



課 綱 Course Outline

資訊工程學系人工智慧與創新應用碩士班

中文課程名稱 Course Name in Chinese	深度學習基石與實務				
英文課程名稱 Course Name in English	Foundation and Practice of Deep Learning				
科目代碼 Course Code	AIIA50140	班 別 Degree	碩士班 Master' s		
修別 Type	選修 Elective	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite					
課程目標 Course Objectives					
To teach students the theory and practical application ability related to deep learning technologies as the professional foundation for their future research and development in machine learning and artificial intelligence.					
系教育目標 Dept.' s Education Objectives					
1	探究學科知識，善用專業技能 Explore academic knowledge, utilize professional skills.				
2	訓練評析思考，創新解決問題 Exercise analytical thinking, enhance creative problem solving skills.				
3	學習團隊分工，強化溝通表達 Participate in teamwork, strengthen communication skills.				
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		
課程大綱 Course Outline		
1. 深度學習簡介 (Introduction to Deep Learning) 2. 淺層神經網路與逆傳學習演算法 (Shallow Neural Networks and Backpropagation Learning) 3. 深度學習框架程式開發 (Program Development Using Deep Learning Frameworks) 4. 卷積神經網路 (Convolutional Neural Networks) 5. 循環神經網路 (Recurrent Neural Networks) 6. 生成式對戰網路 (Generative Adversarial Networks) 7. 自編碼網路 (Autoencoder Networks) 8. 深度學習與電腦視覺應用案例探討 (Case Studies in Computer Vision Applications) 9. 深度學習與語言處理應用案例探討 (Case Studies in Language Processing Applications)		
資源需求評估 (師資專長之聘任、儀器設備的配合．．．等) Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)		
The course requires a PC with Tensorflow/PyTorch frameworks installed.		
課程要求和教學方式之建議 Course Requirements and Suggested Teaching Methods		
The classes are lectured by oral presentations with some online tutorial videos as supplementary materials. The evaluation will be done via at least three programming assignments or projects.		
其他 Miscellaneous		