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：Loke Kar Seng, 楊朝龍

Instructor:Loke Kar Seng,Chao-Lung Yang

課程名稱：機器學習與大數據分析

Course Title：Machine Learning and Big Data Analytics

2026/11/3

課程代號： IM3124399 Course Code 學分數： 3 Credits	必選修：必修/半學年 Required/Electve:Required/Half Yr. 先修課程： Prerequisites
節次教室： Time/Location	W6(MA-215) W7(MA-215) W8(MA-215)
專業核心能力： Core Professional Competencies	□具備解決工程與管理問題之能力 □專業知識(Comprehensive management knowledge) □良好溝通表達之能力： □口說溝通能力(Oral communication skills); □書寫溝通能力(Written Communication Skills)
課程網址： Course Website	
課程宗旨： Course Objectives	本課程介紹大數據資料的特性及機器學習的方法及概念，並透過實作方式演練如何利用機器學習方法進行大數據資料分析，以學習如何轉換大數據資料至具有競爭價值之知識及決策。課程中以商業及工業4.0相關的資料介紹實務上的案例。 This course introduces the main characteristics of Big Data and the relevant applications. By offering the practicing exercises, students can learn how to analyze data by big data analytic tools such as R or Python tools and create valuable decisions. This course also introduces the case studies regarding business innovation and Industry 4.0.
課程大綱： Outline of Lectures	

	大數據資料指的是以極為快速（Velocity）的方式，急速累積具大容量（Volume）及多樣性（Variety）的資料。由於其資料特性，運用傳統的資料庫分析工具及方法將變得很困難，因此分析此類的資料需要特別的工具及方法。本課程將著重於利用機器學習(Machine Learning)方法找出隱藏於大數據資料中未知的特徵、相關性及其他有用的資訊，並轉化這些資訊為具競爭優勢的知識或決策。本課程將介紹大數據及其相關應用，並以實作方式演練機器學習的方法來進行資料分析，以提供同學對機器學習及大數據分析的了解。本課程將介紹下列課題： 1.大數據資料介紹 2.大數據資料架構 3.機器學習導論 4.機器學習於大數據資料應用 5.大數據相關案例 6.Hadoop系統簡介 7.MongoDB 系統簡介 8.Graph Database 簡介 9.Spark Machine Learning 簡介 Big Data is a collection of datasets that are accumulated in high Velocity with super large Volumes containing a Variety of data types. It is very difficult to process or analyze Big Data by using traditional database management tools or data processing applications. This course aims to apply Machine Learning on Big Data to uncover hidden patterns, unknown correlations and other useful information. Transforming Big Data to the valuable information or decision can provide competitive advantages and result in business benefits. This course will also introduce Machine Learning methods on Big Data and its application. Students will work on the hand-on project to learn how to use Machine Learning methods to analyze Big Data. This course will cover the following topics. 1.Introduction of Big Data 2.Big Data Structure 3.Introduction of Machine Learning 4.Apply Machine Learning on Big Data 5.Cast studies regarding business innovation 6.Introduction of Hadoop System 7.Introduction of MongoDB System 8.Introduction of Graph DB System 9.Spark Machine Learning Library
授課方式： Method of Instruction	講授 Lecture：70% 分組討論 Group discussion：0% 案例研討 Case study：0% 操做練習 Practical exercises：30% 講授 Lecture：%
教科書： Textbooks	Hands-On Machine Learning (HOML) with Scikit-Learn, Keras & Tensorflow. Aurelien Geron. Third Edition. 2022.
參考書目： References	1. Paul Deitel and Harvey Deitel, Intro to Python (ITP) for Computer Science and Data Science – Learning to Program with AI, Big Data and the Cloud, Global Edition, Pearson Education Limited 2. Wes McKinney, “Python for Data Analysis.”, ISBN: 978-1-449-31979-3, O’ REILLY
修課須知： Notice	
評量方式： Grading	Attendance (Individual) 10% Homework (Individual) 15% Mid-term exam (Individual) 25% Analytic Projects 1(Teamwork) 20% Final Project – report and presentation (Teamwork with EMBA students) 30% Total 100%

備註說明： Notes	Five or Six students should be formed as a team to work on projects. The topic of the project will be assigned by instructor. The objective of the term project is to help you develop your knowledge regarding Machine Learning program. The term project report and presentation are counted for the project grade. The project report should be written as a conference paper format (6-page limit). The presentation time of each project is 20 minutes.