國立東華大學

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	機器學習				
英文課程名稱 Course Name in English	Machine Learning				
科目代碼 Course Code	AIIA50120	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

介紹機器學習的概念和常見傳統機器學習演算法，然後介紹資料分析處理，視覺化等步驟，同時也介紹類神經網路和深度學習，實作相關的套件包括scikit-learn tools和tensorflow等，以實作方式讓學生熟悉機器學習方法。
Introduce the concept of machine learning and common traditional machine learning algorithms, and then introduce the steps of data analysis and processing, visualization, etc., and also introduce neural network and deep learning. Implementation-related packages include scikit-learn tools and tensorflow, etc. The hands-on approach familiarizes students with machine learning methods.

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.Introduction, History and progress
2.Machine Learning Tools, Scikit-learn tools
3.Decision Tree and Random Forest
4.Regression
5.Support Vector Machine
6.K-Nearest Neighbor Algorithm
7.Bayesian Classifier
8.Data processing and visualization
9.Model Building
10.Unsupervised Learning
11.Neural Network
12.Deep Learning

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.)

師資專長：人工智慧、機器學習
儀器設備：電腦教室
Faculty expertise: Artificial Intelligence, Machine Learning
Equipment: Computer classroom

課程要求和教學方式之建議
Course Requirements and Suggested Teaching Methods

宜採理論與實務並重方式進行。
每一單元均應配合實作課程，以真正了解機器學習系統的實現。
It is advisable to adopt a balanced approach between theory and practice. Each unit should be accompanied by hands-on practice courses to truly understand the implementation of machine learning systems.

其他
Miscellaneous