國立東華大學

課　　綱　Course Outline

自然資源與環境學系碩士班國際組

中文課程名稱 Course Name in Chinese	循環經濟				
英文課程名稱 Course Name in English	Circular economy				
科目代碼 Course Code	NRESM0590	班 別 Degree	碩士班 Master’s		
修別 Type	選修 Elective	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite					

課程目標
Course Objectives

1.Foundations of Circular Economy: Provide students with a comprehensive understanding of CE principles, differentiating them from linear economic models, and emphasizing resource efficiency, product life extension, and closed-loop systems.
2.Frameworks and Standards: Introduce international CE standards and guidelines, including BS 8001 and relevant ISO standards (e.g., ISO 14067 for product carbon footprint, ISO 14064 for GHG accounting), to equip students with methodological tools for assessment and implementation.
3.Circular Strategies and Business Models: Enable students to analyze and design strategies such as industrial symbiosis, eco-design, reverse logistics, waste-to-resource innovations, and product-service systems that enhance sustainability and competitiveness.
4.Sector-Specific Applications: Examine real-world CE applications across manufacturing, agriculture, construction, and service industries, emphasizing how circularity integrates with low-carbon and net-zero transitions.
5.Problem-Solving and Project Development: Develop students’ ability to apply CE concepts in practical projects, fostering innovation in waste reduction, renewable resource use, and sustainable value-chain management.

系教育目標
Dept.’s Education Objectives

1	培養兼具國際視野與本土關懷的學生 To develop students who care about local issues and have an international perspective.
2	培養具備自然科學與社會科學知識的人才 To educate students to have knowledge of both the natural and social sciences.
3	培養具備環境倫理與人文素養的環境公民 To teach students to be environmental citizens (i.e., knowledgeable about environmental ethics and human issues.).

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	能覺知多元的自然科學與社會科學理論並具備研究能力 To have knowledge of natural and social science theories.	
B	具備自然資源與人類社會議題之調查分析、規劃與經營之能力 To be able to investigate, analyze, plan, and manage both natural resource and human social issues.	
C	具備將環境倫理與生態思想落實於永續性生活型態的能力 To implement sustainable lifestyles based on environmental ethics and ecological principles.	
D	能以整全式的觀點來解析環境問題，並具備發展系統性解決方案的能力 To resolve environmental issues and develop systematic solutions with a global perspective.	
E	具備系統分析、未來思考、溝通協調與團隊合作的能 The ability to analyze, plan, communicate, and coordinate with others (teamwork)	
F	具備終身學習、國際視野與外語溝通的能力 To instill the values of lifelong learning, an international perspective, and the ability to communicate in a foreign language.	

圖示說明Illustration ：● 高度相關 Highly correlated ○中度相關 Moderately correlated

課程大綱
Course Outline

This course introduces graduate students to the principles, frameworks, and practical applications of the circular economy (CE). Students will learn how CE differs from the traditional linear economy, focusing on strategies to minimize resource consumption, extend product life cycles, and regenerate natural systems. The course highlights international standards, policies, and industry practices that guide circular transformation, including BS 8001 Circular Economy Principles and ISO standards relevant to sustainable product design and carbon footprinting. Through case studies from manufacturing, agriculture, and service industries, students will analyze how circular strategies—such as product-service systems, industrial symbiosis, waste valorization, and material circularity—contribute to sustainability and net-zero transitions. Practical components will include project-based assignments where students design circular solutions for real-world challenges.

資源需求評估（師資專長之聘任、儀器設備的配合・・・等）
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

課程要求和教學方式之建議
Course Requirements and Suggested Teaching Methods

課堂講授
分組討論
參觀實習

其他
Miscellaneous

Participation: 20%　Seminar Presentation: 30% Final Report: 30%　Homework and/or Assignments: 20%