



## 教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	機器學習		學年/學期 Academic Year/Semester		114/2			
課程名稱(英文) Course Name in English	Machine Learning							
科目代碼 Course Code	CSIEM0170	系級 Department & Year	碩士	開課單位 Course-Offering Department	資訊工程學系			
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)	3.0/3.0					
授課教師 Instructor	/顏士淨							
先修課程 Prerequisite								

## 課程描述 Course Description

This course introduces the concepts of machine learning and common traditional machine learning algorithms, followed by data analysis, processing, and visualization steps. It also covers neural networks and deep learning, and provides hands-on practice with tools such as WEKA, scikit-learn tools, and TensorFlow to familiarize students with machine learning methods. The course also includes project-based learning projects to help students understand how machine learning techniques are applied.

## 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 &amp; Content

週次 Week	內容 Subject/Topics	備註 Remarks
1	Introduction	
2	Machine Learning Concept	

3	Decision Tree & Random Forest	
4	Regression& Support Vector Machine	
5	KNN & Bayesian Classifier	
6	Ensemble learning & Time series analysis	
7	Unsupervised Learning	
8	MLP	
9	Exam.	
10	Data preprocess	
11	SKlearning tools	
12	SKlearning Supervised learning	
13	SKlearning Unpervised learning	
14	SKlearning MLP	
15	CNN	
16	Project oral report	
17	Exam.	
18		

#### 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 Industy-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:

\_\_\_\_\_

### 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
平時成績(含出缺席) General Performance (Attendance Record)	5%	✓	✓					
期中考成績 Midterm Exam	20%			✓			✓	
期末考成績 Final Exam	20%							
作業成績 Homework and/or Assignments	30%		✓				✓	
其他 Miscellaneous (專案)	25%				✓			

#### 評量方式補充說明

#### Grading & Assessments Supplemental instructions

70% of the assignment will be counted if submitted within one week. If submitted after one week, the remaining 50% can be submitted before the 15th week due to leave or other reasons.  
Other submissions will not be graded.

#### 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.)

TensorFlow + Keras深度學習人工智慧實務應用，林大貴著，博碩出版社。

Python 深度學習 (Python Deep Learning)

Valentino Zocca, Gianmario Spacagna, Daniel Slater, Peter Roelants 著、劉立民、吳建華、陳開輝 譯

Python 深度學習 (Python Deep Learning)

出版商:博碩文化

出版日期:2018-01-04

#### 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.)

#### 其他補充說明 (Supplemental instructions)