

ESM 282: Pollution Prevention

Syllabus, Spring 2024

Time & Place: Mon & Wed, 2:00-3:15pm, BH 1424 (no class 5/27)
Reading Quizzes: 6, unannounced.
Assignments: 2, see schedule below for start and submission dates.
Term Paper: Is due on Friday, June 8, 11:59pm.
Instructor: Roland Geyer, rgeyer@ucsb.edu
TA: Jaenna Wessling, jaenna@ucsb.edu
Grading: 6 reading quizzes (6 x 6%), 2 assignments (2 x 17%), 1 term paper (30%)
Course Book:

The Business of Less: The Role of Companies and Households on a Planet in Peril
Roland Geyer, 2021, Routledge, London, UK

Available on: <https://ares.library.ucsb.edu/ares/ares.dll?Action=10&Form=50&Value=115294>

Date	Topics & Readings
Session 1: Introduction	
Mon, 4/1	Topics: <ul style="list-style-type: none">• Industrial ecology• Pollution control versus pollution prevention
Session 2: Why less?	
Wed, 4/3	Topics: <ul style="list-style-type: none">• Global fossil CO2 emissions• Global material production• Global gross domestic product Reading: <ul style="list-style-type: none">• The Business of Less, Chapter 1
Session 3: A brief history of business and the environment	
Mon, 4/8	Topics: <ul style="list-style-type: none">• The story of leaded gasoline• The modern environmental movement• The birth of corporate sustainability Reading: <ul style="list-style-type: none">• The Business of Less, Chapter 2
Session 4: It's not easy being green when you're color blind	
Wed, 4/10	Topics: <ul style="list-style-type: none">• What is a green product?• What is a green company? Reading: <ul style="list-style-type: none">• The Business of Less, Chapter 3

Session 5: Life Cycle Assessment	
Mon, 4/15	<p>Topics:</p> <ul style="list-style-type: none"> • Environmental intensities and assessments • System boundaries <p>Reading:</p> <ul style="list-style-type: none"> • White & Chester (2014) Framework of Life Cycle Assessment, Chapter 1 in: Environmental Life Cycle Assessment – Measuring the Environmental Performance of Products, Schenck & White, Editors (Eds.), American Center for Life Cycle Assessment. <p><i>Start first assignment</i></p>
Session 6: The problem with eco-efficiency	
Wed, 4/17	<p>Topics:</p> <ul style="list-style-type: none"> • The rebound effect • Absolute vs. relative decoupling <p>Reading:</p> <ul style="list-style-type: none"> • The Business of Less, Chapter 4
Session 7: Material flow analysis	
Mon, 4/22	<p>Topics:</p> <ul style="list-style-type: none"> • Stocks, flows, processes • Use phase modeling • End-of-life modeling <p>Reading:</p> <ul style="list-style-type: none"> • Geyer (2020) A Brief History of Plastics, Chapter 2 in: Mare Plasticum – The Plastic Sea, Streit-Bianchi, Cimadevila & Trettnak (Eds.), Springer, Berlin, Germany. <p><i>Submit first assignment</i></p>
Session 8: Why win-win won't work	
Wed, 4/24	<p>Topics:</p> <ul style="list-style-type: none"> • Cost savings and indirect rebound • Making versus maximizing profit <p>Reading:</p> <ul style="list-style-type: none"> • The Business of Less, Chapter 5
Session 9: Net green	
Mon, 4/29	<p>Topics:</p> <ul style="list-style-type: none"> • Car sharing case study • Net green analysis <p>Reading:</p> <ul style="list-style-type: none"> • The Business of Less, Chapter 6 <p><i>Start term paper</i></p>

Session 10: Again – Part 1	
Wed, 5/1	<p>Topics:</p> <ul style="list-style-type: none"> • Circular economy / reuse and recycling / supply loops • Supply loop constraints <p>Reading:</p> <ul style="list-style-type: none"> • The Business of Less, Chapter 7
Session 11: Again – Part 2	
Mon, 5/6	<p>Topics:</p> <ul style="list-style-type: none"> • Circular economy indicators • Circular economy rebound • Closed-loop versus open-loop recycling <p>Reading:</p> <ul style="list-style-type: none"> • Geyer, Kuczenski, Zink & Henderson (2015) Common Misconceptions about Recycling, <i>Journal of Industrial Ecology</i> 20(5): 1010-1017
Session 12: Different – Part 1	
Wed, 5/8	<p>Topics:</p> <ul style="list-style-type: none"> • Material, product, technology substitution <p>Reading:</p> <ul style="list-style-type: none"> • The Business of Less, Chapter 8
Session 13: Different – Part 2	
Mon, 5/13	<p>Topics:</p> <ul style="list-style-type: none"> • Environmental burden shifting revisited • Net green substitutions <p>Reading:</p> <ul style="list-style-type: none"> • Geyer (2016) The Industrial Ecology of the Automobile, Chapter 18 in: <i>Taking Stock of Industrial Ecology</i>, Clift & Druckman (Eds.), Springer, Berlin, Germany <p><i>Start second assignment</i></p>
Session 14: Less	
Wed, 5/15	<p>Topics:</p> <ul style="list-style-type: none"> • Dematerializing passenger transportation • Less input per output versus less output • The case of aluminum <p>Reading:</p> <ul style="list-style-type: none"> • The Business of Less, Chapter 9

Session 15: Labor, not materials	
Mon, 5/20	<p>Topics:</p> <ul style="list-style-type: none"> • Production inputs (energy, materials, labor) • Reverse rebound effect • Ecological tax reform <p>Reading:</p> <ul style="list-style-type: none"> • The Business of Less, Chapter 10 <p><i>Submit second assignment</i></p>
Session 16: Policy for pollution prevention	
Wed, 5/22	<p>Topics:</p> <ul style="list-style-type: none"> • Extended producer responsibility • Bans, mandates, incentives • Case study: Plastics <p>Reading:</p> <ul style="list-style-type: none"> • TBD
Session 17: Net green for companies	
Wed, 5/29	<p>Topics:</p> <ul style="list-style-type: none"> • Net green for households <p>Reading:</p> <ul style="list-style-type: none"> • The Business of Less, Chapter 11
Session 18: Net green for households	
Mon, 6/3	<p>Topics:</p> <ul style="list-style-type: none"> • Net green for households <p>Reading:</p> <ul style="list-style-type: none"> • The Business of Less, Chapter 12
Session 19: Guest lecture	
Wed, 6/5	<p style="text-align: center;">Decarbonization approaches in Google hardware Dr. Joe Palazzo Technical Program Manager - Environmental Sustainability, Google</p>
Field Trip to Tajiguas Landfill and the ReSource Center	
TBD	<p style="text-align: center;">Carlyle Johnston, ReSource Manager, Department of Public Works, County of Santa Barbara</p> <p>Reading:</p> <ul style="list-style-type: none"> • http://www.lessismore.org/ SB County Resource Recovery & Waste Management Division