課程大綱及進度表

開課系所	資訊工程學系
開課學年	112
開課學期	1
課程名稱(中文)	影像處理
課程名稱(英文)	Digital Image Processing
課程碼	P755000
分班碼	
先修科目或先備能力	None
學分數	3
開課教師	洪昌鈺
e-mail	z11208015@mail.ncku.edu.tw
電話	(06)2757575 ext.62562
Office Hours	**Thursday** 14:00~17:00
課程概述	Digital image processing has become one of the most popular courses in computer science and electrical engineering. The techniques of digital image processing have been rapidly developed and widely adopted in tremendous applications. This course gives a series of introductory lectures on the basic theories and implementations of digital image processing techniques. The major topics cover Digital Image Fundamentals, Image Enhancement, Image Restoration, Color image processing, Segmentation.The course work includes programming assignments and one examination. It is a fundamental course for digital image processing.
教學目標	This course gives a series of introductory lectures on the basic theories and implementations of digital image processing techniques.
授課課程大綱明細	1. Week 1: Introduction to Image Processing (Ch1) 2. Week 2: Digital Image Fundamentals (Ch2.1~Ch2.3) 3. Week 3: Image

	enhancement spatial domain 4. Week 4: Image Enhancement in the Spatial or frequency Domain 5. Week 5: Image Enhancement in the Frequent Domain 6. Week 6: Image Restoration (1) 7. Week 7: Image Restoration (2) 8. Week 8: Color image processing Domain (Ch4.4~Ch4.6) 9. Week 9: Midterm Examination 10. Week 10: Image segmentation (1) 11. Week 11: Image segmentation (2) 12. Week 12: Image Segmentation (3) 13. Week 13: Color Image Processing 14. Week 14: deep learning in image processing (1) 15. Week 15: deep learning in image processing (2) 16. Week 16: deep learning in image processing (3) 17. Week 17: Final examination Week 18: Final Project Demo
參考書目	1. R.C Gonzalez and R.E. Woods, Digital Image Processing, 2nded., Prentice Hall, 2002. 2. M. Sonka, V. Hlavac, and R. Boyle, Image Processing, Analysis, and Machine Vision, PWS Publishing, USA, 1999. 3. A. McAndrew, Introduction to Digital Image Processing with Matlab, Thomson course technology, 2004. 4. L.W. MacDonald & M.R. Luo, Color Image Science, John Wiley & Sons, Ltd, 2002. 5. W.K. Pratt, Digital Image Processing, 3rd ed., Wiley inter-science, 2001. 6. I. Pitas, Digital Image Processing Algorithms and Applications, John Wiley & Sons, 2000. 7. A. Watt and F. Policarpo, The

	Computer Image, Addison-Wesley, 1998. 8. A.K. Jain, Fundamentals of Digital Image Processing, Prentice Hall,1989. 9. R.M. Haralick and L.G. Shapiro, Computer and Robot Vision, Vol.'s I & II, Addison-Wesley, 1992.
課程要求	None
評量方式	Two examination (50%) One assignment (20%) One Project (30%)
課程網址	
助教資訊	
備註	

● 該課程成績評量參考之指標，請勾選（可複選）：

□紙筆測驗	■書面報告	□口頭報告
□課堂問答	■實作表現	□上課表現
■指定作業	□專題研究	□課堂出席
□其他(請簡述)_____		

● 修習本課程後，學生是否可獲得以下核心能力，請勾選 (可複選)：

■ 具備多媒體系統及智慧型運算跨領域專業知識及終身學習之能力
■ 具備獨立研究、設計及創新之能力
□ 優質團隊合作及國際觀之能力

● 課程規劃是否考量產業需求：

■ 是 □ 否

● 請老師說明此課程與產業需求之關係：

許多以往需要人工判讀結果的產業常有人為判讀失誤、人力消耗、以及所需工時長的問題。在考量到方便性與普遍性後，許多產業都漸漸投入影像處理方面的技術，試圖減低人力消耗、提高效率與準確度來完成工作。但是，由於自然界仍有許多因素會影響影像的品質進而造成判斷的誤差，如何提供一個準確、可靠又快速的影像處理系統是現階段許多產業所積極研究的一項目標。

● 請問老師如何培養學生將所學應用在工程實務的能力?

在課程中，學生將會學習到影像處理的相關技術。除了期末考之外，修習本課程的學生在期中考前須將課堂上所學的一些基礎影像處理的技術實作出來；另外，將會有一項與近期研究發展相關的題目做為期末 project，提供學生有應用所學的知識與技術去解決問題的機會。