Syllabus of CCUME, 2025 Academic Years, 2nd Semester

<table>
<tr><td colspan="5">課程名稱：(中文) 機械製造
(英文) Manufacturing Processes</td><td>Course Department</td><td>ME</td></tr>
<tr><td colspan="5"></td><td>Course Code</td><td>4222151-01
4212355-01(選)</td></tr>
<tr><td>Instructor</td><td>Rong-Shine Lin
林榮信
Yi-Hung Chen
陳翼弘</td><td>Credit Hrs.</td><td>3</td><td>Required Course</td><td>Course Level</td><td>2nd year</td></tr>
<tr><td>全英文授課
EMI</td><td colspan="6">■是 □否</td></tr>
<tr><td>課程類別
course type</td><td colspan="6">□ 人文關懷課程 □ 競賽專題課程 ■ 問題導向課程
□ 專題導向課程 □ 總整課程 □ 實作課程
□ 實習 □ 其他</td></tr>
<tr><td colspan="7">Prerequisite(s)：Calculus</td></tr>
<tr><td colspan="7">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.</td></tr>
<tr><td>Textbook</td><td colspan="6">“Fundamentals of Modern Manufacturing – Materials, Processes, and Systems," by Mikell P. Groover, 7th edition, Wiley, 2022.</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">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</td></tr>
<tr><td colspan="2">Course Outline</td><td colspan="4">Hours</td><td rowspan="2">Achievable Core Competence of Course</td></tr>
<tr><td>Topic</td><td>Contents</td><td>Lecture</td><td>Demonstration</td><td>Assignments</td><td>Other</td></tr>
</table>

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 B 四 B 8:45-10:00	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.		