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國立高雄科技大學
NATIONAL KAOHSIUNG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY
授課大綱 Syllabus

部別：日間部博士

112學年度第2學期

列印日期：2024/03/01

中文課程名稱：有害廢棄物管理	英文課程名稱：Hazardous Waste Management	授課教師：阮青平
開課班級：水產科技博班一甲	學分：3.0	授課時數：3.0
合班班級：		實習時數：0.0

1. 中文教學目標(Chinese Teaching objectives)
本課程將透過環境工程與管理的觀點，鼓勵學生課堂參與，啟發學生思考能力，提昇學生學習意願，引領學生進入有害廢棄物管理的領域。

2. 英文教學目標(English Teaching objectives)
Hazardous waste management provides the basic concepts of environmental engineering and management for planning and management of hazardous waste. It provides integrated tools in explaining complex solid and hazardous wastes problems of environmental importance. Overall, this course provides a condensed and integrated tool for student learning and covers key concepts in the rapidly developing field of prevent, minimize, recycle, dispose, and treat waste.

3. 中文教學綱要(Chinese CourseDescription)
有害廢棄物管理課程主要目的有二：(1)探討環境工程實務上特別重要的廢棄物處理與管理概念；(2)建立有害廢棄物減量與資源化的基本概念，以作為學生未來在研究及實務工作上的基礎。

4. 英文教學綱要(English CourseDescription)
The hazardous waste management divided into two-fold approach of (1) focusing on the aspects of management, planning, legal and engineering of hazardous waste treatment and disposal, and (2) laying the groundwork for understanding the most common techniques to prevent, minimize, recycle, dispose and treat waste and future trends in waste management.

5. 中文核心能力		
	核心能力名稱	核心能力百分比
1	生物資源永續	25%
2	產銷管理能力	25%
3	整合與研究能力	25%
4	創新溝通能力	25%

6. 英文核心能力		
	核心能力名稱	核心能力百分比
1	Biological resource sustainability	25%
2	Production and sales management capabilities	25%
3	Integration and research skills	25%
4	Innovative communication skills	25%

7. 教科書

中文書名：有害廢棄物管理 英文書名：Hazardous Waste Management

中文作者：Michael D Lagrega, Phillip L. Buckingham, Jeffrey C. Evans 英文作者：Michael D Lagrega, Phillip L. Buckingham, Jeffrey C. Evans

1 中文出版社：麥格勞·希爾 英文出版社：McGraw-Hill College

出版日期：年 月 備註：

8. 參考書

中文書名：整合性固體廢物管理：工程原理和管理問題 英文書名：Integrated Solid Waste Management: Engineering Principles and Management Issues

1 中文作者：George Tchobanoglous, Hilary Theisen, Samuel A. Vigil 英文作者：George Tchobanoglous, Hilary Theisen, Samuel A. Vigil

中文出版社：麥格勞·希爾 英文出版社：McGraw-Hill College

出版日期：年 月 備註：

9. 教學進度表

週次或項目 Week or Items	中文授課內容 Chinese Course Content	英文授課內容 English Course Content	分配節次 Assigned Classes	備註 Note
1. 有害廢棄物管理的演進 Evolution of Hazardous Waste Management	介紹基本定義、歷史根源、具有里程碑意義的事件、監管措施、分類、生成、污染場址、未來的努力方向、環境倫理	Working Definition, Historical Roots, Landmark Episodes, Regulatory Initiatives, Classification, Generation, Contaminated Sites, Future Endeavors, Environmental Ethic	3	
2. 法律框架 The Legal Framework	環境法、資源保護和回收法法案、RCRA 下的聯邦危險廢棄物條例	Environmental Law, Resource Conservation and Recovery Act, Federal Hazardous Waste Regulations under RCRA	3	
3. 程序原理 Process Fundamentals	物理化學性質、能量和質量平衡、反應和反應器、地球化學建模和分析程序	Physical-Chemical Properties, Energy and Mass Balances, Reactions and Reactors, Geochemical Modeling and Analysis Programs	3	
4. 污染物的宿命與傳輸 Fate and Transport of Contaminants	污染物釋放、地下污染物的輸送、地下污染物的宿命、大氣輸送和污染物擴散	Contaminant Release, Transport of Contaminants in the Subsurface, Fate of Contaminants in the Subsurface, Atmospheric Transport and Dispersion of Contaminants	3	
5. 毒理學 Toxicology	暴露、毒性作用、劑量效應關係、非致癌物、致癌物、生態毒理學	Exposure, Toxic Effects, Dose-Response Relationships, Noncarcinogens, Carcinogens, Ecotoxicology	3	

6.環境審核 Environmental Audits	專案規劃、審核前準備、現場審核、評估和演示	Program Planning, Preaudit Preparation, On-Site Audit, Evaluation and Presentation	3
7.污染預防 Pollution Prevention	一般注意事項、管理策略、生命週期分析、減量、減毒、回收	General Considerations, Management Strategies, Life Cycle Analysis, Volume Reduction, Toxicity Reduction, Recycling	3
8.設施開發和運營 Facility Development and Operations	設施類型、設施運營、需求評估、選址、公眾參與、許可	Facility Types, Facility Operations, Needs Assessment, Site Selection, Public Participation, Permitting	3
9.物化處理程序 Physico-Chemical Processes	氣提、碳吸附、化學氧化、超臨界流體、薄膜程序	Air Stripping, Carbon Adsorption, Chemical Oxidation, Supercritical Fluids, Membrane Processes	3
10.生物轉化技術 Biological Methods	微生物代謝原理、外源生物降解、生長動力學、現地生物處理系統	Basics of Microbial Metabolism, Biodegradation of Xenobiotics, Growth Kinetics, In-situ Biological Treatment Systems	3
11.穩定化和固化 Stabilization and Solidification	機制、技術、測試、現場實施、設計、案例研究	Mechanisms, Technology, Testing, Field Implementation, Design, Case Studies	3
12.熱轉換處理技術 Thermal Methods	燃燒、氣體和蒸氣、液體噴射焚化爐、固體廢物焚化、儲存和進料系統、空氣污染控制	Combustion, Gases and Vapors, Liquid Injection Incinerators, Solid Waste Incineration, Storage and Feed Systems, Air Pollution Control	3
13.掩埋處置 Land Disposal	垃圾掩埋場運營、選址、襯墊和滲濾液收集系統、通過垃圾掩埋場屏障的污染物輸送、垃圾填埋場穩定性、地表蓄水和深井注入/關閉和關閉後維護	Landfill Operations, Site Selection, Liner and Leachate Collection Systems, Contaminant Transport through Landfill Barriers, Landfill Stability, Surface Impoundments and Deep Well Injection, Closure and Postclosure Care	3
14.定量風險評估 Quantitative Risk Assessment	風險、危害識別、暴露評估、毒性評估、風險特徵、風險溝通、生態風險評估、案例研究	Risk, Hazard Identification, Exposure Assessment, Toxicity Assessment, Risk Characterization,	3

		Risk Communication, Ecological Risk Assessment, Monte Carlo Methods, Case Study	
15. 場址設施規劃 Site and Subsurface Characterization	方法論、規劃、場地特徵描述方法、地球物理方法、鑽孔和取樣、監測井、案例研究	Methodology, Planning, Methods of Site Characterization, Geophysical Methods, Boring and Sampling, Monitoring Wells, Case Study	3
16. 復育方案 Containment	復育目標、被動污染物控制系統、地表水控制技術、地下水控制、復育系統、土壤蒸汽提取、可滲透反應處理牆	Remedial Objectives, Passive Contaminant Control Systems, Surface Water Control Technologies, Groundwater Control, Remediation Systems, Soil Vapor Extraction, Permeable Reactive Treatment Walls	3
17. 復育方案分析 Remedial Alternatives Analysis	概述或復育措施選擇過程、案例研究	Overview or Remedy Selection Process, Case Study	3
18. 固體廢物管理的最新進展 Recent advances in solid waste management	循環經濟和固體廢物管理經濟學	The circular economy and the economics of solid waste management	3
10. 中文成績評定(Chinese Evaluation method)			
期中考成績：30%，期末考成績：40%，作業報告：30%			
11. 英文成績評定(English Evaluation method)			
Midterm exam scores: 30%, Final exam scores: 40%, Reporting scores: 30%			
12. 中文課堂要求(Chinese Classroom requirements)			
無			
13. 英文課堂要求(English Classroom requirements)			
none			
14. 本課程與SDGs相關項目(This course is relevant to these of SDGs as following)			
6. 潔淨水與衛生(Clean Water and Sanitation); 14. 水下生命(Life Below Water);			

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