



## 教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	影像處理		學年/學期 Academic Year/Semester	114/2
課程名稱(英文) Course Name in English	Image Processing			
科目代碼 Course Code	CSIEM0180	系級 Department & Year	碩士	開課單位 Course-Offering Department
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)	3.0/3.0	
授課教師 Instructor	/張意政			
先修課程 Prerequisite				
課程描述 Course Description				
<p>This course aims to provide fundamental knowledge in digital image processing and related fields. Students will learn the core principles and practical techniques required to design and implement imaging systems.</p> <p>Topics include digital image fundamentals; image enhancement in the spatial and frequency domains; image restoration; color image processing; image compression; image segmentation; and image representation and description. An introduction to deep learning-based approaches for image analysis is also covered.</p>				
課程目標 Course Objectives				
<p>The aim of this course is to provide the fundamental knowledge of image processing and the corresponding fields.</p> <p>After learning the course, students will have the ability to develop the techniques needed in an imaging system.</p> <p>The content of the course contains digital image fundamentals, image enhancement in the spatial/frequency domain, image restoration, color image processing, image compression, image segmentation, and description. Deep learning is also mentioned in the course.</p>				
系專業能力 Basic Learning Outcomes				課程目標與系專業能力相關性 Correlation between Course Objectives and Dept.'s Education Objectives
A	統合資工知識技術之能力Ability to integrate knowledge and technologies of computer science and information engineering.			●
B	設計技術理論驗證實驗之能力Ability to design and conduct science experiments and to validate hypotheses.			●
C	資訊軟硬體設計開發之能力Ability to design and develop computer software and hardware.			○
D	團隊專案開發之能力Ability to design and develop team projects.			●
E	批判性思考與創新研發之能力。Ability of analytical thinking, creative research planning, and innovative development.			○
圖示說明Illustration : ● 高度相關 Highly correlated ○ 中度相關 Moderately correlated				
授課進度表 Teaching Schedule & Content				
週次Week	內容 Subject/Topics			備註Remarks
1	Introduction Digital Image Processing			

2	Digital Image Fundamentals	
3	Image Enhancement in the Spatial Domain	
4	Image Enhancement in the Frequency Domain I	
5	Image Enhancement in the Frequency Domain II	
6	Image Restoration	
7	Color Image Processing	
8	Image Compression	
9	期中考試週 Midterm Exam	
10	Proposal Presentation	
11	Image Segmentation	
12	Morphological Image Processing	
13	Representation and Description	
14	Object Recognition	
15	Neural Networks	
16	Paper and Project Presentation I	
17	Paper and Project Presentation II	
18	Flexible supplementary instruction and students' self-directed learning.	

教學策略 Teaching Strategies

- 課堂講授 Lecture                     
 分組討論 Group Discussion                     
 參觀實習 Field Trip  
 其他 Miscellaneous:

教學創新自評 Teaching Self-Evaluation

創新教學 (Innovative Teaching)

- 問題導向學習 (PBL)                     
 團體合作學習 (TBL)                     
 解決導向學習 (SBL)  
 翻轉教室 Flipped Classroom                     
 磨課師 Moocs

社會責任 (Social Responsibility)

- 在地實踐 Community Practice                     
 產學合作 Industry-Academia Cooperation

跨域合作 (Transdisciplinary Projects)

- 跨界教學 Transdisciplinary Teaching                     
 跨院系教學 Inter-collegiate Teaching

- 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

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學期成績計算及多元評量方式 Grading & Assessments

配分項目 Items	配分比例 Percentage	多元評量方式 Assessments							
		測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
平時成績(含出缺席) General Performance (Attendance Record)									
期中考成績 Midterm Exam	30%	✓							
期末考成績 Final Exam									
作業成績 Homework and/or Assignments	40%		✓				✓		
其他 Miscellaneous (_____)	30%			✓	✓				

評量方式補充說明

Grading & Assessments Supplemental instructions

教科書與參考書目 (書名、作者、書局、代理商、說明)

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

References

Digital Image Processing 4th by Rafael C. Gonzalez and Richard E. Woods, Pearson. 開發書局(KAI FA Publishing) www.kaifabook.com.tw

Image Processing, Analysis, and Machine Vision 4th by Milan Sonka Václav Hlavác Roger Boyle, Cengage

課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址)

Teaching Aids & Teacher's Website(Including online teaching information.

Personal website can be listed here.)

Dong Hwa E-Learning Website

其他補充說明 (Supplemental instructions)