

Carbon Footprints and Carbon Accounting

Fall 2024 | Bren School of Environmental Science & Management

Instructor:	Caitlin Swalec caitlin.swalec@gmail.com	
Teaching Assistant:	Wen Tien Wang wentien@bren.ucsb.edu	
Description:	This course covers the basic skills and knowledge needed to understand and apply carbon accounting methodologies for corporate, government, and private purposes using established standards of practice including ISO14067, WRI's GHG Protocols, and SBTi sector methodologies. Case studies and group work will be used to reinforce technical skills (4 credits).	
Course materials:	All reading assignments will be provided or linked on the course website. Students are expected to bring laptops to class to participate in activities and readings.	
Course hours/location:	Fridays, 2:30-5pm, September 27th – December 6th BH 1424 (live, in-person unless otherwise noted)	
Office hours/location:	Wen Tien: Mondays 1-3pm BH 3001 And by Appointment	
Grading:	Interim team project memo (due Oct 25th by start of class)	5%
	Homework 1 (due Oct 25th by start of class)	10%
	Homework 2 (due Nov 8th by start of class)	10%
	Take home midterm exam (due Nov 22nd by start of class)	30%
	Final team presentation	15%
	Team project report	30%
Important dates:	No class	October 4th
	Pre-recorded class	October 11th
	Carbon accounting workshop	November 15th
	Holiday (no class)	November 29th
	Final team presentation	December 6th
	Team project report	December 6th by 11:59pm

Notes:

- While masks are not required by UCSB or Bren, they are strongly recommended by campus administration and county public health officials. Everyone will respect each individual’s decision to wear or not wear a mask. If you are ill, please do not attend class.
- Reading assignments are subject to change based on new developments in the field, student interest, etc. All material included on the midterm or quiz will be posted at least one week prior to that test.
- Email responses are guaranteed no earlier than 1 business day. That means an email sent to me on Friday may not be returned until end of day Monday. An email sent on Monday may not be returned until end of day on Tuesday. It is your responsibility to begin assignments and seek help early enough to complete the assignments on time.
- I do not track attendance and you do not need to email me about missing class. If you must miss class, it is your responsibility to get lecture notes from another student. If you are missing class for a legitimate reason (such as illness), you may reach out via email or office hours to discuss a plan to make up assignments. Missed quizzes/exams will be arranged with the TA.

Course Objectives:

- Educational:
 - Learn the basic history and theory of carbon footprinting and accounting.
 - Understand the core standards and tools used in carbon accounting.
 - Understand the main benefits and risks of carbon accounting methods, including ESJ implications.
- Professional:
 - Explore the range of careers related to carbon accounting.
 - Learn about and connect with professionals and/or organizations engaged in carbon accounting work.
 - Use carbon accounting tools and case studies to apply carbon accounting theory to real life examples.
 - Practice giving a professional webinar (final presentation).

Course Schedule:

Week 1	September 27th	Introduction to carbon accounting. Includes: <ul style="list-style-type: none">- Scope 1, 2, & 3 emissions overview- Types of footprints (organizational, supply-chain, product, etc.)- Standards and protocols used in practice for footprinting- Carbon neutrality vs. net zero- Introduction to team projects Reading: <ul style="list-style-type: none">- Review ISO 14064 (parts 1-3) https://www.iso.org/search.html?q=14064- What are Scope 1, 2, & 3 emissions? https://www.persefoni.com/blog/scope-1-2-3-emissions- Beginner’s guide to CDP:
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		https://persefoni.com/newsroom/CDP-carbon-disclosure-project
Week 2	October 4th	No class
Week 3	October 11th	<p>Recorded class (no in-person session)</p> <p>The Greenhouse Gas Protocol (weeks 3-5). Includes:</p> <ul style="list-style-type: none"> - GHG Protocol - The GHG Emissions Calculation Tool - CDP and climate disclosures - ISO14097 and green finance - Scope 1 emission calculation activity - Land use change emissions - REDD+ - Ghost carbon credits - Transition vs. physical risk <p>Reading:</p> <ul style="list-style-type: none"> - WBCSD/WRI's GHG Corporate and Corporate Value Chain Standards: https://ghgprotocol.org/corporate-standard and https://ghgprotocol.org/standards/scope-3-standard - How CDP Drives Corporate Climate Disclosure: https://www.hbs.edu/environment/podcast/Pages/podcast-details.aspx?episode=3173455014 - Estimating and Reporting the Comparative Emissions Impacts of Products: https://ghgprotocol.org/estimating-and-reporting-avoided-emissions - We need better GHG accounting: https://hbr.org/2022/04/we-need-better-carbon-accounting-heres-how-to-get-there - Product level GHG accounting issues: https://ghgprotocol.org/blog/many-companies-inaccurately-estimate-climate-benefits-their-products
Week 4	October 18th	<p>The Greenhouse Gas Protocol (weeks 3-5) continued.</p> <p>Reading:</p> <ul style="list-style-type: none"> - UNFCCC Introduction to Land Use: https://unfccc.int/topics/land-use/the-big-picture/introduction-to-land-use - What on Earth is REDD+? https://www.conservation.org/blog/what-on-earth-is-redd - Commentary on Ghost Credits: a Carbon Conundrum:

		<p>https://stanfordeconreview.com/2022/03/20/commentary-ghost-credits-a-carbon-conundrum/</p> <ul style="list-style-type: none"> - REDD+ and ESJ issues: https://www.forest-trends.org/blog/how-to-redesign-climate-funding-to-better-support-the-amazons-indigenous-communities/
Week 5	October 25th	<p><i>Homework 1 due by start of class</i></p> <p><i>Interim team project summary memo due by start of class</i></p> <p>Scope 2 and Scope 3 emissions. Includes:</p> <ul style="list-style-type: none"> - Scope 2 and 3 emission calculations - Energy sector emissions - Heavy industry emissions - Net Zero 2050 report and decarbonization pathways <p>Required reading:</p> <ul style="list-style-type: none"> - WBCSD/WRI's GHG Scope 2 and Scope 3 Guidance https://ghgprotocol.org/scope_2_guidance and https://ghgprotocol.org/scope-3-technical-calculation-guidance - Carbon Trust briefing on Scope 3 emissions https://www.carbontrust.com/resources/briefing-what-are-scope-3-emissions - Green Technology Choices https://www.resourcepanel.org/reports/green-technology-choices - IEA Net Zero 2050 (read at least press release): https://www.iea.org/reports/net-zero-by-2050 - Input-Output Analysis and Carbon Footprinting: https://goo.gl/Jsmz7q
Week 6	November 1st	<p>Scope 3 emissions continued and pervasive issues in carbon accounting. Includes:</p> <ul style="list-style-type: none"> - Scope 3 emission calculations - Boundary setting - Carbon accounting and ESJ <p>Required reading:</p> <ul style="list-style-type: none"> - Continued from Week 5
Week 7	November 8th	<i>Homework 2 due by start of class</i>

		<p>Special topics in carbon accounting</p> <p>Wrap up of any other material</p> <p>Required reading:</p> <ul style="list-style-type: none"> - Carbon Brief's guide on carbon offsets and carbon trading https://interactive.carbonbrief.org/carbon-offsets-2023/ - State Trends of Carbon Pricing 2022 https://openknowledge.worldbank.org/handle/10986/37455 - Should carbon removal be treated as waste management? Lessons from the cultural history of waste https://royalsocietypublishing.org/doi/10.1098/rsfs.2020.0010
Week 8	November 15th	Tentative carbon accounting workshop for undergrads
Week 9	November 22nd	<p><i>Take home midterm due by start of class</i></p> <p>Scope 3 emissions and interpretation of carbon footprint results. Includes:</p> <ul style="list-style-type: none"> - Identifying hotspots and setting priorities - Sensitivity analysis and uncertainties - Validation and verification protocols <p>Required reading:</p> <ul style="list-style-type: none"> - Carbon Colonialism https://www.researchgate.net/publication/337622634_Carbon_Colonialism_A_postcolonial_assessment_of_carbon_offsetting - MRV 101: Understanding Measurement, Reporting, and Verification of Climate Change Mitigation https://www.wri.org/research/mrv-101-understanding-measurement-reporting-and-verification-climate-change-mitigation - Science Based Targets guidance on scope 3 https://sciencebasedtargets.org/resources/files/SBT_Value_Chain_Report-1.pdf - CDP Technical Note: Relevance of Scope 3 Categories by Sector https://cdn.cdp.net/cdp-production/cms/guidance_docs/pdfs/000/003/504/original/CDP-technical-note-scope-3-relevance-by-sector.pdf?1649687608
Week 10	November 29th	Holiday (no class)
Week 11	December 6th	<p><i>Final team presentations (15 minutes per group)</i></p> <p><i>Final team project reports due by 11:59pm</i></p>