

課

綱 Course Outline

理工學院學士班

中文課程名稱 Course Name in Chinese	深度學習					
英文課程名稱 Course Name in English	Deep Learning					
科目代碼 Course Code	TCA150040	班 別 Degree	學士班 Bachelor's			
修別 Type	學程 Program	學分數 Credit(s)	3.0	時數 Hour(s)	3.0	
先修課程 Prerequisite						
課程目標 Course Objectives						
 教師於課堂中引導式講授目前國際發展最先進之深度學習方法學及其應用,帶領學生原理介紹、數學推導實務應用,熟悉使用深度學習。 The instructor will guide students through the latest international developments in deep learning methodologies and applications. The course will cover theoretical principles, mathematical derivations, and practical applications. Students will gain hands-on experience with deep learning tools. (1)了解深度學習技術的數學基礎 (To understand the maths of deep learning techniques) (2)熟悉深度學習工具(例如 PyTorch、TensorFlow 等) (To familiarize with deep learning tools, such as PyTorch, TensorFlow, etc.) (3)探討深度學習技術的最新發展及其應用 (To understand the latest developments and applications of deep learning techniques) 						
College.'s Education Objectives						
1 培育專業知能,提升學習能力 Acquisition of professional competence and enhancement of learning abilities.						
院基本素養與核心能力 College Basic Learning Outcomes			課程目標 養與核心 Correlat between Objectiv Basic Lea Outcomes	ion Course es and arning		
具備數理基本知識、邏輯推理、分析解決問題之能力。 A Basic math knowledge, logical reasoning, analytical and problem -solving skills.						

具備中外語言表達溝通技巧,以養成團隊合作的能力。 B Ability to express ideas and communicate in Chinese and foreign languages and teamwork skills.					
C 具備終身學習的能力。 Lifelong learning ability.					
圖示說明Illustration :● 高度相關 Highly correlated ○中度相關 Moderately correlated					
課程大綱					
Course Outline					
Introduction & amp; Machine Learning Basics					
Linear Algebra					
Probability and Information Theory					
Numerical Computation					
Deep Networks?					
Deep Feedforward Networks					
Convolutional Networks					
Convolutional Networks					
Convolutional Networks & amp; Transformers					
Introduction to Reinforcement Learning					
Linear Factor Models					
Autoencoders					
Valued Based Reinforcement Learning					
Diffusion Models					
Normalizing Flows					
Policy-based Reinforcement Learning					
Offline RL					
Paper Presentation					
Final Exam					
Final Project Proposal					
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.)					
課程要求和教學方式之建議					
Course Requirements and Suggested Teaching Methods					
成績評量方式					
4 Labs (done individually) 80%					
Final exam 20%					
其他					
Miscellaneous					