

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	TCAI5004	班 別 Degree	碩士班 Master' s		
修別 Type		學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite					
課程目標 Course Objectives					
<p>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。</p> <p>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.</p> <p>(1)了解深度學習技術的數學基礎 (To understand the maths of deep learning techniques)</p> <p>(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.)</p> <p>(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)</p>					
課程大綱 Course Outline					

Introduction & Machine Learning Basics Linear Algebra Probability and Information Theory Numerical Computation Deep Networks Deep Feedforward Networks Convolutional Networks Convolutional Networks Convolutional Networks & 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
You must have access to GPU equipped with at least 6GB of memory