的能力

B4 撰寫程式語言與電腦輔助設計的能力

B5 機械與光機電系統、元件設計及製程規劃的能力

B6 發掘、分析及解決專業問題的能力

B7 具備實作與創新的能力

B8 從事科技寫作和報告展演的能力

B9 團隊合作、有效溝通及計畫管理的能力

B10 學習通識、體現工程倫理、社會責任與永續發展的能力

教學要點概述： Manufacturing Processes

Session	Location	Evaluation	Office hour	Assessment of Teaching quality
A : Tu., Th. 8:45-10:00 B : Tu., Th.. 14:45-16:00	ME 214 R	Midterm 1, 30% Midterm 2, 30% Quizzes, 30% Project, 10% 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			
6	Sheet Metal Working Processes			
7	Theory of metal machining			Ex#4
8	Machining operations and Machine Tools			Midterm I
9	Fundamentals of metal casting			
10	Metal casting processes			Ex#5
11	Theory of Welding			
12	Welding processes			Ex#6
13	Additive Manufacturing			
14	AM Processes			Ex#7
15	Hands on project			
16	Final Exam			Midterm II
Other: English is the official language in this course.				