

Course Information						
Year	AY 2025-2026		School	UNU-IAS		
Course Title	Education for Sustainable Development					
Instructor Contact Information	khajuria@unu.edu					
Term/Day/Period	AY 2025 Autumn / From 02/10/2025 to 29/01/2026					
Category (Choose from the List)	Elective		Eligible Year	Year 1 and above	Credits	2
Classroom	Lecture room, 6th floor in the UNU building		Campus	UNU-HQ, Tokyo, Japan		
Main Language	English					
Class Modality Categories	On-Campus					
Course Code	622190					
Level	Graduate-level		Types of lesson (Choose from the List)	Lecture		

Syllabus Information	
Subtitle	From Global Agendas to Local Actions with Circular Economy
Course Description (Word limit: 200)	<p>The circular economy (CE) is increasingly central to Education for Sustainable Development (ESD), offering a transformative approach to minimizing waste and maximizing resource efficiency. By integrating CE principles-reduce, reuse, and recycle into ESD, this course empowers students to understand and address the interconnected economic, social, and environmental dimensions of sustainability. The course covers the fundamental concepts of ESD and the importance of the circular economy in achieving the Sustainable Development Goals (SDGs). It also emphasizes innovative methodologies, community-driven development, and real-world applications of CE in both global and local contexts.</p> <p>The course includes engaging lectures, interactive activities and thought-provoking documentaries. Students will: (a) analyze the relationship between international sustainability agendas and local community actions; (b) investigate sustainability challenges in local communities and explore solutions rooted in CE and ESD; (c) study innovative CE approaches, policies, and ESD programmes, with a focus on the roles of teachers, youth, and community stakeholders through case studies. By the end of the course, students will have a robust understanding of the importance of education in advancing the CE and ESD. (176 words)</p>
Objectives and Learning Goals (Bullet points)	<ol style="list-style-type: none"> 1. Understand the principles and concepts of CE and ESD in achieving SDGs. 2. Evaluate critically the impact of global and local actions in advancing CE and sustainable development. 3. Learn foundational theories and real-world practices of CE and the importance of the local context in shaping education strategies for sustainability, focusing on translating global sustainability goals into actionable initiatives at the community level. 4. Foster critical thinking and problem-solving skills to address challenges associated with transitioning to a CE and achieving sustainable development.

<p>Requirements</p> <p><i>This part should include the expected working hours.</i></p>	<p>Individual Assignment (Individual presentation)</p> <ul style="list-style-type: none"> Purpose: This assignment aims to help students identify, analyze and understand the significance of ESD in achieving SDGs within your thematic research area (e.g. water, biodiversity, energy, waste). 1. Topic selection: Select a current and a local sustainable issue within your research area (e.g. plastic waste in rivers, biodiversity loss in local forests). 2. Evaluate how education can contribute to resolving this challenge. 3. Identify target learners (e.g. policymakers, community, and many more) need to be engaged in your programme. 4. Clearly link your issue to SDG 4 and at least one other relevant SDG (for example, SDG 6 for waste). 5. Design a programme by using principles of AOP or incorporate principles from GEP. 6. Impact of your programme, discuss how to assess the effectiveness and impact of your programme on individuals and communities, using SDG indicators your programme can contribute to. <p>Format: This assignment consists of an individual presentation. Prepare a 10-min presentation with clarity and confidence plus 5 minutes for Q&A. Engage your classmates with questions, examples, and references.</p> <p>Final Assignment (Group presentation and Group report)</p> <ul style="list-style-type: none"> Purpose: The goal of this assignment is to synthesis the course knowledge by critically analyzing how ESD and CE intersect to address sustainability challenges in a specific country or region. You will apply course knowledge to real-world contexts, evaluate current practices, and develop actionable recommendations that align with the SDGs. <p>The requirements include:</p> <ol style="list-style-type: none"> 1. Introduction: Provide an overview of the selected county/region and specific sustainability challenge you will address. 2. Context and challenge analysis: Analyze the local context, key issues related to the sustainability challenge. 3. Case study: Current practices and policies: Evaluate the current practices and policies related to ESD and CE in the chosen area 4. Integrative framework and educational strategies: Propose how CE and ESD can be integrated, utilizing AOP pedagogies. 5. Policy recommendation and alignment with SDGs: Present evidence-based recommendations for advancing ESD and CE that align with the SDGs. 6. Conclusion: Summary of findings and discuss the implications for practice. 7. References <p>Format: This assignment consists of a group presentation and a group report.</p> <ul style="list-style-type: none"> Group presentation: The group will have 20 minutes to present the final assignment, followed by 5 minutes for questions and answers. Students should use PowerPoint or a similar presentation platform. Each student should actively participate in the delivery of the presentation. Interactive involvement from the other group is encouraged to ask questions. Group report: Should be no more than 4,000 words, excluding references. Quality visualizations, such as charts and graphs, are strongly encouraged. The document must be formatted on A4 size paper, in MS format, and single-spaced, with 12-point Times New Roman font. For in-text citations and the bibliography, students should use either APA or Harvard style citations. 				
<p>Course Outline</p> <p><i>Detailed information could be provided on Moodle such as the information of the lecturers, etc.</i></p>	Lecture no.	Frame-work	Title	Date (tentative)	Instructors/Invited Speakers if any
	1	Sustainable Education for	Introduction to Sustainable Development: <ul style="list-style-type: none"> Learning goals Course overview SDG indicators 	Thursday, 2 October 2025, ~ 09:30-11:10	Anupam Khajuria (UNU IAS)

	2		Introduction of ESD and SDGs: <ul style="list-style-type: none"> • ESD: Theory and Practices • SDG 4: Education 2030 Agenda • Introduction of Action-oriented pedagogies (AOP) 	Thursday, 9 October 2025, ~ 09:30-11:10	Anupam Khajuria (UNU IAS)
	3		Introduction of ESD: <ul style="list-style-type: none"> • Trends, main issues and challenges • ESD 2030 Roadmap: Five priority areas • Introduction of Greening Education Partnership (GEP) 	Thursday, 16 October 2025, ~ 09:30-11:10	Anupam Khajuria (UNU IAS)
	4		Innovative ESD programmes <ul style="list-style-type: none"> • Cases (policies, learning environment, teachers, youth and community involvement) 	Thursday, 23 October 2025, ~ 09:30-11:10	Fred Emmanuel Sato (UNU-IAS)
	5		Technologies in education: <ul style="list-style-type: none"> • Pros and cons • Inclusive design of technology 	Thursday, 30 October 2025, ~ 09:30-11:10	João Filipe Papel (UNU-IAS)
	6,7	Understanding of Circular Economy Principles and Practices	Individual presentation (30 mins) Introduction to Circular Economy (CE) <ul style="list-style-type: none"> • Historical development of CE: From linear to circular models • Core CE theories: Cradle-to-Cradle, Industrial economy • Principles and practices of CE • Opportunities and challenges of CE <i>(by 4 November 2025: Deadline to submit individual assignment)</i>	Thursday, 6 November 2025, ~ 09:30-13:00	Anupam Khajuria (UNU IAS)
	8		Circular economy: Case of electronic waste <ul style="list-style-type: none"> • How ESD can be used to address specific CE issues 	Thursday, 13 November 2025, ~ 09:30-11:10	Prof. Sunil Herat, Griffith University, Australia (Online)
	9		Circular economy: Case of biomass waste <ul style="list-style-type: none"> • How ESD can be used to address specific CE issues 	Thursday, 20 November 2025, ~ 09:30-11:10	Prof. P. Agamutu, Sunway University, Malaysia (Online)
	10		Circular economy: Case of renewable energy <ul style="list-style-type: none"> • How ESD can be used to address specific CE issues 	Thursday, 27 November 2025, ~ 09:30-11:10	Prof. Prasad Kaparaju, Griffith University, Australia (Online)
	11		Circular economy: Case of plastic waste <ul style="list-style-type: none"> • How ESD can be used to address specific CE issues 	Thursday, 4 December 2025, ~ 09:30-11:10	Anupam Khajuria (UNU-IAS)

	12	ES D and CE	Lecture and Documentary: <ul style="list-style-type: none"> Education for Sustainable Future – Inspiring Practices from Europe (link) Circular design for food: six short stories (link) 	Thursday, 11 December 2025, ~ 09:30-11:10	Anupam Khajuria (UNU IAS)
	13		Case studies from RCE on CE: <ul style="list-style-type: none"> Rethinking waste and value Community-based projects 	Thursday, 18 December 2025, ~09:30-11:10	Anupam Khajuria (UNU IAS)
	14		Case studies from RCE on Inclusive education <ul style="list-style-type: none"> Indigenous communities 	Thursday, 22 January 2026, ~ 09:30-11:10	Giselle Miole (UNU IAS)
	15		Final Presentation (27 January 2026: Deadline to submit final presentation) and (30 January 2026: Deadline to submit short written assignment)	Thursday, 29 January 2026, ~ 09:30-11:10	Anupam Khajuria (UNU IAS)
Course Readings	Lecture No.	Recommended Readings			
	1	Introduction of ESD <ul style="list-style-type: none"> Transforming our world: the 2030 Agenda for Sustainable Development https://sdgs.un.org/2030agenda Tier classification for SDG indicators https://unstats.un.org/sdgs/files/Tier%20Classification%20of%20SDG%20Indicators%2010%20Apr%202025_web.pdf 			
	2	Importance of ESD <ul style="list-style-type: none"> Unpacking Sustainable Development Goal 4: Education 2030: https://unesdoc.unesco.org/ark:/48223/pf0000246300.locale=en Chien SC, Knoble C. Research of Education for Sustainable Development: Understanding New Emerging Trends and Issues after SDG 4. J Sustain Res. 2024;6(1):e240006. https://doi.org/10.20900/jsr20240006 Eric. 2005. Why quality matters in education. https://www.researchgate.net/publication/252555388_Why_Quality_Matters_in_Education Action-oriented pedagogies publication (RCE publication) [to be published and available online] 			
	3	Introduction of ESD <ul style="list-style-type: none"> Education for sustainable development: a roadmap https://unesdoc.unesco.org/ark:/48223/pf0000374802 Chapter 1 'From Agenda 21 to Target 4.7: the development of ESD' from report: Issues and trends in education for sustainable development. https://sdghelpdesk.unescap.org/sites/default/files/2018-11/261445e.pdf Bylund, L., Hellberg, S., & Knutsson, B. (2021). 'We must urgently learn to live differently': the biopolitics of ESD for 2030. Environmental Education Research, 28(1), 40–55. https://doi.org/10.1080/13504622.2021.2002821 Greening Education Partnership, Chapter 1 and 2: https://unesdoc.unesco.org/ark:/48223/pf0000390028 			

	4	ESD and innovative programmes
	5	Technologies in education
	6,7	Circular Economy
		<ul style="list-style-type: none"> • Video basics of a CE https://www.ellenmacarthurfoundation.org/videos/basics-of-a-circular-economy • Anupam Khajuria, Vella A. Atienza, Suchana Chavanich, Wilts Henning, Ishrat Islam, Ulrich Kral, Meng Liu, Xiao Liu, Indu K. Murthy, Temitope D. Timothy Oyedotun, Prabhat Verma, Guochang Xu, Xianlai Zeng, Jinhui Li, Accelerating circular economy solutions to achieve the 2030 agenda for sustainable development goals, Circular Economy, Volume 1, Issue 1, 2022, 100001, ISSN 2773-1677, https://doi.org/10.1016/j.cec.2022.100001 • Julian Kirchherr, Laura Piscicelli, Towards an Education for the Circular Economy (ECE): Five Teaching Principles and a Case Study, Resources, Conservation and Recycling, Volume 150, 2019, 104406, ISSN 0921-3449, https://doi.org/10.1016/j.resconrec.2019.104406 • Ellen MacArthur Foundation report. Designing out waste and driving a circular economy on a university campus. https://content.ellenmacarthurfoundation.org/m/2772a3188e543f55/original/Designing-out-waste-and-driving-a-circular-economy-on-a-university-campus-MIT-case-study.pdf • Yuliya Kalmykova, Madumita Sadagopan, Leonardo Rosado, Circular economy – From review of theories and practices to development of implementation tools, Resources, Conservation and Recycling, Volume 135, 2018, Pages 190-201, ISSN 0921-3449, https://doi.org/10.1016/j.resconrec.2017.10.034 • Purushothaman, R., Alamelu, R., Selvabaskar, S. et al. Theories, techniques and strategies of sustainable circular economy: a systematic literature review. Discov Sustain 6, 297 (2025). https://doi.org/10.1007/s43621-025-01161-5
	8	Circular Economy: Electronic waste
		<ul style="list-style-type: none"> • E-Waste Management in Asia Pacific Region: Review of Issues, Challenges and Solutions: https://neptjournal.com/upload-images/(5)D-1148.pdf • The United Nations and E-waste: https://unemg.org/images/emgdocs/ewaste/E-waste%20Synthesis%20Report%20-%20unedited%20version.pdf
	9	Circular Economy: Biomass waste
		<ul style="list-style-type: none"> • Hsiao, C.-J., & Hu, J.-L. (2024). Biomass and Circular Economy: Now and the Future. Biomass, 4(3), 720-739. https://doi.org/10.3390/biomass4030040 • Helander H, Beck-O'Brien M, Lutz C, Schaldach R, Schomberg A, Többen J and Bringezu S (2025) Six footprints to monitor the bioeconomy into a safe and just future. Front. Environ. Sci. 13:1563666. doi: 10.3389/fenvs.2025.1563666

		<ul style="list-style-type: none"> Kusch-Brandt S, Heaven S. Biological wastes and the circular economy: Not yet where we could be. Waste Management & Research. 2025;43(3):293-296. doi:10.1177/0734242X251317822
	10	Circular Economy: Renewable energy
		<ul style="list-style-type: none"> Abdinasir Ahmed Abdirahman, Muhammad Asif, Osama Mohsen, Circular economy in the renewable energy sector: A review of growth trends, gaps and future directions, Energy Nexus, Volume 17, 2025, 100395, ISSN 2772-4271, https://doi.org/10.1016/j.nexus.2025.100395 World Economic Forum. 2025. Circular transformation of Industries: Unlocking Economic Value. https://reports.weforum.org/docs/WEF_Circular_Transformation_of_Industries_2025.pdf Wang, K., M. Costanza, van den Belt, G. Heath, J. Walzberg, T. Curtis, J. Barrie, P. Schroder, L. Lazer, and J. C. Altamirano. 2022. "Circular economy as a climate strategy: current knowledge and calls-to-action." Working Paper. Washington, DC: World Resources Institute. https://docs.nrel.gov/docs/fy23osti/84141.pdf
	11	Circular economy: Case of plastic waste
		<ul style="list-style-type: none"> Chapter 1 'Introduction' of the report: Global Plastic Outlook- Policy Scenarios to 2060. https://www.oecd.org/en/publications/global-plastics-outlook_aa1edf33-en/full-report.html World Economic Forum. Plastics, the Circular Economy and Global Trade. https://www3.weforum.org/docs/WEF_Plastics_the_Circular_Economy_and_Global_Trade_2020.pdf Part 1 'Summary of findings and conclusions' of the report: The New Plastic Economy- Rethinking the future of plastics. https://content.ellenmacarthurfoundation.org/m/1775fbba280fa21/original/The-New-Plastics-Economy-Rethinking-the-future-of-plastics.pdf
	12	Lecture and Documentary
		N/A
	13	Case studies from RCE on CE:
		<ul style="list-style-type: none"> Driving sustainable consumption and production at the local level- Education for sustainable development projects from the Global RCE network. https://unu.edu/sites/default/files/2023-11/Driving%20Sustainable%20Consumption%20and%20Production.pdf <p>Project RCE Buea</p> <p>Project RCE Greater Nairobi</p> <p>Project RCE Bogota</p> <p>Project RCE Czechia</p>
	14	Inclusive education: Case from RCEs
		<ul style="list-style-type: none"> Cláudio da Silva, Fátima Pereira & José Pedro Amorim (2024) The integration of indigenous knowledge in school: a systematic review, Compare: A Journal of Comparative and International Education, 54:7, 1210-1228, DOI:10.1080/03057925.2023.2184200

		https://www.tandfonline.com/doi/epdf/10.1080/03057925.2023.2184200?needAccess=true
	15	Final presentation
		N/A

Grading Policy

Rate	%	Evaluation Criteria
Individual assignment	40	Individual assignment to present oral presentation during the class on 6 November 2025, and please submit your slides via Moodle in PowerPoint slides before class by 16:00 JST on 4 November 2025.
Final presentation	20	Oral presentation of the final assignment during the class (in group) on 29 January 2026, and please submit your slides via Moodle in PowerPoint slides before the class by 16:00 JST on 27 January 2026.
Final assignment	30	Group report to write a final assignment by 16:00 JST on 30 January 2026 via Moodle in a Word file.
Class Participation	10	80% of the class attendance is required. 2% deducted per absence.

Note / URL if any

Prof. Sunil Herat

Griffith University, Australia

Sunil Herat is an Associate Professor in Waste Management and Circular Economy at Griffith University, Brisbane, Australia. He is the Program Director of the Master of Environmental Engineering and Pollution Control. He is a member of the Expert Subsidiary Group of Regional 3R and Circular Economy Forum of Asia and the Pacific, managed by the United Nations Centre for Regional Development. A/Prof Herat has over 25 years of experience in waste management, particularly on issues and challenges related to E-waste in developing and emerging economies. He is an expert on training programs in municipal solid waste management, hazardous waste management, cleaner production and eco-efficiency, and circular economy. He has extensive experience training waste management professionals in the Asia Pacific region. He has conducted training and capacity-building programs in Vietnam, Indonesia, Singapore, India, Sri Lanka, Bhutan, Thailand, and the Pacific Islands (Fiji). He is also actively involved in revising environmental regulations related to Extended Producer Responsibility (EPR) in Vietnam. He has contributed to the United Nations publication GEO 6 and United Nations University's Global E-waste Monitor 2020 and 2024.

Prof. P. Agamuthu

Sunway University, Malaysia

Dr Agamuthu FASc, is a Senior Professor (with 49 years of experience in Waste Management) in the Jeffrey Sachs Center on Sustainable Development at Sunway University (SU). He is a Global top 2% Scientist in Environmental Sciences by Stanford University. He was also the Associate Dean (Research and Postgraduate Studies) at the School of Interdisciplinary Sciences, SU. He is a Fellow of the Academy of Sciences, Malaysia since 2014. He is appointed as the High-Level End Foreign Expert for the Ministry of Science and Technology, China and is also a Visiting Professor for Zhejiang University of Technology in Hangzhou, China. He is the Chairman of the International Consultant Committee on Waste to Energy (ICCWtE), based in Zhejiang University. He was an Associate Editor/ Senior Editor in Chief of Waste Management and Research (WM&R) for 20 years, and is currently an International Advisory Board member for WM&R. He is on the editorial boards of several journals such as Journal of Material Cycles and Waste Management and Journal of Safety and Environment. He is the Vice-President of the Society of Solid Waste Management Experts in Asia and Pacific Islands (SWAPI). He is the Founder Head of the Center for Research in Waste Management and the Founder President of the Malaysian Society of Waste Management and Environment. Currently he is the Chairman for the Organization for Climate Change (OFCC), Malaysia. He is an Honorary life member of International Solid Waste Association (ISWA). He has published 22 books, 34 chapters in books and authored over 480 peer-reviewed articles, proceedings and invited papers. He has done over 75 consultancy projects and supervised over 200 Master's Degree students and 45 doctoral students. His research interest includes Solid Waste Management, Plastic and Microplastics, Marine Debris, Landfills and Biomass/Waste to Energy, ESG, to name a few. He has international networking and collaboration in several countries such as the UK, China, Austria, Japan, Korea, India, Norway, Finland, Cambodia, Thailand, Myanmar, Sri Lanka, to name a few.

Prof. P. Kaparaju

Griffith University, Australia

Prof. Prasad Kaparaju has 22 years of research experience in Environmental Biotechnology and Bioprocess

Engineering and Waste Management. His current research areas include biomass to biofuels conversion technology, anaerobic digestion, biomass pretreatment, biogas upgrading to bioCNG, biogas and biohydrogen production, and circular bioeconomy. Prof. Kaparaju is the leading Australian researcher in anaerobic digestion and biogas/biohydrogen technology. Previously, Prof. Kaparaju has worked as an academic and researcher in Finland, Denmark, and as a visiting researcher in France and Arizona State University, USA. Prof. Kaparaju has published more than 125 research papers and supervised several undergraduate and graduate students. Prof. Kaparaju is an active member of Bioenergy Australia and Member of Taskforce on Waste Management and Biogas in Australia and IEA H2 Task Force. He has conducted several training programs for the Department of Foreign Affairs & Trade, Government of Australia, in Renewable Energy Systems and Waste to Energy in Indonesia and Mongolia.