ENST 351, ISE 351, PSYC 351

Systems Thinking for Sustainability

Units: 4
Spring Semester 2025
10:00 - 11:50 a.m. (Lecture/Discussion)
Location: MHP B7B

Instructors:
Dr. Julie Albright   Prof. Edward Maby
Office: To be arranged and Zoom   Office: PHE 536
Office Hours: TBD   Office Hours: TBD
Contact Info: albright@usc.edu   Contact Info: maby@usc.edu

Catalogue Description

Analysis of the complex interplay of technical, social, psychological, and environmental factors to address real-world sustainability challenges.

Course Description

Have you ever thought about what goes into making a simple sandwich? It starts with wheat from a field that turns into flour at a mill, becomes bread at a bakery, and finally ends up at your home via a supermarket. The journey involves trains, trucks, and complex information systems, all enabled by various energy sources. In this course, we delve into the systems that support the intricate journey of everyday objects, like a sandwich, from their origins to our homes.
Our exploration isn't limited to the physical journey—spanning agriculture, manufacturing, and distribution—but extends into the realm of sociology, social psychology, psychology, communications, environmental studies, and even gaming, social media, and documentary film. We will analyze how objects are entwined with complex social and psychological processes, including human behavior, societal norms, and the environmental impact of their production and consumption.

Our focus is on the intricate interplay between physical infrastructure systems (commodities, energy, water, transportation, and information) and the broader social, political, economic, and environmental contexts. We will examine infrastructure challenges and opportunities in relation to the mega-trends that shape our world: rapid population growth, the escalating demand for data, and the economic evolution of regions like India, China, and the Global South. Special attention will be given to the green transition and its impact on various stakeholders, particularly indigenous and underserved communities. We'll explore how their lives are disproportionately affected by the pursuit of resources for modern technologies, leading to issues such as pollution

and e-waste. An underlying objective of all of these endeavors is the assessment and means of promoting sustainability, the balancing of social, environmental, and economic attributes.

A key aspect of this course is understanding how psychological and social psychological theories—such as persuasion, conformity, and group dynamics—influence public perception and behavior towards sustainable infrastructure. We will explore innovative methods like gamification and the use of media to foster pro-environmental attitudes and behaviors. These strategies are pivotal in promoting sustainable development that is equitable and respects traditional ecological knowledge.

By the end of this course, you will have gained a comprehensive understanding of the physical and social dimensions of complex systems. You will be equipped with a diverse set of strategies to promote sustainable behaviors and systems, using insights from psychology and social psychology to navigate the multifaceted challenges of our interconnected world. This interdisciplinary approach makes the course relevant not only to engineering students but also to those studying sociology, psychology, environmental studies, public policy, and other majors.

Learning Objectives

Upon completing this course, students will be able to:
- Analyze infrastructure system structures, focusing on resource accumulation (stocks), flows, and regulatory linkages, with an emphasis on environmental resource management.
- Investigate stakeholder roles and behaviors in infrastructure systems using social psychology and sociology principles to understand group dynamics and social influences.
- Assess infrastructure sustainability, incorporating environmental, economic, social equity, and risk and resilience factors, drawing on environmental studies and sociological concepts.
- Link infrastructure system dynamics to standard system archetypes, applying systems thinking and psychological theories of human behavior and decision-making.
- Develop sustainable intervention strategies for infrastructure systems, integrating environmental, psychological, and sociological approaches for behavior change and community engagement.

Prerequisite(s): None
Co-Requisite(s): None
Concurrent Enrollment: None
Recommended Preparation: None. The course assumes no particular mathematics/technical background.

Course Notes

In this course, we adopt an interactive "flipped" classroom approach, where the learning extends beyond traditional lectures. Before coming to class, you'll engage with the material by

watching prerecorded lectures and reviewing relevant academic papers at your own pace. These resources will be available on Brightspace.

In our classroom sessions, we'll bring these concepts to life through practical applications. Expect to participate in case studies that explore real-world scenarios, engage in mock city council meetings to simulate stakeholder discussions, and delve into examples through a discussion format. This hands-on approach aims to enhance your understanding and application of the course material in dynamic, real-life contexts.

Required Readings

There is no required textbook. See the class schedule for required readings from the literature, which will be posted on Brightspace. In preparation for each class, students are expected to read and reflect on one assigned paper and two recommended papers (from a list). Be prepared to discuss your chosen papers in class, highlighting their relevance to the week's topics.

Optional Readings and Supplementary Materials

Your instructors may suggest optional readings – as new books and papers debut on this topic throughout the semester.

Description of Assignments and How They Will Be Assessed

Students will submit six short papers on an assortment of topics. Short papers are 3-4 pages each, double-spaced. Topics for each are as follows:

Individual Paper Topics and Focus Areas:

1. **Paper 1: Introduction and Your Definition of Sustainability**
   - **Understanding of Sustainability:** Clear definition and understanding of sustainability in a personal or global context.
   - **Personal Insight:** Reflection on personal beliefs and values regarding sustainability.

2. **Paper 2: Case Study on the Social License to Operate**
   - **Analysis of Social License:** Understanding and analysis of the concept and its importance in business or projects.
   - **Real-world Application:** Examples of how social license to operate affects real-world projects or businesses.

3. Paper 3: Case Study on the Tragedy of the Commons
- **Conceptual Understanding:** Clear explanation of the tragedy of the commons and its implications.
- **Case Study Analysis:** Examination of a real-life instance where the tragedy of the commons is evident.

4. Paper 4: Case Study on Environmental Justice
- **Understanding of Environmental Justice:** Exploration of what environmental justice means and its importance.
- **Case Study Analysis:** Investigation of a real-world example where environmental justice is at play.

5. Paper 5: Case Study on Sustainability Ethics
- **Understanding Sustainability Ethics:** Discussion of an ethical problem pertaining to an agricultural infrastructure system.
- **Real-world Application:** Analysis of the problem for a particular system.

6. Paper 6: Case Study on Transportation Service
- **Analysis of Transportation Issues:** Examination of sustainability issues related to transportation services.
- **Solutions and Innovations:** Discussion of sustainable solutions or innovations in transportation.

Qualitative Assessment Criteria for Short Papers:

1. **Logic of Argument (Score: 0-20 points)**

- **Coherence:** The paper should present a clear, logical flow of ideas from the introduction to the conclusion.
- **Persuasiveness:** Arguments should be compelling and supported by evidence.
- **Critical Thinking:** The paper should demonstrate an ability to critically analyze concepts, rather than merely describing them.
- **Relevance:** Arguments should directly address the paper topic and questions posed.

2. **Resources Cited (Score: 0-15 points)**

- **Quality:** References should be credible, relevant, and appropriately academic.
- **Integration:** The paper should effectively integrate cited resources to support arguments.
- **Variety:** A range of sources should be consulted, avoiding over-reliance on a single source.
- **Citation Format:** Sources should be correctly cited in the paper, following the required citation style.

3. **Quality of Writing (Score: 0-15 points)**

- **Clarity:** Writing should be clear, concise, and free of jargon.

- **Grammar and Spelling:** Papers should be free from grammatical errors and spelling mistakes.
- **Style:** The writing style should be appropriate to the paper's academic nature.
- **Structure:** The paper should have a clear structure, including an introduction, body, and conclusion.

Final Notes:

- **Originality:** Papers must be the original work of the student.
- **Length and Format:** Each paper should be 3-4 pages, double-spaced, adhering to the format guidelines provided.
- **Submission:** Assignments are made on Thursdays (see class schedule) and are <u>due on or before the second Monday that follows</u>.

Semester Project:

Project Overview:

The group project requires teams to select an infrastructure system and analyze it from a systems thinking perspective, emphasizing sustainability. The analysis should cover various facets including system causality, social, environmental, and economic impacts, as well as resilience and overall conclusions. The project culminates in a major paper and a presentation, both of which should reflect a comprehensive understanding of systems thinking applied to sustainable infrastructure. All team members will receive equal grades, contingent on team members' confirmation of their participation. Teams are limited to three students, maximum.

Qualitative Assessment Criteria for Project:

System Causal Description (Score: 0-50 points)
- **Clarity and Detail:** Provides a clear, detailed description of the infrastructure system, including all relevant components and their interactions.
- **Systems Thinking Application:** Demonstrates effective application of systems thinking principles, identifying feedback loops, leverage points, and systemic structures.

Social Analysis (Score: 0-50 points)
- **Stakeholder Consideration:** Identifies and considers the perspectives and impacts on all relevant stakeholders.
- **Social Equity:** Evaluate the social equity implications of the infrastructure, considering access, impacts, and benefits distribution among different societal groups.

Environmental Analysis (Score: 0-50 points)
- **Environmental Impact:** Analyzes the environmental impacts of the infrastructure system, considering both local and global effects.
- **Sustainability Considerations:** Evaluate how the system contributes to or detracts from environmental sustainability, including resource use, pollution, and habitat disruption.

Economic Analysis (Score: 0-50 points)
- **Cost-Benefit Analysis:** Conducts an economic analysis from a sustainability perspective, considering short-term and long-term economic impacts.
- **Economic Viability:** Assesses the economic viability and sustainability of the infrastructure, including funding sources, financial sustainability, and economic resilience.

Risk and Resilience Analysis (Score: 0-50 points)
- **System Resilience:** Evaluates the resilience of the infrastructure system to shocks and stresses, including natural disasters, economic changes, and social shifts.
- **Adaptation Strategies:** Identifies and assesses strategies for enhancing the system's resilience and adaptability to future challenges.

Conclusions (Score: 0-50 points)
- **Insightfulness:** Draws insightful, well-supported conclusions from the analyses conducted, highlighting key findings.
- **Recommendations:** Provides clear, actionable recommendations for improving the sustainability and resilience of the infrastructure system.

Writing Quality (Score: 0-50 points)
- **Clarity and Coherence:** The paper is well-written, with clear, coherent arguments and logical flow.
- **Grammar and Spelling:** Free from grammatical errors and spelling mistakes.
- **Formatting:** Properly formatted according to guidelines, with appropriate use of headings, figures, and tables.

Project Deliverables:

- **Major Paper:** A comprehensive analysis following the outlined criteria, structured appropriately with an introduction, body sections corresponding to each analysis category, and a conclusion. The paper should be properly cited and formatted as per academic standards. The paper length should be 12-15 pages, double spaced.
- **Presentation:** A clear, engaging presentation summarizing the key findings and recommendations of the analysis. The presentation should effectively communicate the team's analysis and conclusions to an audience, incorporating visual aids as necessary. Presentations will be given in the final week of class. The presentation score reflects the first six categories of project scoring and one score that reflects the quality and organization of the presentation material. Individual scores will be between 0 and 5 points, and the total will be normalized to 100 points, maximum.

Group Collaboration:

- **Teamwork:** Students are expected to collaborate effectively, with a clear distribution of responsibilities and cooperative development of the project.
- **Peer Evaluation:** Members may be required to provide feedback on the contribution of their peers to ensure a fair assessment of individual contributions.

Submission Guidelines:

- Follow the provided format and submission guidelines.

- Ensure timely submission of all project components.
- Include all team members' names and contributions in the submission.

Final Notes:

- This project is an opportunity to apply systems thinking to real-world issues in sustainability. It should reflect a deep understanding of the chosen infrastructure system and a thoughtful analysis of its sustainability from multiple perspectives.
- Originality and critical thinking are highly valued in the evaluation of the project.
- Team members will receive identical scores.

Grading Breakdown

Grading: Letter grade

Assessment Tool (assignments)	Points
Short papers (6)	300
Project paper	350
Project presentation	100
Final exam	250
TOTAL	1000

Assignment Submission Policy

Short papers are due by the end of the Monday that follows weeks 2, 4, 6, 8, 10, and 12. Scores will be reduced by 25% for each day of a late submission. Papers will be returned the following Monday.

Attendance

Attendance for the in-class activities and case-study exercises is crucial for fulfilling course objectives. Student total scores will drop by 3 points for each unexcused absence beyond four (15 points maximum). Students observing religious obligations and subject to athletic travel will be excused with advance notification.

Academic Integrity

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students

through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form). This course will follow the expectations for academic integrity as stated in the USC Student Handbook. All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.
The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

Since creating, analytical, and critical thinking skills are part of the learning outcomes of this course, all assignments should be prepared by the student working individually or in groups. Students may not have another person or entity complete any substantive portion of the assignment. Developing strong competencies in these areas will prepare you for a competitive workplace. Therefore, using AI-generated tools like ChatGPT is prohibited in this course, will be identified as plagiarism, and will be reported to the Office of Academic Integrity.

Course Evaluations

Course evaluation occurs at the end of the semester university-wide, online. It is an important review of students' experience in the class. In addition, a mid-semester evaluation is requested by the university for early course correction.

Black - Lecture Topic   Blue - Required Reading Prior to Class Discussion
Red - Assignments   Green - Recommended Supplementary Readings

Week 1 -

Tuesday, 14 January

Sustainability and the Built Environment

Sustainability: An Economist's Perspective - Solow

Creating the Future We Want - Hecht et al.
    Response - Stutz   *Rejoinder* - Hecht et al.
Is Sustainability Sustainable? - Bonevac
The Limits to Growth and the Limits to Computer Modeling - Hayes
Environmental Alarmism, Then and Now - Lomborg
Transforming Our World: The 2030 Agenda for Sustainable Development
     - United Nations
Infrastructure: A Field Guide to the Industrial Landscape - Hayes
     Invaluable Resource, Highly Recommended!
Report Card for California's Infrastructure: 2019 - ASCE

Thursday, 16 January

Systems Thinking

Systems Thinking as a Paradigm Shift for Sustainability Transformation
     - Voulvoulis et al.

Systems Integration for Global Sustainability - Liu et al.
Integrated Infrastructure Systems—A Review - Saidi et al.
Resilience, Adaptability, and Transformability in Social-Ecological Systems
     - Walker et al.
Catastrophic Shifts in Ecosystems - Scheffer et al.
Infrastructure as a Complex Adaptive System - Oughton et al.
Complexity, Problem Solving, Sustainability and Resilience - Tainter and Taylor

Assignment: Personal introduction and sustainability perspective (Paper 1) - Due 24 January

Week 2 -

Tuesday, 21 January

Running the System: Core Actors

*The Role of Organizational Structure and Values in the Performance of Critical
     Infrastructure Systems* - Little

The Social Requirements of Technical Systems - Whitworth
Path Dependence in Energy Systems and Economic Development - Fouquet
Understanding Carbon Lock-In - Unruh

Thursday, 23 January

Engaging the System: Peripheral Actors and the Social License to Operate

The Social License to Operate: A Critical Review - Moffat et al.

The Inner Dimension of Sustainability: Personal and Cultural Values - Horlings
The Politics of Sustainability and Development - Scoones
*Sustainability and Regime Type: Do Democracies Perform Better in Promoting
        Sustainable Development than Autocracies?* - Wurster
The Drivers of Greenwashing - Delmas and Burbano

Assignment: Notice of Team Memberships for Project (not graded) - Due 7 February

Week 3 -

Tuesday, 28 January

Commodity Chains

A Framework for Sustainable Materials Management - Fiksel

Strategies for Improving the Sustainability of Structural Metals - Raabe et al.
*Global Lithium Sources—Industrial Use and Future in the Electric Vehicle Industry:
        A Review* - Kavanagh et al.
*Towards the Lithium-Ion Battery Production Network:
        Thinking Beyond Mineral Supply Chains* - Bridge and Faigen
Energy-Critical Elements for Sustainable Development - Hurd et al.
Rare Earth Elements—Critical Resources for High Technology - USGS
Aluminum, Commodity Chains, and the Environmental History of the Second World War
        - Evenden

Thursday, 30 January

Whose Resources? The Tragedy of the Commons and the Free-Rider Problem

The Tragedy of the Commons - Hardin
Extensions of the "Tragedy of the Commons" - Hardin

Tending the Infrastructure Commons: Ensuring the Vitality of Our Public Systems - Little
The Struggle to Govern the Commons - Dietz
Nothing to Fear but a Lack of Fear: Climate Change and the Fear Deficit
        - Lowenstein and Schwartz
A Looming Tragedy of the Sand Commons - Torres et al.
The Climate Club - Nordhaus
Climate Clubs: Politically Feasible and Desirable? - Falkner et al.

Assignment: Case Study on the Social License to Operate (Paper 2) - Due 7 February

Week 4 -

Tuesday, 4 February

Stocks and Flows I - Energy (Water, Land Use, and Nonrenewable Resources)

Stocks, Flows, and Prospects of Energy - Löschel et al.

On the Sustainability of Renewable Energy Sources - Edenhofer et al.
Stocks, Flows, and Prospects of Land - Seto et al.
Stocks, Flows, and Prospects of Mineral Resources - MacLean et al.
Infrastructure and the Environment - Doyle and Havlik

Linkages of Sustainability - Graedel and van der Voet (Highly recommended)

Thursday, 6 February

What Resources? Energy Poverty / Equity

Energy and Social Issues - Reddy

Energy Poverty: An Overview - González-Eguino
Climate Change and Social Inequality - Islam and Winke
Evaluating Equity and Justice in Low-Carbon Energy Transitions - Kime et al.
The Political Economy of Energy Poverty: A Review of Key Challenges - Sovacool

Week 5 -

Tuesday, 11 February

Stocks and Flows II - Water (Energy, Land Use, and Nonrenewable Resources)

Groundwater in Peril - Jones

Global Hydrological Cycles and World Water Resources - Oki and Kanae
Water and Energy Interactions - McMahon and Price
Water Scarcity: The Most Understated Global Security Risk - Stuckenberg and Contento
*A System Dynamics Model to Facilitate Public Understanding of Water Management
        Options in Las Vegas, Nevada* - Stave

Thursday, 13 February

Who Has a Voice? Environmental Justice

Environmental Justice - Mohai et al.

*Renewable Energy for Whom? A Global Systemic Review of the Environmental Justice
        Implications of Renewable Energy Technologies* - Levenda et al.
Toolkit for Assessing Potential Allegations of Environmental Injustice - EPA
A Case Study of Environmental Injustice: The Failure in Flint - Campbell et al.
The Flint Water Crisis: What Happened and Why - Masten et al.

Assignment: Case Study on the Tragedy of the Commons (Paper 3) - Due 21 February

Week 6 -

Tuesday, 18 February

Sustainable Agriculture

Solutions for a Cultivated Planet - Foley

Agricultural Sustainability and Intensive Production Practices - Tilman et al.
Net Carbon Flux from Agricultural Ecosystems:
Methodology for Full Carbon Cycle Analyses - West and Marland
Nitrogen in Crop Production: An Account of Global Flows - Smil
Phosphorus in the Environment: Natural Flows and Human Interferences - Smil
Global Consequences of Land Use - Foley et al.
Anatomy and Resilience of the Global Production Ecosystem - Nyström et al.
System Dynamics Modeling for Agricultural and Natural Resource Management Issues:
Review of Some Past Cases and Forecasting Future Roles - Turner et al.

Thursday, 20 February

Sustainability Ethics

Sustainability Science: Ethical Foundations and Emerging Challenges -
Nelson and Vucetich

Sustainability: Virtuous or Vulgar - Vucetich and Nelson
The Psychology of Environmental Decisions - Newell et al.
The Agricultural Ethics of Biofuels: The Food vs. Fuel Debate - Thompson
Principles of Water Ethics - Jennings et al.
The Politics and Poetics of Infrastructure - Larkin

Week 7 -

Tuesday, 25 February

Growing the Network: Human Demographics

Migration and Climate Change: An Overview - Piguet et al.

Global Population Growth and Sustainable Development - United Nations
Assessment of the Natural Environment: A Determinant of Natural Preferences -
Weichart
Urbanization, Rural-Urban Migration, and Urban Poverty- Tacoli et al.
An Ill Wind? Climate Change, Migration, and Health - McMichael et al.
Complexity and Unintended Consequences in a Human Security Crisis:
A System Dynamic Model of the Refugee Migration to Europe - Taylor and Masys

Thursday, 27 February

Growing the Network: Patterns of Development

Electric Vehicles and Psychology - Viola

Smart Growth: A Prescription for Livable Cities - Geller
Urban Patterns for a Green Economy: Optimizing Infrastructure - UN Habitat
Spatial Structure and Evolution of Infrastructure Networks - Dunn et al.
The Size, Scale, and Shape of Cities - Batty
The Dynamics of Brownfield Redevelopment - BenDor et al.
Charging Infrastructure Planning for Promoting Battery Electric Vehicles:
        An Activity-Based Approach Using Multiday Travel Data - Dong et al.

Assignment: Case Study on Environmental Justice (Paper 4) - Due 7 March

Week 8 -

Tuesday, 4 March

Green Data: Digital Infrastructure and Sustainability

Green Data: A 4-Pillar Approach for Green Data Centers - Deloitte

A New Methodology Toward Effectively Assessing Data Center Sustainability -
        Lykou et al.
The Resilient Community and Communication Practice - Nicholls
The Big Smart-Grid Challenges - Bullis
The Bright Future of the Internet of Things - Campolargo

Thursday, 6 March

Information in an Era of Hyperconnectivity

Online Misinformation About Climate Change - Treen et al.

Expert Survey on the Global Information Environment 2024 - IPIE
The Digital Divide: A Review and Future Research Agenda - Lythreatis et al.
Online Community as Space for Knowledge Flows - Faraj et al.
Toward New Guardrails for the Information Society - Bauer

Assignment: Notice of Tentative Project Topic (not graded) - Due 14 March

Week 9 -

Tuesday, 11 March

Dynamic Urban Systems

Designing and Advancing a Systems Approach for Sustainable Cities - Bai et al.

Cities as Systems of Networks and Flows - Batty

Cities, Systems, and Sustainability: Status and Perspectives of Research on Urban Transformations - Wolfram et al.
Measuring the Complexity of Urban Form and Design - Boeing

Thursday, 13 March

Smart Communities   Regenerative Infrastructure

Smart Growth: A Prescription for Livable Cities - Geller

Regenerative—The New Sustainable - Gibbons
Sustainability is Not Enough: We Need Regenerative Cultures - Wahl
The Concept of a 'Regenerative City': How to turn cities Into Regenerative Systems - Schurig
Towards Modern Sustainable Cities: Review of Sustainability Principles and Trends - Sodiq et al.

17 March - 21 March   SPRING BREAK

Week 10 -

Tuesday, 25 March

Moving People and Freight

Public Transportation and Sustainability: A Review - Miller et al.

The Future of Transportation in Sustainable Energy Systems: Opportunities and Barriers in a Clean Energy Transition - Dominkovic et al.
Addressing Sustainability in Transportation Systems: Definitions, Indicators, and Metrics - Jeon and Amekudzi
A Review of System Dynamics Models Applied in Transportation - Shepherd

Thursday, 27 March

Transport Service: Who Benefits? Who Pays? (Albright)

Do Artifacts Have Politics? - Winner

A Systematic Overview of Transportation Equity in Terms of Accessibility, Emissions, and Safety Outcomes: From Conventional to Emerging Technologies - Guo et al.
Effects of Diesel Engine Emission Controls on Environmental Equity and Justice - Patterson and Harley
Understanding the Role of Equity in Active Transportation Planning in the United States - Lee et al.

Assignment: Case Study on Sustainability Ethics (Paper 5) - Due 4 April

Week 11 -

Tuesday, 1 April

Getting Things Built

Sustainable Project Management Through Project Control in Infrastructure Projects
    - Kivila et al.

The Sustainable Project Management: A Review and Future Possibilities - Chawla et al.
Integrating Sustainability Issues into Project Management - Sánchez
An Ethical Approach Towards Sustainable Project Success - Mishra et al.
Greening Project Management Practices for Sustainable Construction
    - Robichaud and Anantatmula

Thursday, 3 April

Regulatory Oversight

Solving the Problems We Face: The United States Environmental Protection Agency,
    Sustainability, and the Challenges of the Twenty-First Century - Hecht and Fiksel

Moving from Protection to Prosperity: Evolving the U.S. Environmental Protection
    Agency for the Next 50 Years - Anastas and Zimmerman
The EPA at 40: An Historical Perspective - Andrews
Politics, Political Leadership, and Public Management - Cook

Assignment: Project Progress Report - Due 11 April

Week 12 -

Tuesday, 8 April

Social Media Campaigns

Green Sustainability and New Social Media - Williams et al.

Can We Tweet, Post, and Share Our Way to a More Sustainable Society?
    A Review of the Current Contributions and Future Potential of
    #Socialmediaforsustainability - Pearson et al.
Domestic Wastewater Recycling: "Toilet-to-Toilet" and "Tap-to-Tap" Instead of
    "Toilet-to-Tap" - A New Approach - Antholz
Organizational and Celebrity Activism - Collins
Environmental Movements in Advanced Industrial Democracies: Heterogeneity,
    Transformation, and Institutionalization - Giugni and Grasso

Thursday, 10 April

Documentaries and Film

Green Shooting: Media Sustainability, A New Trend - Lopara-Mármol et al.

"No Fracking Way!" Documentary Film, Discursive Opportunity, and Local Opposition

against Hydraulic Fracking in the United States, 2010 to 2013 - Vasi et al.
Entertaining Our Way to Engagement? Climate Change Films and Sustainable Development Values - Lindenfeld and McGreavy
Communicating Climate Change Through Documentary Film: Imagery, Emotion, and Efficacy - Bieniek-Tobasco et al.

Assignment: Case Study on Transportation Service (Paper 6) - Due 18 April

Week 13 -

Tuesday, 15 April

The Economic Pillar of Sustainability

Assessing the Cost of Regulatory Proposals for Reducing Greenhouse Gas Emissions - Aldy

Thirty Years of Economics at the Environmental Protection Agency - McGartland
Duke's Fifth Fuel - Cicchetti
Sustainable Finance - Edmans and Kacperczyk
Creating Shared Value: How to Reinvent Capitalism—and Unleash a Wave of Innovation and Growth - Porter and Kramer

Thursday, 17 April

Behavioral Gamification

Gamification: The Intersection Between Behavior Analysis and Game Design Technologies - Morford and Killingsworth

Gamification to Prevent Climate Change: A Review of Games and Apps for Sustainability - Douglas and Brauer
A Survey on the Design of Gamified Systems for Energy and Water Sustainability - Albertarelli et al.
A Review of Water-Related Serious Games to Specify Use in Environmental Multi-Criteria Decision Analysis - Aubert et al.
Gamification and Serious Games Within the Domain of Domestic Energy Consumption: A Systematic Review - Johnson et al.

Week 14 -

Tuesday, 22 April

Risk and Resilience

A Methodological Approach to Political Risk - Little

Engaging with the Politics of Sustainability Transitions - Meadowcroft
The Centrality of Communication and Media in Fostering Community Resilience: A Framework for Assessment and Intervention - Houston et al.
The Resilient Community and Communication Practice - Nicholls

Thursday, 24 April

Distributing Risk: Microgrids and Microsystems

Possibilities, Challenges, and Future Opportunities of Microgrids: A Review - Sharzad

Understanding Microgrid Sustainability: A Systemic and Comprehensive Review
- Boche et al.
Sustainable Microgrids: Economic, Environmental, and Social Costs and Benefits
of Microgrid Deployment - Parag and Ainspan
Understanding the Community in Community Microgrids: A Conceptual Framework
for Better Decision Making - Eklund et al.

Week 15

Student Presentations

Final Exam - Refer to the final exam schedule in the USC *Schedule of Classes.*

Statement on Academic Conduct and Support Systems

Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. ([Living our Unifying Values: The USC Student Handbook](), page 13).

Students and Disability Accommodations

USC welcomes students with disabilities into all of the University's educational programs. [The Office of Student Accessibility Services]() (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [osas.usc.edu](). You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

[Counseling and Mental Health]() - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline]() - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services (RSVP)](#) - (213) 740-9355(WELL) – 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).
[Office for Equity, Equal Opportunity, and Title IX (EEO-TIX)](#) - (213) 740-5086
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.
[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.
[The Office of Student Accessibility Services (OSAS)](#) - (213) 740-0776
OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.
[USC Campus Support and Intervention](#) - (213) 740-0411
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.
[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.
[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.
[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call
Non-emergency assistance or information.
[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.
[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.