國立中正大學前瞻製造中心學系 109 學年度第 2 學期教學大綱表

Syllabus - Virtual Manufacturing and Its Applications

課程名稱：(中文) 虛擬製造與應用 (英文) Virtual Manufacturing and Its Applications					開課單位	AIMHI
					課程代碼	4456245_01
授課教師	楊志慶	學分數	3	選修	開課年級	研究所

先修科目或先備能力: Basic knowledge of machining processes, and CAD/CAM/CAE experiences

Overview:

The objective of this course is to introduce the concept of virtual manufacturing and its applications in product design and manufacturing; specifically, on Computer-Aided Process Planning for Cycle time reduction and Computer-Aided Engineering for quality verification. Students will understand how to use computer simulation/analysis technologies to integrate product design and manufacturing. Critical elements for conducting virtual manufacturing will be reviewed and discussed in detail.

Objectives:

To help students gain hands-on experiences on creating, evaluating, and analyzing the processes of a specific product and establish a solid foundation of conducting virtual manufacturing applications

Text book	1. Papers related to specific topics.

課程大綱 Syllabus		分配時數 Hours				可達成核心能力
單元主題	內容綱要	講授	示範	習作	其它	
Introduction	The definition of virtual manufacturing and its applications	6				D1, D2, D4, D8
Key Elements of Virtual Manufacturing	Cutting Force System 2D/3D Cutting Mechanics Calculation of Cutting Forces	6				D1, D2, D4, D8
Process Planning Procedures	Thermal Energy Temperature Measurement and Calculation Tool Wear/Life	27				D1, D2, D4, D8
Role of CAE	Type of Vibration in Machining Vibration Control	6				D1, D2, D4, D8
Process Planning	Cutting Process Simulation Impact of Part Quality	6				D1, D2, D4, D8
Term Project	Case Study and Presentation	3				D1, D2, D3, D4, D5, D8

可達成核心能力		核心能力達成指標
D1	具機械領域之專業知識	Be able to integrate machining theory into practice
D2	策劃及執行機械及其相關領域專題研究之能力	Capable of conducting further research in the field of machining
D3	撰寫機械專業論文之能力	Be able to write and present papers thru case study training
D4	創新思考及獨立解決機械問題之能力	Be able to identify practical machining issues and provide direction for solution
D5	與不同領域人員協調整合之能力	Be able to discuss with experts in different areas related to machining analysis
D8	終身自我學習成長之能力	Be able to identify opportunities for future fundamental machining research

Notes:				
Class Time	Classroom	Scoring	Office hour	Evaluation
Fri.9:00-12:00	I-222	In-class Performance 40% Mid-Term Report 30% Final Presentation 30%	Wednesday 10:00-11:00am Room: 232 Tel: +886-5-310-6267 E-mail:aimhijy@ccu.edu.tw	Questionnaire is used to investigate the lecturing and student learning outcomes

Weeks	Course Outlines	Remarks
1	Introduction of Virtual Manufacturing	
2	Applications of Virtual manufacturing	
3	Introduction of NX and Project	
4	Key Element- Feature Recognition & Hands-on Exercise	
5	Key Element- Tooling Database & Hands-on Exercise	
6	Key Element- Machining Practice & Hands-on Exercise	
7	Key Element- Process Planning & Hands-on Exercise	
8	Key Element- Process Planning & Hands-on Exercise	
9	Mid-Term Report/Presentation & Hands-on Exercise	
10	Key Element- Post-Process and Output & Hands-on Exercise	
11	Integration of CAE and CAPP	
12	Integration of CAE and CAPP	
13	Case Study of CAE	
14	Case Study of CAE	
15	CAE Report and Presentation	
16	Final Report and Presentation	
17	Final Report and Presentation	
18	Group Discussion	
Others: 本課程以全英文授課。English is the official language in this course		