GLOBAL 253:
Infrastructures and Technologies of Globalization
Tuesdays 3:00-5:50pm, SSMS 2001

Xiaolangdi Dam, Jiayuan. Film still from Edward Burtynsky and Jennifer Baichwal’s Watermark, 2014.

Professor Charmaine Chua
Office: SSMS 2133
Email: chua@global.ucsb.edu
Office Hours: Tuesdays 12-2pm or by appointment

COURSE DESCRIPTION:

While infrastructures such as sewage systems, electrical grids, and railroads are often understood as “boring things” (Star 1999) – the underlying material substrata that support our everyday lives – the study of technological innovation often focuses on hyper-visible modern artifacts and systems of technical hardware – from the automobile to the iPhone and the drone – that alter the relations between human ends and their technical means. This course aims to bring the study of technical artifacts and their underlying systems together, considering their co-constitutive role as powerful transformative forces in shaping and reflecting processes of globalization. Drawing attention to the transformative social force of large-scale socio-technical systems, we will consider how technical arrangements and physical systems produce and reflect various forms of
global order. Course themes include: the historical development of mechanization, industrialization and processes of mass automation in the making of global capitalism and militarism; the role of technology in social difference (class, race, gender, sexuality, disability etc.); histories of conflict around the access, use, and the construction of infrastructural and technological projects; and the ways in which transportation infrastructures and technologies have been crucial in remaking global dynamics such as displacement, extractivism, unemployment, disease, etc. Specific examples examined might include railroads, electricity, undersea cables, logistics and energy systems, bitcoin, the cloud, financial technologies, drones, and border surveillance technologies.

REQUIRED TEXTS:
There is one book required for this course. (Conveniently, it has been made available for download at the publisher’s link below). I have also included a list of books from which we will be reading substantial sections. In all cases, I will have PDFs on Gauchospace, but if you prefer reading hard copies, you may consider purchasing them if you so choose. I have not ordered any of these at the bookstore. Please purchase them from your favorite bookseller.


Optional texts:

READINGS:
All readings are posted on Gauchospace, with the exception of the required text above. Check the syllabus carefully before starting your readings each week. Additional sources may be of interest or relevant to your specific research topics and chosen approaches, so they are included for your reference and their potential utility in formulating your final project.

ASSIGNMENTS AND GRADING:
- Class Discussion and Participation, including two in-class presentations: 40%
- Reading responses: 20%
Research Paper: 40%

1. **Class Participation (40%)**
   a. As this is a seminar course, a main requirement is thoughtful participation during all classes. Students are expected to not only attend all classes having completed all weekly readings, but set aside time to think through them before coming to class.
   b. Most of your work involves reading academic books and articles. Reading all the material is essential. Before you plunge in, I strongly recommend reading Paul N. Edwards, “How to Read a Book.” Even the most accomplished and experienced students, postdocs, and faculty find this guide useful for getting through large amounts of reading in limited amounts of time.
   c. PhD students in the humanities and social sciences are taught to critique. That is a crucial skill. But you should not conflate critique with criticism. Critique represents serious engagement, while criticism all too often involves demolition. Make every effort to engage with readings on their own terms. What did the author intend? Who is their audience? What value can you find in their arguments? Is the evidence they present persuasive — does it support these arguments? Would additional (or different) evidence have produced a different argument?

**Leading Class Discussion**

d. Twice in the quarter, sometimes in partnership with another student, you will lead class discussion. Students will sign up for their presentation during the first class meeting.

e. Start by preparing a presentation that introduces the readings and places them in conversation with each other. These prefatory remarks should be aimed at opening up questions or topics for discussion. These presentations should not aim merely at summary, but should rather introduce major themes, common confusions or questions, or background to the contexts or authors discussed. The bulk of the presentation should be focused on the reactions you had to ideas you see as particularly profound, interesting, or unconvincing in the readings, and pull out common themes to introduce a few questions for class discussion.

f. Do a little research on the author(s). What’s their disciplinary background? What else have they published? Look for information that illuminates the arguments you read, and that helps to situate them relative to other literature. You could look at reviews of some of the suggested readings to help you with this task, or use Edwards’s techniques to browse through a few of them.

g. Please prepare a short handout as an aid to class discussion. This handout should be brief, listing 3-4 analytical points you found most significant for the session. Accompany each analytical point by a discussion question. **This handout**
should be written in outline of bulleted form. Do not exceed 1 single-sided page. Please bring paper copies to distribute to your classmates.

h. At the beginning of that class session or section, you will spend no more than 15 minutes (max, will be timed) presenting background (5-7 min) and elaborating on your discussion questions (8-10 min). These presentations MUST be delivered without reading from a text (a skill you should all be practicing!). All presenters should participate equally.

i. At the end of this presentation, you (and your partner if applicable) will lead discussion for at least 30 minutes. This is an active process: don’t just say "what do you think?" and then wait for replies! You should have several strategies planned so that you can adapt to the flow of the discussion as it evolves. You may cold-call your classmates if they aren’t cooperating with your leadership.

2. Reading Responses (20%)  
Due on GauchoSpace by 6pm the day before class.

   a. You will each write three short reading responses in total. Specific prompts are posted at the end of each week's reading list. You will choose which prompts you would like to write a response for, and email me your preferences by the end of Week 1 of the quarter.

   b. You'll notice that most of these aren't standard "respond to the reading" assignments. Instead, they constitute invitations to experiment with genre. In all cases, the product should be polished, well-crafted, and free of typos. In most cases, I have assigned readings by writers whose prose, in addition to their arguments, I greatly admire. Read the texts with a mind to how they compose and tell the stories of their worlds. Chase down passive constructions, proliferating prepositional phrases, and other forms of verbal throat-clearing. Edit ruthlessly. This takes time, so you should leave yourself time to edit and revise. Be sure to respect word limits. These are all important academic skills; they only come naturally after a lot of practice.

3. Research Paper (40%)  
Final paper due March 19th at 5pm. I would like a paper copy in my mailbox, but if you are not in town, you don't have to do this. Please also send me a digital copy by email.

Here are some possible options:

   a. A substantial research paper on an original topic of your choice (3500-4000 words max) on a topic of your choosing. There is great room for pursuing your own interests, but at minimum the research paper must investigate or produce an argument about the politics of technology and/or infrastructure that falls within the seminar’s themes, broadly defined. Students are encouraged to begin work on that paper as soon as possible.

   b. One approach, if you have trouble coming up with an idea, is to conduct research on a particular technology, technique, or infrastructure in a given space.
or region, and to tell a story about power, social difference, ecology, human/non-human relations, etc. through this infrastructure. E.g. What do landmines in the DMZ of North Korea tell us about everyday militarism? What are the social and political factors that led to the decommissioning of oil rig platforms off the coast of Santa Barbara?

c. You may choose to use this opportunity to compose an annotated bibliography for your dissertation or thesis, or to write a prospectus for your dissertation (PhD students only). Please discuss this with me beforehand.

d. You may also choose to write review essay of 5-6 books (or the equivalent in articles) of around 3500-4000 (max) words (not including references). You may select a group of texts from the Additional Sources portion of each week, or assemble your own coherent group

Research proposal + initial bibliography

Due printed, in class, Week 6, and uploaded to Gauchospace by the end of the day.

Please prepare a research paragraph that does not exceed one page, and which briefly outlines the contours of your final project. We will discuss the formatting in greater detail closer to the middle of the quarter, but it should try to address the following questions:

- Question and Issue: What are you proposing to investigate, and why should anyone care? (You might build a very brief literature review into this section.)
- Hypotheses and Tentative Argument: What are potential answers to this question, and which seems likely to prove most useful/insightful/revealing/correct (pick your epistemological stance)?
- Research Plan: How will you go about demonstrating your argument? What evidence would you use to test your hypotheses/evaluate your argument/demonstrate your claims? Make sure you explain how you would know if you were wrong.
- Implications: What do you expect you will find/show? What are the implications of your findings?
- Initial Bibliography and References

**IMPORTANT DATES**

- Staggered: 3 reading responses, due 6pm on the day before class
- Staggered: Lead 2 class discussions
- Week 6: Research proposal due in class
- March 19th: Final paper due
COURSE READINGS
Please read all readings in the order that they appear on the syllabus.

Topics of Sessions
1. Thinking technology politically
2. Infrastructures of globalization
3. Technopolitics, Coloniality, Race
4. Automation and the Future of Work
5. Mega-projects
6. The digital and its conditions of possibility
7. Energy
8. Planetary sensing and techno-environments
9. Militarism
10. Catastrophic Times

Week 1, T 1/7: Thinking technology politically

  - Optional (included in the PDF): Chapter 4, p. 61-84

  - Optional (included in the PDF): Introduction, p. 1-17

Additional Sources
- Lewis Mumford, Technics and Civilization or The Myth of the Machine
- Jacques Ellul, The Technological Society
- Langdon Winner, Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought
- David E. Nye, Technology Matters: Questions to Live With
- Wiebe Bijker, Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change
- Nelly Oudshoorn and Trevor Pinch, eds., How Users Matter: The Co-Construction of Users and Technology
- Shoshanna Zuboff, In the Age of the Smart Machine: The Future Of Work And Power
- David Edgerton, The Shock of the Old: Technology and Global History Since 1900
- Fred Turner, From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism
- Philip Mirowski, Machine Dreams: Economics Becomes a Cyborg Science
Week 2 T 1/14: Introductory Concepts – Infrastructures of globalization


**Reading response:**
Put Braudel's classic text in conversation with Carse, Larkin, and Comaroff and Comaroff. In what ways does Braudel's early (1979) approach to materialist method and the global spread of technology have echoes or resonances that you see in the later development of the field of infrastructure studies? What similarities – methodologically, epistemologically, disciplinarily – do they share? In what ways do you read these texts as being in conversation with each other? (1000 words max)

**Additional Sources:**
Week 3 T 1/21: Technopolitics, Coloniality, Race

- Michelle Murphy. 2017. The Economization of Life. Selections TBD

**Reading response:**

What is the relationship between technology, power, and social difference? (1000 words max)

**Additional Sources**

- Ruth Schwartz Cowan, More Work for Mother: The Ironies Of Household Technology From The Open Hearth To The Microwave
- Francesca Bray, Technology, Gender and History in Imperial China: Great Transformations Reconsidered
- Marie Hicks, Programmed Inequality: How Britain Discarded Women Technologists and Lost Its Edge in Computing
Week 4 T 1/28: Automation and the Future of Work


Reading Response:
How are Benanav and Noble’s essays responding to or in conversation with Marx’s Fragment on Machines? What are the arguments each are making about automation? What is your analysis of these arguments? (1000 words max)

Additional Sources
- Melissa Wright. 2006. Disposable Women and Other Myths of Global Capitalism
- David Graeber. 2018. Bullshit Jobs
- Shoshanna Zuboff. 2019. In the Age of the Smart Machines
- Jeremy Rifkin. 1995. The End of Work
- Ronald Munck: "The Precariat: A View from the South." Third World Quarterly
Week 5 T 2/4: Mega-projects


Reading Response:
Why are mega-projects built or pursued? What is at stake in the pursuit of them? What imaginaries do they conjure? In what ways do these imaginaries relate to power and control, as opposed to economic or infrastructural necessity? (Take these questions as a starting point for a response; you do not have to answer them all.) (1000 words)

Additional Sources
- Stephen Ramos, Dubai Amplified: The Engineering of a Port Geography (Chapters 1, 3)
- WorldBank, 2007. “Construction, corruption, and developing countries”
- Gaston Gordillo, Rubble: the afterlife of destruction
Week 6 T 2/11: The digital and its conditions of possibility

- Julie Klinger. 2017. Rare Earth Frontiers: From Terrestrial Subsoils to Lunar Landscapes. Cornell University Press. Chapter 1 “What are Rare Earth Elements?” and “Placing China in the World History of Discovery, Production and Use” 41-66 and 67-102 (skim chapter 2 if you’re running out of time, but it’s a good read)
- Josh Lepawsky and Charles Mather. 2011. “From beginnings and endings to boundaries and edges: rethinking circulation and exchange through electronic waste” Area 43(3): 242-249 (Good theoretical framing that helps tie all these articles together)

Reading response:
Find one or two journalistic / newspaper articles, or one academic article or book about digital capitalism or the digital age, that you think insufficiently recognizes the material basis and underlying structures of the internet or other digital artifacts. What analytic leverage do these readings offer to such misconceptions? How would a materialist approach to the digital age change how such articles discuss digital or internet culture? Bring the articles you found to class to share with us.

Additional Sources:
- Digital Map of Undersea Cables (© Nicole Starosielski, Eric Loyer, Shane Brennan; http://surfacing.info)
- Brian Larkin, Signal and Noise: Media, Infrastructure, and Urban Culture in Nigeria
- Mariel Borowitz, The Global Effort for Open Access to Environmental Satellite Data
- Benjamin Peters, How Not to Network a Nation: The Uneasy History of the Soviet Internet
- Samuel Greengard, The Internet of Things
- Thomas Hendricks, “SIM cards of desire: Sexual versatility and the male homoerotic economy in urban Congo” in American Ethnologist
- Daniel Headrick, Tentacles of Progress, Chapter 4
- Simon Rogers, “The World’s Undersea Internet Cables” in The Guardian
• Adam Greenfield, Radical Technologies: The Design of Everyday Life (Chapter 5 on Bitcoins)
• Ingrid Burrington, “Why Amazon’s Data Centers Are Hidden in Spy Country”
• Ingrid Burrington, “A Network of Fragments”
• Joon Ian Wong and Johnny Simon, “Photos: Inside one of the world’s largest bitcoin mines”
• Zach Sokol, 2015. “Photographs of the Underwater Telecommunication Cables Tapped by the NSA” in Vice. Also look up Trevor Paglen’s work on how he went about creating these pieces.
Week 7 T 2/18: Energy


Reading Response:
Find a photograph that expresses or depicts an aspect of or historical moment in the quest for energy. Write an analytical response close reading the photograph in relation to the three texts. (1000 words)

Additional Sources:

- Hannah Appel et al, eds., Subterranean Estates: Life Worlds of Oil and Gas
- John McPhee, “Coal Train” in New Yorker
- Christopher Jones, Routes of Power: Energy and Modern America
- David Nye, Consuming Power: A Social History of American Energies
- The Standing Rock Syllabus
- Andrew Barry, Material Politics: Disputes Along the Pipeline
Week 8 T 2/25: Militarism


Reading response:
Imagine that you’ve organized a big university event on the topic of Militarism and technology featuring Pugliese, Gregory and Bousquet. It’s up to you to introduce the theme of the panel, why these interrogations are important in our contemporary moment, and how the three presenters’ work are in conversation with each other. Write this introduction. (1000 words max)

Additional Sources
Week 9 T 3/3: Technological Planetarity and the Environment


**Reading response:**
Playing the role of a book press review, write a peer-review report of Gabrys's book for a university press. Base your discussion of how it relates to existing literature with reference to other relevant readings we have done and a quick perusal of the suggested readings. (1000 words max)

**Additional Sources**
- Columba Peoples, “Extra-Terrestrial Technopolitics: The politics of technology in space” 182-20
- Michelle Murphy, Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience, and Women Workers
- Geoffrey C. Bowker and Susan Leigh Star, Sorting Things Out: Classification and Its Consequences
- Theodore M. Porter, Trust in Numbers: The Pursuit of Objectivity in Science and Public Life
- Rudolf Mrázek, Engineers of Happy Land: Technology and Nationalism in a Colony
- Stefan Helmreich, Alien Ocean: Anthropological Voyages in Microbial Seas
- Ken Alder, The Measure of All Things: The Seven Year Odyssey and the Hidden Error that Transformed the World
- Cultures of Energy Podcast No. 185 (with guest Andrew Blum, http://culturesofenergy.com/185-andrew-blum/)
- Curtis, Adam. 2011. All Watched Over By Machines of Loving Grace (Episode 2: The Use and Abuse of Vegetational Concepts)
Week 10 T 3/11: Catastrophic Times
Options (pick one book or four articles):


Small Bites (choose 3)

- Kian Goh. "California’s Fires Prove the American Dream is Flammable." The Nation, December 23.
- UN Emissions Gap Report. 2018. UNEP.
- CLARA. “The Role of the Land Sector in Ambitious Climate Action.” (see their whole site for good article recommendations)
- Podcast: “Malaysia Vows to Send Back illegal recycling shipments to countries including the US.” Kate O’Neill on The Takeaway.

Reading Response:
Use the readings as inspiration to write a personal essay on your own encounters with or responses to apocalypse, catastrophe, and the end of the world. (1000 words)

Additional Sources
- See the work of Jonas Mahm http://www.jonasmahn.com/papers.html
- See the work of Jonas Meckling: http://www.jonasmeckling.com/
- What Is Equity in the Context of Climate Negotiations?,” World Resources Institute (2012)
COURSE POLICIES

Use of Laptops, Tablets and Phones: Laptops or tablets are allowed during class to reference readings, participate in activities, or take notes. Cell phones must be silenced and out of sight during class. If I see your cell phone during class time, I will ask you to please put it away. You are expected to be mentally present during class time. Communication devices/modes should be off. Only use your laptop to refer to the readings. We can all tell when you’re using it for other purposes: it’s not only rude, but also distracting. I will call you out if I get the sense that you’re off in the fourth dimension.

Food and Drink: You are welcome to drink water or other non-alcoholic beverages during class, preferably in a bottle with a lid. There will be a brief break in the middle of each seminar, after about an hour, during which you are welcome to eat snacks.

Academic Integrity: Plagiarism, cheating, turning in others’ work as your own, and any other forms of academic dishonesty are absolutely not tolerated and will be subject to consequences in line with university regulations. Academic dishonesty devalues the learning experience and the value of UCSB degrees not only for offenders, but for the whole community. It is your responsibility to know the campus’s rules regarding academic integrity, so please read the UCSB Student’s Guide to Academic Integrity here:
https://judicialaffairs.sa.ucsb.edu/CMSMedia/Documents/academicintegflyer.pdf. This guide to academic citations may also be helpful:

Excuses and Extensions: I do not accept late assignments or excuse class absences, except in cases of documented, serious personal, medical, or legal problems. Legitimate excuses are usually situations where an employer would excuse you from work: illness requiring medical attention, jury duty, documented family emergency, travel required by your employer, or an official school activity. All anticipated conflicts with class meetings should be explained to me at least two weeks in advance, and arrangements will be made to write a longer reading response or meet at a different time to ensure that you gain familiarity with the week’s materials.

Students with Disabilities: UCSB is committed to providing full participation and access for students with disabilities. If you plan to request accommodations, please contact the Disabled Students Program (https://dsp.sa.ucsb.edu/). They can be reached by visiting the Student Resource Building, Room 2120, by emailing DSP.Help@sa.ucsb.edu, or by phone (805.893.2668) or fax (805.893.7127).

Policy on Children in Class: UCSB does not currently have a policy on children in the classroom, but the policies here reflect my own commitments to making the classroom accessible for students who are parents or guardians.
1. All exclusively breastfeeding babies are welcome in class as often as is necessary.
2. For older children and babies, if disruptions in childcare put parents or guardians in the position of having to miss class or stay home with a child, it is perfectly acceptable to occasionally bring a child to class to cover gaps in childcare.

3. If you do bring a baby or older child to class, I ask that you please sit closer to the door, so that if your child needs special attention or is disrupting learning for other students, you can quickly step outside until their needs have been met.

Themes I could not include but that may be of interest.

Toxicity

City Shit
- Susan E Chaplin, 2011, “Indian cities, sanitation and the state: the politics of the failure to provide” in Environment and Urbanization 13(1)
- Susanna Smets, 2015, “Turning finance into services for the future : a regional synthesis of the service delivery assessments for water supply and sanitation in East Asia and the Pacific” WorldBank
- Dominique Laporte, A History of Shit
- Heather Rogers, Gone Tomorrow: The Hidden Life of Garbage
- Donald Reid, Paris Sewers and Sewermen: Realities and Representations
• Assa Doron and Robin Jeffrey, Waste of a Nation: Garbage and Growth in India (forthcoming)
• Rosalind Fredericks, 2014. “Vital Infrastructures of Trash in Dakar” in Comparative Studies of South Asia, Africa and the Middle East 34(3).

Capital, Austerity, Debt

Small bites (choose 3):
• Mizes, James Christopher. “Who Owns Africa’s Infrastructure?” Limn 7 (July 2016).
• Park, Emma and Kevin P. Donovan. “Between the Nation and the State.” Limn 7 (July 2016).

Urbanism and the City
• Ahmed Kanna, Dubai: City as Corporation
• Mike Davis, City of Quartz
• Andrew Friedman, Covert Capital: Landscapes of Denial and the Making of U.S. Empire in the Suburbs of Northern Virginia
• Stephen Graham and Simon Marvin, eds. Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition
• Stephen Graham, Colin McFarlane eds., Infrastructural Lives: Urban Infrastructure in Context
Mobility and Logistics

- Cowen, Deborah. The Deadly Life of Logistics. University of Minnesota Press 2014