國立台灣科技大學 114學年 第2學期　課程大綱

Spring 2026 NTUST Course Outline

授課教師：邱建樺

Instructor:CHIU, CHIEN-HUA

課程名稱：機器學習與大數據分析技術

Course Title：Machine Learning and Big Data Analytics

2026/5/6

課程代號： MI5125701 Course Code 學分數： 3 Credits	必選修：選修/半學年 Required/Electve:Elective/Half Yr. 先修課程： Prerequisites
節次教室： W6(RB-510) W7(RB-510) W8(RB-510) Time/Location	
專業核心能力： 培養學生從事資料科學相關工作及研究所需之核心競爭力 Core Professional Competencies	
課程網址： Course Website	
課程宗旨： Course Objectives	This course provides a comprehensive introduction to machine learning and big data analytics, focusing on both theoretical foundations and practical implementations. Students will learn how to collect, preprocess, analyze, and model data using modern machine learning techniques. The course covers supervised and unsupervised learning algorithms, model evaluation, ensemble learning, hyperparameter tuning, and introductory deep learning concepts. Through hands-on exercises and real-world case studies, students will develop the ability to apply machine learning methods to solve practical data-driven problems in business, engineering, and information systems.
課程大綱： Outline of Lectures	1. Introduction to machine learning and predictive analytics 2. Python environment setup and programming fundamentals 3. Python libraries for data analysis and visualization 4. Exploratory data analysis (EDA) 5. Data preprocessing and feature engineering 6. Machine learning workflow and problem formulation 7. Linear regression and regression evaluation metrics 8. Supervised learning: classification algorithms 9. Classification model evaluation and performance metrics 10. Unsupervised learning: clustering techniques 11. Advanced machine learning algorithms (eg. SVM, KNN, polynomial regression) 12. Overfitting, regularization, and cross-validation 13. Ensemble learning methods (eg. Random Forest, XGBoost) 14. Hyperparameter tuning techniques 15. Neural networks and deep learning (eg. CNN, LSTM, Transformer) 16. Practical applications and case studies in machine learning
授課方式： Method of Instruction	講授 Lecture：60% 分組討論 Group discussion：10% 案例研討 Case study：20% 操做練習 Practical exercises：10% 講授 Lecture：%

教科書： Textbooks	
參考書目： References	
修課須知： Notice	
評量方式： Grading	Group Homework Assignments: 40%; Final Exam: 30%; Final Term Project: 20%; Class Participation: 10%
備註說明： Notes	