National Chung Cheng University Graduate Institute of Opto-Mechatronics, Department of Mechanical Engineering 111 academic year first semester Syllabus

Course Title：(中文) 光機系統設計(Taught in English) (English) Optomechatronic System Design		Department	Graduate Institute of Opto-Mechatronics, Department of Mechanical Engineering
		Course code	4415098
teacher	Hsiang-Chen Wang	grade	1.st
prerequisites： Optics			
overview： Explain the basic principles of Optomechatronic System Design, and introduce related tools and methods objective： Let students have a complete understanding of the basic principles of Optomechatronic System Design, and can further use related tools and software			
textbook	**1.** Optical System Design / Bobert E. Fischer, Biljana Tadic-Galeb/ McGraw-Hill Company, 2001 2. Fundamentals of photonics /Bahaa E.A. Saleh, Malvin Carl Teich. / Hoboken, N.J. :Wiley ;c2007.Chichester :John Wiley **3.** Modern optical engineering :the design of optical systems /Warren J. Smith/ New York :McGraw Hill,c2000 **4.** Elements of modern optical design /Donald C. O'Shea / New York :Wiley,c1985		

Course Outline		Hour distribution				Core competence
theme	Summary	lecture	demonstration	exercise	others	
Geometrical optics	Imaging formula、Basic parameters of Optomechatronic System、classification of Optical system	9				D1、D2、D3、D4、D5、D6
Imaging system	The main principle of the imaging system、Image quality、Aberration、Diffraction	9				D1、D2、D3、D4、D5、D6
Optical system components	Introduction to Optical Materials、Lens selection、Spherical and aspherical mirrors	9				D1、D2、D3、D4、D5、D6
Optical system design	form design、step、Gaussian beam imaging、Diffraction optics、Lighting system design、Endurance and manufacturing parameters、Polarized light design、Optical film	12	4	2		D1、D2、D3、D4、D5、D6、D7、D8、D9

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	具光機系統設計之專業知識

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	策劃及執行光機系統設計專題研究之能力
D3	撰寫科技論文與簡報之能力	撰寫光機系統設計之能力
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光機系統設計問題之能力
D5	跨領域人員協調整合之能力	跨領域人員協調整合之能力
D6	良好的國際觀	國際科技觀
D7	具備團隊合作精神及領導、管理、規劃、溝通之能力	具備團隊合作精神及溝通之能力
D8	終身自我學習成長之能力	線上學習之能力
D9	瞭解工程倫理與社會責任之重要性	策劃及執行光機系統設計專題研究之能力

notes：1.the column “others” Including visits, speeches and other activities。

Overview of teaching points:			
class time	Monday 14:10~17:10	class locations	創新大樓 222 室
Scoring method	Homework 30% Midterm exam 30% Final exam 40% Attend 0 % 「Teachers have the right to reserve, modify, and change the details of the course grading standards, depending on the actual situation of the class.。」	Office hour	every Wednesday 14:00~17:00 Tel: (05)2720411#33601 E-mail: hcwang@ccu.edu.tw

Week	Teaching and homework progress	notes
1	Basic Optics Equations for Ray Optics	
2	Image Quality	
3	OPD and Aberration Corrections I	
4	Glasses Selection	
5	Spherical and Aspheric Surface	
6	Design forms	
7	The optical design process	
8	Computer performance evaluation	

9	Gaussian beam imagery	
10	Mid-term exam	
11	Diffractive optics	
12	Design of illumination systems	
13	Diffractive Optics	
13	Photonics Devices	
14	Polarization and Optical Thin Films	
15	Tolerancing and Productivity	
16	Case Studies Examples	
17	Case Studies Examples	
18	Final exam	
else:		