

課程中文名稱 Title of Course in Chinese : 永續數據分析

課程英文名稱 Title of Course in English : Sustainability and ESG Data Analytics

應修系級 Major : 數位行銷進修學士學位學程4 ,

授課教師 Instructor : 戴敏育

選修類別 Required/Elective : 選

全半學年 Whole or Half of the Academic Year : 半學年

學 分 Credit(s) : 3 學分

時 數 Hour(s) : 3 小時

教師網址 Instructor's Website : <http://web.ntpu.edu.tw/~myday/>

教師專長 Instructor's Specialty : 電子商務 (Electronic Commerce), 金融科技 (Financial Technology), 人工智慧 (Artificial Intelligence), 大數據分析 (Big Data Analytics), 資料探勘與文字探勘 (Data Mining and Text Mining)

課綱附檔 Attachments :

先修科目 : 無

Prerequisites : None

教學目標 :

1. 瞭解永續數據分析基本概念。
2. 具備永續數據分析實務操作能力。
3. 整合大數據分析的創新思維，提升永續發展運作模式。
4. 在永續面向上，憑藉數據分析，研擬永續議題相關因應作為，並培養學生具有從資料中挖掘出具有管理意涵的數據分析基礎能力

Course Objectives :

1. Understand the fundamental concepts of sustainability and ESG data analytics.
2. Equip with Hands-on practices of sustainability and ESG data analytics.
3. Integrate innovative thinking of big data analysis to enhance the operational model of sustainable development.
4. In the context of sustainability, use data analysis to formulate responses to sustainable issues and cultivate students' ability to extract management-relevant data analysis skills from the data.

本課程包含永續發展(SDGs)目標(→[點此瞭解永續相關目標](#)←) :

- SDG4 | 優質教育 (Quality Education)
- SDG7 | 可負擔的潔淨能源 (Affordable and Clean Energy)
- SDG8 | 尊嚴就業與經濟發展 (Decent Work and Economic Growth)
- SDG9 | 產業創新與基礎設施 (Industry, Innovation and Infrastructure)
- SDG11 | 永續城市與社區 (Sustainable Cities and Communities)
- SDG12 | 負責任的消費與生產 (Responsible Consumption and Production)
- SDG13 | 氣候行動 (Climate Action)
- SDG17 | 夥伴關係 (Partnerships for the Goals)

內容綱要 :

本課程介紹永續數據分析基本概念與實務操作。課程內容包括 永續數據分析概論、環境、社會與治理 (ESG) 淨零數位轉型、永續與ESG 資料科學、Web 3.0 和大數據分析在金融科技、綠色永續金融、TCFD 氣候相關財務揭露與En-ROADS 氣候變遷模擬、ESG數據的收集、分析和視覺化、ESG數據報告、企業永續報告書、ESG數據驗證、能源之星報告與數據揭露、人工智慧物聯網在ESG永續應用、生成性AI於永續評等和報告生成、與永續數據分析個案研究。

課程與教學特色 :

1. 結合 Web3.0介紹大數據分析基本概念、研究議題與實務操作。
2. 提供數據整合溝通企劃的理論與實務概念及工具。
3. 應用於分析各領域的資料，並透過資料視覺化的方式呈現分析結果。

預期社會影響 :

1. 由數據分析學習，培養面對永續議題與風險時，因應作為分析能力。
2. 培養具備大數據分析基本概念、研究議題、實務操作以及永續數據分析實作能力的人才。

Course Outline :

This course introduces the fundamental concepts and hands-on practices of Sustainability and ESG Data Analytics. Topics include Introduction Sustainability and ESG Data Analytics, Environmental, Social, and Governance (ESG) in Net-Zero Digital Transformation, Data Science for Sustainability and ESG, Web 3.0 and Big Data Analysis in Fintech, Green Finance, Sustainable Finance, Task Force on Climate-Related Financial Disclosures (TCFD) and En-Roads Interactive, ESG Data Gathering, Analysis, and Visualization, ESG Data Reporting, Corporate Sustainability Reports, ESG Data Verification, Energy Star Reporting and Data Disclosure, Artificial Intelligence of things (AIoT) in ESG and Sustainability Applications, Generative AI for ESG Rating and Reporting Generation, and Case Study on Sustainability and ESG Data Analytics.

Course and Teaching Features:

1. Combine Web3.0 to introduce basic concepts of big data analysis, research topics, and practical operations.
2. Provide theories and tools for data integration and communication planning.
3. Apply to analyze data from various domains and present analysis results through data visualization.

Expected Social Impact:

1. Learn from data analysis, cultivating the ability to analyze responses when facing sustainable issues and risks.
2. Train talents who possess basic concepts of big data analysis, research topics, practical operations, and practical abilities in sustainable data analysis.

學生核心能力關連(Student's Core Competence) :
(八大核心能力為百分比；合計100%；Total 100%)

(進修)數位行銷進修學士學位學程 112年 系核心能力：
具有判斷商業問題並有系統地解決這些問題 40 %
能展現商業教育所需的基本技能 40 %
具有溝通能力 10 %
能意識道德問題及其影響 5 %
透過參與相關活動了解國際議題 5 %

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校四大基本素養 Four Fundamental Qualities							
專業 Professionalism		人際 Interpersonal Relationship		倫理 Ethics		國際觀 International Vision	
創意思考 與問題解 決 (Creative thinking and Problem- solving) 40 %	綜合統整 (Comprehensive Integration) 40 %	溝通協調 (Communication and Coordination) 10 %	團隊合作 (Teamwork) 5 %	誠信正直 (Honesty and Integrity) 0 %	尊重自省 (Self- Esteem and Self- reflection) 0 %	多元關懷 (Caring for Diversity) 0 %	跨界宏觀 (Interdisciplinary Vision) 5 %

商學院學習目標(College Learning Goals) :

Communication
Analytical and Critical Thinking
Ethics/Corporate Social Responsibility
Global Knowledge/Awareness

系所學習目標(Department Learning Goals) :

教學進度(Teaching Contents) :

週別 (Weekly Schedule)	日期 (Date)	教學預定進度 (Tentative teaching schedule) (若有調整，依教師實際授課為準; Adjustments are made according to instructor's actual teaching schedule)	教學方法與教學活動 (Teaching methods and activities)
Week 1	20240223	永續數據分析概論 (Introduction Sustainability and ESG Data Analytics)	講授Lecture 討論Discussion
Week 2	20240301	環境、社會與治理 (ESG) 淨零數位轉型 (Environmental, Social, and Governance (ESG) in Net-Zero Digital Transformation)	講授Lecture 討論Discussion 實習Practicum
Week 3	20240308	永續與ESG 資料科學 (Data Science for Sustainability and ESG)	講授Lecture 討論Discussion 實習Practicum
Week 4	20240315	永續數據分析個案研究 I (Case Study on Sustainability and ESG Data Analytics I)	討論Discussion
Week 5	20240322	Web 3.0 和大數據分析在金融科技、綠色永續金融 (Web 3.0 and Big Data Analysis in Fintech, Green and Sustainable Finance)	講授Lecture 討論Discussion 實習Practicum
Week 6	20240329	TCFD 氣候相關財務揭露與En-ROADS 氣候變遷模擬(Task Force on Climate-Related Financial Disclosures (TCFD) and En-Roads Interactive)	講授Lecture 討論Discussion 實習Practicum
Week 7	20240405	放假一天 (No Classes)	其他Others
Week 8	20240412	期中報告 (Midterm Project Report)	討論Discussion
Week 9	20240419	ESG數據的收集、分析和視覺化 (ESG Data Gathering, Analysis, and Visualization)	講授Lecture 討論Discussion 實習Practicum
Week 10	20240426	ESG數據報告 (ESG Data Reporting); 企業永續報告書 (Corporate Sustainability Reports)	講授Lecture 討論Discussion 實習Practicum
Week 11	20240503	ESG數據驗證 (ESG Data Verification)	講授Lecture 討論Discussion 實習Practicum
Week 12	20240510	永續數據分析個案研究 II (Case Study on Sustainability and ESG Data Analytics II)	討論Discussion
Week 13	20240517	能源之星報告與數據揭露 (Energy Star Reporting and Data Disclosure)	講授Lecture 討論Discussion 實習Practicum
Week 14	20240524	人工智慧物聯網在ESG永續應用 (Artificial Intelligence of things (AIoT) in ESG and Sustainability Applications)	講授Lecture 討論Discussion 實習Practicum
Week 15	20240531	生成性AI於永續評等和報告生成 (Generative AI for ESG Rating and Reporting Generation)	講授Lecture 討論Discussion 實習Practicum
Week 16	20240607	期末報告 (Final Project Report)	討論Discussion
Week 17&18 : 彈性補充教學		學生自主學習 (Self-learning)	

評量方式(Evaluation Methods) :

課堂之前測(Pre-test) 0 %

課堂之隨堂測驗(Quiz) 0 %

期中考-筆試(Mid-Term Exam) 0 %

期末考-筆試(Final Exam) 0 %

個案分析報告(Case Report) 20 %

課堂參與(Class Participation) 10 %

個人報告(Individual Presentation) 30 %

團體報告(Group Presentation) 30 %

作業(Assignment) 10 %

其他評量方式(Other Evaluation Methods)

指定用書(Required Texts) :

Cino Robin Castelli, Cyril Shmatov (2022), Quantitative Methods for ESG Finance, Wiley

參考書目(Reference Books) :

1. Simon Thompson (2023), Green and Sustainable Finance: Principles and Practice in Banking, Investment and Insurance, 2nd Edition, Kogan Page.
2. Chrissa Pagitsas (2023), Chief Sustainability Officers At Work: How CSOs Build Successful Sustainability and ESG Strategies, Apress.
3. Hariom Tatsat, Sahil Puri, Brad Lookabaugh (2020), Machine Learning and Data Science Blueprints for Finance: From Building Trading Strategies to Robo-Advisors Using Python, O'Reilly Media
4. Aurélien Géron (2022), Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems, 3rd Edition, O'Reilly Media.
5. Chris Kelliher (2022), Quantitative Finance With Python: A Practical Guide to Investment Management, Trading, and Financial Engineering, Chapman and Hall/CRC.
6. Yves Hilpisch (2020), Artificial Intelligence in Finance: A Python-Based Guide, O'Reilly Media.
7. Abdullah Karasan (2021), Machine Learning for Financial Risk Management with Python: Algorithms for Modeling Risk, O'Reilly Media.
8. Yves Hilpisch (2018), Python for Finance: Mastering Data-Driven Finance, 2nd Edition, O'Reilly Media.

其他參考資料(Other References) :

1. GRI (Global Report Initiative): <https://www.globalreporting.org/>
2. CDP (Carbon Disclosure Project): <https://www.cdp.net/>
3. SASB (Sustainability Accounting Standards Board): <https://sasb.org/>
4. ISSB (International Sustainability Standards Board): <https://www.ifrs.org/groups/international-sustainability-standards-board/>
5. TCFD (Task Force on Climate-related Financial Disclosures): <https://www.fsb-tcfd.org/>
6. Research Papers

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