

EAS 537: Urban Sustainability | Syllabus

University of Michigan | Fall 2021 | 3 Credits

Tuesday and Thursday, 2:30pm-4:00pm

Dana 1046

Course Information

Instructor: Joshua P Newell

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School for Environment and Sustainability

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Office Hours: Tuesday, 1:30pm – 2:30pm.

Dana 1040

Course Description

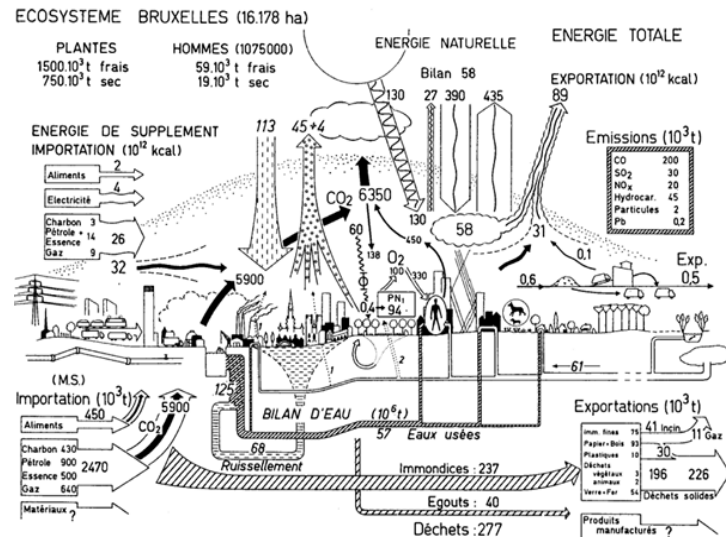
As engines of capital accumulation, cities have often been viewed as environmental sacrifice zones. Some critics have argued that ‘sustainable cities’ is an oxymoron. Nonetheless, the debate over sustainable development generally, and sustainable urbanism specifically, has succeeded in reshaping and broadening discourse around cities and attendant policies and outcomes – both in industrialized and industrializing countries. Implying that sustainable use of natural resources involves social justice and economic development as well as environmental concerns, the notion of sustainability has led away from narrower conceptions of urban environmentalism, toward more consideration for the future, greater integration of social and economic goals with environmental and ecological objectives, and hence a fundamental rethinking of how cities should be theorized, planned and managed.

This course introduces graduate students to the emerging field of urban sustainability from multiple disciplinary perspectives, primarily industrial ecology, urban political ecology, urban ecology, and planning. The course provides students with the theoretical and methodological tools in which to explore the potential for a sustainable urbanism. Approaches to foster more sustainable and resilient forms of urbanization and urban life – ranging from localization, to industrial symbiosis, to ecological restoration – will be introduced and evaluated. Course deliverables include a midterm exam, a group case-project, a group material flow analysis project, and three essays. Meetings with stakeholders and other actors who shape the city form additional course components.

Learning Objectives

By the end of this course, you should be able to:

1. Connect sustainability concepts and technology to real-world urban challenges, including individual/social needs and political debates;
2. Understand the importance (and difficulty) of defining and fostering urban sustainability;
3. Present complex material to a diverse audience in a succinct and effective manner;
4. Facilitate effective discussions, while being attentive to diverse opinions and perspectives;
5. Read and write more effectively, both essential skills for your future.



Urban Metabolism of Brussels, Duvigneaud and Denaeyer-De Smet (1977).

Course Structure

The course is divided into four interdependent sections: 1. *Conceptual Foundations of Urban Sustainability*; 2. *Learning through Cases: Urban Agriculture and the Midterm*; 3. *Form and Flows of the City: Theory and Case Studies*; and 4. *Synthesis and Moving Forward*. The course meets twice a week for 1.5 hours each time and includes lecture, discussion of readings, presentation of cases, and building-block activities. The course has an experiential component with periodic in-class exercises. The primary deliverables, which are graded, are as follows: 1) Course participation; 2) two essay papers; 3) a midterm exam; 4) and a group case study project.

Safety and COVID-19

This course will be primarily in-person, with a few class sessions online. We will follow all UM mandated protocols, including properly wearing a face covering. Individuals seeking to request an accommodation related to the face-covering requirement under the Americans with Disabilities Act should contact the [Office for Institutional Equity](#). If you are unable or unwilling to adhere to these safety measures while in a face-to-face setting for these two classes, then please contact me.

Course Resources

Canvas will be the primary vehicles of instruction, with use of Google Drive and other online resources. ***Students are required to attend class at the prescribed times (i.e. Tues and Thurs from 2:30-4:00).*** Community building exercises have also been woven into the fabric of the course to support student productivity and mental health. We will have a 5-10 minute break halfway through class. *Course lectures may be audio/video recorded and made available to students in this course. As part of your participation in this course, you may be recorded. If you do not wish to be recorded, please contact me the first week of class (or as soon as you enroll in the course, whichever is latest) to discuss alternative arrangements. Students are prohibited from recording/distributing any Class Activity without written permission from the instructor, except as necessary as part of approved accommodations for students with disabilities. Any approved recordings may only be used for the student's own private use. Please refer to the [ITS Recording and Privacy Concerns FAQ](#) for additional details.*

Required Texts

You are required to purchase one book: **Schimel, J. (2012). *Writing Science: How to write papers that get cited and proposals that get funded*. Oxford University Press.** We also *strongly* recommend you purchase **Cronon, W. (2009). *Nature's Metropolis: Chicago and the Great West*. WW Norton & Company.** Both texts are in your local bookstore and can also be purchased on Amazon.com or other internet booksellers (and relatively inexpensively). The remaining readings, both required and supplemental, are available in pdf form on Canvas. We will provide ample notice of minor changes to readings in class and a revised syllabus will be shared. Readings have been carefully selected, with particular attention to the reading load, which varies considerably over the semester. For some class sessions, the reading load is considerable, and for others there is no required reading at all.

Assignments & Grading

Grading

Your course grade includes work completed as an individual and as a group. Your course grade will be based on a midterm exam, two short essay papers, a group case study, and class participation as determined by attendance, by completion of in-class exercises, and by discussion contributions. **All assignments are due by noon EST on the due date listed in the course schedule.** The grading

breakdown is as follows:

<i>Group Deliverable</i>		<i>Individual Deliverables</i>	
Assignment	Percentage of total grade	Assignment	Percentage of total grade
Case Summary	3%	Essay Papers (2)	22%
Case Material	16%	Mid-term Exam	20%
Case Presentation	16%	Attendance	10%
		In-class exercises	6%
		Discussion of reading	7%
Total	35%	Total	65%

Grades will be posted in the “Gradebook” tab in Canvas. Final grades are based on the total percentage received for the semester.

Essay Papers

You are required to write two short essays. These essays should be a minimum of three pages in length, and a maximum of five pages (double spaced, 1” margins, and 12 pt Times New Roman font). All ideas, terms, and quotes that are not your own need to be properly cited in your essay. For these two essays, please use the APA referencing style and include a bibliography at the end of your essay. This bibliography does not count towards the length requirement. Your essays will be evaluated based on the clarity and completeness, as well as on spelling, grammar, and referencing. The required text by Schimel will form the stylistic basis for these essays. The essay assignments will be discussed in class and posted on Canvas at least two weeks prior to their due date. The due dates for the essays are: Essay #1, November 11th; Essay #2, December 9th. These essays should be submitted through Canvas (as an uploaded Microsoft Word doc) and are due by the beginning of class on these days. You will turn in and receive comments on your essays via Canvas. Be sure to answer the essay question(s) completely and be sure to proofread your essays carefully before submitting them.

Exam

There is a midterm exam on **October 12th**. This exam covers the first portion of the course. There is no final exam.

Case Study

Each student will contribute to presenting a case study as part of a student team (5-6 students in each team). These case studies are divided into three graded components:

1. **1-page Case Summary**
2. **Case Materials and Edge Notes (~3-4 pages)**
3. **Case Presentation**, with an in-class activity that you’ve designed to engage your classmates on the topic or in discussing the Case Materials.

These case studies will also include the following:

- **Use of mass media or interviews** (news articles, audio-visual media, etc.) to convey the multiple perspectives on the topic;
- **Use of Social Explorer** (SocialExplorer.com), a “**Story Map**” (<https://storymaps.arcgis.com/en/>), **or another interactive mapping tool** to convey the spatial, demographic, and socio-economic context of the topic;
- **Use of at least one urban sustainability indicator.**

We will talk more about the structure of a case study and how to develop one in class.

In-Class Exercises and Activities

Urban sustainability is a topic we will explore both through the lens of expert opinion (i.e. the lectures and assigned readings) as well as through class discussions, leveraging our diverse viewpoints and experiences. In-class activities, which form a component of your participation grade, are designed to help you to engage in thoughtful discussions with your classmates on the weekly topic. Examples of these activities include:

1. **“Managing Citations in Mendeley”** - Whether you are seeking a career in research or plan to work as a sustainability expert in government or private industry, you’ll be reading papers, books, and reports. A citation manager is an essential tool for this purpose. We will use Mendeley, as it is freely available and works on all operating systems (available on Windows, Mac, and GNU/Linux). Either during or after class, you will need to sign up for a (free) account with Mendeley, download the Mendeley software client, and join the “Urban Sustainability” group.
2. **“Material Flow Analysis”** - Material flow analysis (MFA) is a technique for identifying the major inputs and outputs of a material system, ranking the relative magnitudes of the flows, and opportunities for closing loops, minimizing waste, etc. You will be expected to construct a basic model of a city’s metabolism, represent it visually as a Sankey diagram and calculate some simple indicators or circularity.
3. **“Political Ecology and Urban Ecology Exercises”** – Here you will take another group’s MFA exercise and analyze it through urban political ecology and urban ecology lenses. These analyses will be done in class on two separate days. Think about the actors that shape and are affected by the metabolism of a city. Consider how the metabolism of a city nests within biogeochemical processes that act at different temporal and spatial scales. You will provide a brief 2-page document outlining your analysis; one page for your urban political ecology assessment, one page for your urban ecology assessment. This activity will be completed in class as a group.

Discussion Participation

Class participation is awarded based on: **level of preparedness for class** (e.g., completing readings, coming to class prepared to engage in discussion), **engagement in class discussion** (e.g., oral contributions to class discussion, participation in class activities, completion of assigned posts on Canvas Discussion boards), **outside of class involvement** (e.g., group work), and **number of absences**. In order to participate fully, completing the required reading for each session is essential. We value most those discussions in which *you* are doing most of the talking. Aside from voicing comments, actively paying attention to each other is key. We understand that some students may feel uncomfortable sharing thoughts in groups, nevertheless we encourage you to express yourself. To facilitate ease, discussions will also vary in format (e.g., small-larger group discussions, activities, synchronous and asynchronous opportunities).

Course Management & Policies

Attendance

All students are expected to attend and participate in the scheduled class sessions. Unexcused absences will be reflected in final grades.

Academic Integrity

The University of Michigan seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. Plagiarism will not be tolerated and there will be severe consequences. For more information, please see <http://www.rackham.umich.edu/current-students/policies/academic-policies/section10>

Religious/Cultural Observance

Students who have religious or cultural observances that coincide with this class should let me know in writing within a week of the beginning of the term. Students who expect to miss classes, examinations, or other assignments as a consequence of their religious observance will continue to be provided with a reasonable alternative opportunity to complete their academic responsibilities. However, if a student does not contact me within this time period, I will assume the student plans to attend all class meetings.

<http://www.provost.umich.edu/calendar/>

Accommodations for Students with Disabilities

Please contact me during the first week of class so that your needs can be accommodated. You may also wish to contact Services for Students with Disabilities (G-664 Haven Hall, 505 South State St.: 734-763-3000, <http://ssd.umich.edu>).

Student Sexual Misconduct Policy

Title IX prohibits discrimination on the basis of sex, which includes sexual misconduct — including harassment, domestic and dating violence, sexual assault, and stalking. We understand that sexual violence can undermine students' academic success and we encourage anyone dealing with sexual misconduct to talk to someone about their experience, so they can get the support they need. Confidential support and academic advocacy can be found with the Sexual Assault Prevention and Awareness Center (SAPAC) on their 24-hour crisis line, 734.936.3333 and at sapac.umich.edu. Alleged violations can be non-confidentially reported to the Office for Institutional Equity (OIE) at institutional.equity@umich.edu

Diversity, Equity, and Inclusion

In this class, we are committed to creating a culture of engaged learning and establishing a climate of inclusion and harmony. We are all here to learn from each other. In this spirit, we will work to actualize University of Michigan community standards of integrity and respect by practicing active listening and respectful communication. By acknowledging differences amongst us in our backgrounds, skills, interests, and values, we will collectively grow and improve our understanding of the world. Together, we strive to cultivate a class environment where each individual feels a sense of belonging and well-being. This atmosphere is most conducive to teaching, learning, and building community.

Resources for Student Success

Writing Help

A primary objective of this course is to develop your writing skills. You may find it helpful to contact the Sweetland Writing Center, which offers free individual writing conferences for graduate students who are working on course papers, as well as dissertations, etc. In addition to the required text by Schimel, helpful research and writing aids include: *The Craft of Research* (Booth, Colomb, and Williams), *The Elements of Style* (Strunk and White), and *A Manual for Writers of Research Papers, Theses, and Dissertations* (Turabian). Online sources with useful guidance on writing include OWL on-line writing lab from Purdue

University (<https://owl.english.purdue.edu/>) and the University of Wisconsin writing handbook (<http://writing.wisc.edu/Handbook/>)

Student Mental Health and Wellbeing

University of Michigan is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) at 734.764.8312 and caps.umich.edu during and after hours, on weekends and holidays, or through its counselors physically located in schools on both North and Central Campus. You may also consult University Health Service (UHS) at 734.764.8320 and <https://www.uhs.umich.edu/mentalhealthsvcs>, or for alcohol or drug concerns, see <https://www.uhs.umich.edu/aodresources>. For a listing of other mental health resources available on and off campus, visit <http://umich.edu/~mhealth/>.

Course Schedule and Plan At-A-Glance

Day	Topic	Readings	Activity	Key Deliverables
Module 1: Conceptual Foundations of Urban Sustainability				
Tues, Aug. 31	Introduction to Course		<ul style="list-style-type: none"> ▪ Introductions ▪ COVID-19 ▪ Discussion guidelines ▪ Working in groups 	Think about your subject area interests
Thurs, Sept. 2	What is urban sustainability?	Cronon (2009) – Preface and Prologue; Ch 3 (Grain)	<ul style="list-style-type: none"> ▪ Discuss Cronon ▪ Construct mental maps of urban sustainability 	
Tues, Sept. 7	Cities and Sustainability	Revi et al. (2014); Seto et al. (2012)	<ul style="list-style-type: none"> ▪ Discuss readings ▪ Discuss case topics ▪ Managing citations in Mendeley 	Sign up for Mendeley; Join our “Urban Sustainability” Group on Mendeley
Thurs, Sept. 9	Three ‘Ecologies’: Industrial Ecology and Urban metabolism	Bai (2007); Brunner (2007); Kennedy (2007)	<ul style="list-style-type: none"> ▪ Discuss readings ▪ Material Flow Analysis exercise 	Sankey diagram of a city’s material flows
Tues, Sept 14	Three ‘Ecologies’: Urban Political Ecology	Robbins (2004); Heynen et al (2006);	<ul style="list-style-type: none"> ▪ Discuss readings ▪ PE Exercise 	PE analysis of Sankey Diagram
Thurs, Sept 16	Three ‘Ecologies’: Urban Ecology & Interdisciplinary Prospects	Grimm et al. (2008); Wu (2014); Schimel (2012), Chs. 2 and 3	<ul style="list-style-type: none"> ● Discuss readings ● PE and UE Exercise 	UE analysis of Sankey Diagram
Tues, Sept 21	Sustainability Practice: Cities, Climate Change, and Circular Economy	Next Cycle Homepage; Next Cycle GAP Analysis; Ellen MacArthur Foundation (2017)	<ul style="list-style-type: none"> ▪ Meet the Experts: Matthew Naud ● Discuss readings 	
Thur, Sept. 23	Smart Cities/Indicators of	Townsend (2013) - Introduction;	<ul style="list-style-type: none"> ● Discuss readings 	

	Urban Sustainability	European Commission (2018); Schimel (2012), Ch. 4		
Module #2: Nourishing the City, the 'Case' Approach, and Midterm				
Tues, Sept. 28	Topic: Nourishing the City	McClintock (2010); Gallagher (2010) – Ch 3; Seto and Ramankutty (2016)	<ul style="list-style-type: none"> ▪ Discuss readings ▪ Presentation of Sustainability Cases Project 	
Thur, Sept 30	Michigan Sustainability Case (MSC) Initiative	Michigan Case Initiative Reading	<ul style="list-style-type: none"> ▪ Guest Lecture: Edward Waisanen, MSC ▪ Present Case 	
Tues, Oct 5	Case Presentation: Urban Agriculture in Detroit	Case #1 Material	<ul style="list-style-type: none"> ▪ Discuss Case ▪ Meet the Experts: Jason Hawes 	
Thurs, Oct 7	Case Prep Midterm Exam Review	Schimel, Chapters 5-6 (Recommended)	<ul style="list-style-type: none"> ▪ Work in groups 	
Tues, Oct 12	Midterm Exam	No required reading	<ul style="list-style-type: none"> ▪ Multiple choice and short answer exam 	MIDTERM
Thur, Oct 14	Case Prep		<ul style="list-style-type: none"> ▪ Work in Groups 	
Module #3: Form and Flows of the City, Theory and Case Studies				
Tues, Oct 19 Fall Break NO CLASS				
Thur, Oct 21	Case Prep		<ul style="list-style-type: none"> ▪ Work in Groups 	Case Summary Due
Tues, Oct 26	Topic #1 Transportation and Urban Form	Gounaridis et al. (2020); Gallagher (2010), Ch 4; Gillham (2002)	<ul style="list-style-type: none"> ▪ Discuss readings ▪ Team #1 introduces case 	
Thur, Oct 28	Case Presentation #1 Transportation and Urban Form	Case #1 Material	<ul style="list-style-type: none"> ▪ Student-led case activity ▪ Meet the Experts: Dimitris Gounaridis 	
Urban Green Space				
Tues, Nov 2	Topic #2 Urban Green Space	Wolch et al. (2014); Trust for Public Land (2020); Gallagher (2010) - Ch 5, Ch 6	<ul style="list-style-type: none"> ▪ Discuss readings ▪ Team #2 introduces case 	Midterm Exam returned
Thur, Nov 4	Case Presentation #2 Urban Green Space	Case #2 Material	<ul style="list-style-type: none"> ▪ Meet the Experts: TBD 	
Flows of Water				
Tues, Nov 9	Topic #3 Flows of Water	Gandy (2004); McDonald et al. (2014)	<ul style="list-style-type: none"> ▪ Discuss readings ▪ Team #3 introduces case 	
Thur, Nov 11	Case Presentation #3 Flows of Water	Case #3 Material	<ul style="list-style-type: none"> ▪ Student-led case activity ▪ Meet the Experts: TBD 	Essay #1 Due
Buildings and Energy				
Tues, Nov 16	Topic #4 Buildings and Energy	Ivanova et al. (2016); Rees (2009); Goldstein et al. (2020)	<ul style="list-style-type: none"> ▪ Discuss readings ▪ Team #4 introduces case 	

Thur, Nov 18	Case Presentation #4 Buildings and Energy	Case #4 Material	<ul style="list-style-type: none"> ▪ Student-led case activity ▪ Meet the Experts: TBD 	
<i>Flows of Waste</i>				
Tues, Nov 23	Topic #5 Flows of Waste	Bengali (2020); Guibrunet et al. (2017); Kalina & Tilley (2020); Love and Rieland (2020)	<ul style="list-style-type: none"> ▪ Discuss readings ▪ Team #5 introduces case 	
Thurs, Nov 25	NO CLASS	No required reading		
Tues, Nov 30	Case Presentation #5 Flows of Waste	Case #5 Material	<ul style="list-style-type: none"> ▪ Student-led case activity ▪ Meet the Experts: TBD 	Essay #1 Returned
<i>Flows of Food</i>				
Thur, Dec 2	Topic #6 Flows of Food	Goldstein et al. (2017); Chamanara et al. (2020)	<ul style="list-style-type: none"> ▪ Discuss readings ▪ Team #6 introduces case 	
Tues, Dec 7	Case Presentation #6 Flows of Food	Case #6 Material	<ul style="list-style-type: none"> ▪ Student-led case activity ▪ Meet the Experts: Sanaz Chamanara 	
Module #4: Synthesis and Moving Forward				
Thur, Dec 9	Towards Synthesis: In the Academy, Policy, & Next Steps	Cronon (1992), Epilogue; Newell and Cousins (2014); Committee on Pathways to Urban Sustainability (2016)	<ul style="list-style-type: none"> ▪ Mental Maps Revisited ▪ Policy and Planning Exercise 	Essay #2 Due

READING LIST

*Note: this list may change slightly over the term.
You will have ample advance notice should such changes occur*

Week 1: Course Introduction

Aug. 31 and Sept. 2

Goals/ Tasks/ Deliverables

- Introductions, course guidelines and expectations
- Explore research interests, “What is urban sustainability?”
- Discuss readings

No Required Readings for Tuesday August 31

Required Readings for Thursday, September 2:

- Cronon, W. (1992). Nature's Metropolis: Chicago and the Great West. WW Norton & Company. (Preface: pp. xv- xxv and Prologue: pp. 5-19).
 - Cronon, W. (1992). Nature's Metropolis: Chicago and the Great West. WW Norton & Company. (Ch. 3 Pricing the future: Grain: pp. 97-147).
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Week 2: Cities, Sustainability, and Introduction to “The Three Ecologies:” Industrial Ecology and Urban Metabolism

Sept. 7 and Sept. 9

Goals/ Tasks/ Deliverables

- Understand and practice Material Flow Analysis (MFA); turn in Part I of the MFA assignment
- Sign up for Mendeley and join our “Urban Sustainability” Group on Mendeley;
- Discuss readings

Required Readings for Tuesday, September 7:

- Revi, A., Satterthwaite, D. E., Aragón-Durand, F., Corfee-Morlot, J., Kiunsi, R., Pelling, M., ... Solecki, W. (2014). Urban Areas. In C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, ... L. L. White (Eds.), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects* (pp. 535–612). Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.
- Seto, K. C., Reenberg, A., Boone, C. G., Fragkias, M., Haase, D., Langanke, T., ... Simon, D. (2012). Urban land teleconnections and sustainability. *PNAS*, 109(20), 7687–7692.

Required Readings for Thursday, September 9:

- Bai, X. (2007). Industrial Ecology and the Global Impacts of Cities. *Journal of Industrial Ecology*, 11(2), 1–6.
- Brunner, P. H. (2007). Reshaping urban metabolism. *Journal of Industrial Ecology*, 11(2), pp. 11-13.
- Kennedy, C., Cuddihy, J., & Engel-Yan, J. (2007). The changing metabolism of cities. *Journal of Industrial Ecology*, 11(2), pp. 43-59.

Supplemental Reading Material (Optional)

- Andrews, C. J. (1999). Putting industrial ecology into place evolving roles for planners. *Journal of the American Planning Association*, 65(4), pp. 364-375.
 - Campbell, S. (1996). Green cities, growing cities, just cities? Urban planning and the contradictions of sustainable development. *Journal of the American Planning Association*, 62(3), pp. 296-312.
 - Goldstein, B., Birkved, M., Quitzau, M. B., & Hauschild, M. (2013). Quantification of urban metabolism through coupling with the life cycle assessment framework: Concept development and case study. *Environmental Research Letters*, 8(3), 035024.
 - Graedel T.E. and Allenby B.R. (1995). *Industrial Ecology*. Prentice Hall. (Ch. 1: Introduction: pp. 2-10, Ch. 2: Overview of the industrial ecology intellectual framework: pp. 11-16, Ch. 3: Sustainable development: pp. 17-39, Ch. 4: Industrial ecology: pp. 40-62).
 - Hendrickson, C. T., Lave, L. B., & Matthews, H. S. (2006). *Environmental Life Cycle Assessment of Goods and Services: An Input-Output Approach*. Routledge. (Ch. 1: Exploring environmental impacts and sustainability through life cycle assessment: pp. 3-20 and Ch. 16: Development of regional economic input-output life cycle assessment models: pp.160-168).
 - Kennedy, C., Pincetl, S., & Bunje, P. (2011). The study of urban metabolism and its applications to urban planning and design. *Environmental Pollution*, 159(8), pp. 1965-1973.
 - Leach, M. A., Bauén, A., & Lucas, N. J. (1997). A systems approach to materials flow in sustainable cities: A case study of paper. *Journal of Environmental Planning and Management*, 40(6), pp. 705-724.
 - McGranahan, G., & Satterthwaite, D. (2003). Urban centers: An assessment of sustainability. *Annual Review of Environment and Resources*, 28(1), pp. 243-274.
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Week 3: Three Ecologies: Urban Political Ecology and Urban Ecology **Sept. 14 and Sept. 16**

Goals/ Tasks/ Deliverables

- UPE Exercise
- UE Exercise
- Discuss Readings

Required Readings for Tuesday, September 14:

- Robbins, P. (2004). The Hatchet and the Seed. In *Political Ecology: A Critical Introduction* (pp. 3–16).
- Heynen, N. C., Kaika, M., & Swyngedouw, E. (2006). Urban political ecology: Politicizing the production of urban natures. In *In the Nature of Cities: Urban Political Ecology and the Politics of Urban Metabolism* (1st ed., pp. 1–20). Routledge.

Required Readings for Thursday, September 16:

- Grimm, N. B., Faeth, S. H., Golubiewski, N. E., Redman, C. L., Wu, J., Bai, X., & Briggs, J. M. (2008). Global change and the ecology of cities. *Science*, 319(5864), 756–60.
- Wu, J. (2014). Urban ecology and sustainability: The state-of-the-science and future directions. *Landscape and Urban Planning*, 125, 209–221.
- Schimel, J. (2012). *Writing Science*. Chapter 2, pp. 8-15. Oxford, United Kingdom and New York, New York, U.S.A.: Oxford University Press.

- Schimel, J. (2012). *Writing Science*. Chapter 3, pp. 16-25. Oxford, United Kingdom and New York, New York, U.S.A.: Oxford University Press.

Supplemental Reading Material (Optional):

- Folke, C., Å. Jansson, J. Larsson and R. Costanza. (1997). Ecosystem appropriation by cities. *Ambio* 26: pp. 167-172.
 - Jones, P., Williams, J., & Lannon, S. (2000). Planning for a sustainable city: An energy and environmental prediction model. *Journal of Environmental Planning and Management*, 43(6), pp. 855-872.
 - Michael Hough. 1995. Cities and Natural Process. Routledge. (Ch. 2: Water: pp. 33-96, Ch. 3: Plants: pp. 97-164).
 - Cook, I. R., & Swyngedouw, E. (2012). Cities, social cohesion and the environment: Towards a future research agenda. *Urban Studies*, 49(9), pp. 1959-1979.
 - Gibbs, D., & Deutz, P. (2005). Implementing industrial ecology? Planning for eco-industrial parks in the USA. *Geoforum*, 36(4), pp. 452-464.
 - Walker, R. A. (2001). California's golden road to riches: Natural resources and regional capitalism, 1848–1940. *Annals of the Association of American Geographers*, 91(1), pp. 167-199.
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Week 4: City Sustainability Indicators and Practice
Sept. 21 and Sept 23

Goals/ Tasks/ Deliverables

- Discuss Readings
- Connect theory to practice

Required Readings for Tuesday, September 21:

- Browse <https://www.nextcyclemichigan.com/>
- Review <https://nextcyclemichigan.squarespace.com/s/2020-Gap-Analysis-Slide-Deck.pdf>
- Ellen MacArthur Foundation (2017). *Cities in the circular economy: an initial exploration*.

Required Readings for Thursday, September 23:

- Townsend (2013). Smart Cities. Introduction, pp. 10-33. New York and London: W.W. Norton & Company.
 - European Commission (2018). Science for Environment Policy In-Depth Report: Indicators for sustainable cities.
 - Schimel, J. (2012). *Writing Science*. Chapter 4, pp. 26-34. Oxford, United Kingdom and New York, New York, U.S.A.: Oxford University Press.
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Week 5: Nourishing the City and the “Case” Approach
Sept. 28 and Sept. 30

Goals/ Tasks/ Deliverables

- Discuss Readings
- Understand the advantages of a case study in exploring a debate
- Understand how a case study is constructed

Required Readings for Tuesday, September 28

- McClintock, N. (2010). Why farm the city? Theorizing urban agriculture through a lens of metabolic rift. *Cambridge Journal of Regions, Economy and Society*, 3(2), 191–207.
- Gallagher, J. (2010). Potential and Problems in Urban Agriculture. In *Reimagining Detroit: Opportunities for Redefining an American City* (Chapter 3, pp. 39–72).
- Seto, K. C., & Ramankutty, N. (2016). Hidden linkages between urbanization and food systems. *Science*, 352(6288), 943–945.

Required Readings for Thursday, September 30

- Michigan Case Initiative Reading
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Week 6: Urban Agriculture in Detroit & Case Prep

Oct 5 and Oct 7

Required Readings for Tuesday, October 5:

- Case Material: Urban Agriculture in Detroit

Required Reading for Thursday, October 7:

- None
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Week 7: Midterm Exam & Case Prep

Oct. 12 and Oct. 14

Goals/ Tasks/ Deliverables

- **Take the midterm exam on Tuesday, Oct. 12**
- Work in groups preparing case studies (Thursday)

Supplemental Reading Material (Optional):

- Schimel, J. (2012). Writing Science. Chapter 5, pp. 35-49. Oxford, United Kingdom and New York, New York, U.S.A.: Oxford University Press.
 - Schimel, J. (2012). Writing Science. Chapter 6, pp. 50-57. Oxford, United Kingdom and New York, New York, U.S.A.: Oxford University Press.
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Week 8: Case Prep

Oct 21

Goals/ Tasks/ Deliverables

- Work in groups preparing case studies
 - **Case Summary due Thursday, October 21th**
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Week 9: Introduction to Topic #1 Urban Form & Transportation
Oct. 26 and Oct. 28

Goals/ Tasks/ Deliverables

- Discuss readings
- Work in groups preparing case studies (Thursday)

Required Readings for Tuesday, October 26:

- Gounaridis, D., Newell, J.P. & Goodspeed, R. The impact of urban sprawl on forest landscapes in Southeast Michigan, 1985–2015. *Landscape Ecol* (2020).
- Gallagher, J. (2010). Road Diets and Roundabouts. In *Reimagining Detroit: Opportunities for Redefining an American City*. Detroit, MI, U.S.A.: Wayne State University Press. (Chapter 4, pp. 73-84)
- Gillham, O. (2002). What is Sprawl? In *The Limitless City: A Primer on the Urban Sprawl Debate* (pp. 23). Washington, D.C., U.S.A.: Island Press and The Center for Resource Economics.

Required Readings for Thursday, October 28:

- Team #1's Case Materials and Edge Notes
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Week 10: Introduction to Topic #2 Urban Green Space & Case Presentation
Nov. 2 and Nov. 4

Goals/ Tasks/ Deliverables

- Discuss readings
- Team #2 presents its case study on an urban green space topic
- Midterm exams returned

Required Readings for Tuesday, November 2:

- Wolch, J. R., Byrne, J., & Newell, J. P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities “just green enough.” *Landscape and Urban Planning*, 125, 234–244.
- Trust for Public Land (2020). *The Heat is On*. https://www.tpl.org/sites/default/files/The-Heat-is-on_A-Trust-for-Public-Land_special-report.pdf
- Gallagher, J. (2010). Healing a Wounded Landscape. In *Reimagining Detroit: Opportunities for Redefining an American City*. Detroit, MI, U.S.A.: Wayne State University Press. (Chapter 5, pp. 85-96)
- Gallagher, J. (2010). Filling the Vacancy. In *Reimagining Detroit: Opportunities for Redefining an American City*. Detroit, MI, U.S.A.: Wayne State University Press. (Chapter 6, pp. 108-118)

Required Readings for Thursday, November 4:

- Team #2's Case Materials and Edge Notes
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Week 11: Introduction to Topic #3: Flows of Water & Case Presentation
Nov. 9 and Nov. 11

Goals/ Tasks/ Deliverables

- Discuss readings
- Team #3 presents its case study on an urban water flows topic
- Essay #1 due

Required Readings for Tuesday, November 9:

- Gandy, M. (2004). Rethinking urban metabolism: water, space and the modern city. *City*, 8(3), 363–379.
- McDonald, R. I., Weber, K., Padowski, J., Flörke, M., Schneider, C., Green, P. A., ... & Boucher, T. (2014). Water on an urban planet: Urbanization and the reach of urban water infrastructure. *Global Environmental Change*, 27, 96-105.

Required Readings for Thursday, November 11:

- Team #3's Case Materials and Edge Notes

Supplemental Reading Material (Optional):

Cousins, J.J., Newell, J.P. (2015). A political–industrial ecology of water supply infrastructure for Los Angeles. *Geoforum*, 58, 38–50

Week 12: Introduction to Topic #4: Buildings & Energy & Case Presentation
Nov. 16 and Nov. 18

Goals/ Tasks/ Deliverables

- Discuss readings
- Team #4 presents its case study on a buildings and energy topic

Required Readings for Tuesday, November 16:

- Ivanova, D., Stadler, K., Steen-Olsen, K., Wood, R., Vita, G., Tukker, A., & Hertwich, E. G. (2015). Environmental Impact Assessment of Household Consumption. *Journal of Industrial Ecology*, 20(3).
- Rees, W. E. (2009). The ecological crisis and self-delusion: implications for the building sector. *Building Research & Information*, 37(3), 300–311.
- Goldstein, B., Gounaridis, D., & Newell, J. P. (2020). The carbon footprint of household energy use in the United States. *Proceedings of the National Academy of Sciences*, 117(32), 19122-19130.

Required Readings for Thursday, November 18:

- Team #4's Case Materials and Edge Notes

Supplemental Reading Material (Optional):

- Winner, L. (1980). Do Artifacts Have Politics? *Daedalus*, vol. 109, no. 1, 1980, pp. 121–136. JSTOR, JSTOR, www.jstor.org/stable/20024652.
-

Week 13-14: Introduction to Topic #5: Flows of Waste & Case Presentation

Nov. 23 and Nov. 30

Goals/ Tasks/ Deliverables

- Discuss readings
- Team #5 presents its case study on an urban waste topic
- Essay #1 returned

Required Readings for Tuesday, November 23:

- Bengali, S. (2020, June 13). The COVID-19 pandemic is unleashing a tidal wave of plastic waste. *The Los Angeles Times*. <https://www.latimes.com/world-nation/story/2020-06-13/coronavirus-pandemic-plastic-waste-recycling>
- Guibrinet, L., Calvet, M. S., & Broto, V. C. (2017). Flows, system boundaries and the politics of urban metabolism: Waste management in Mexico City and Santiago de Chile. *Geoforum*, 85, 353-367.
- Kalina, M., & Tilley, E. (2020). “This is our next problem”: cleaning up from the covid-19 response. *Waste Management*.
- Love, B. J. & Rieland, J. (2020, June 23). COVID-19 is laying waste to many US recycling programs. *The Conversation*. <https://theconversation.com/covid-19-is-laying-waste-to-many-us-recycling-programs-1397>

Required Readings for Tuesday, November 30:

- Team #5’s Case Materials and Edge Notes
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- **NO CLASS on Thursday, November 25**
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Week 15: Introduction to Topic #6: Flows of Food & Case Presentation

Dec. 2 and Dec. 4

Goals/ Tasks/ Deliverables

- Discuss readings
- Team #6 presents its case study on an urban food topic

Required Readings for Thursday, December 2:

- Chamanara, S., Goldstein, B., & Newell, J. P. (2020). Where’s the beef? Costco’s meat supply chain and environmental justice in California. *Journal of Cleaner Production*, 278, 123744. <https://doi.org/10.1016/j.jclepro.2020.123744>

- Goldstein, B., Birkved, M., Fernández, J., & Hauschild, M. (2017). Surveying the environmental footprint of urban food consumption. *Journal of Industrial Ecology*, 21(1), 151-165.

Required Readings for Tuesday, December 7:

- Team #6's Case Materials and Edge Notes

Week 16: Synthesis and Moving Forward

Dec. 9

Goals/ Tasks/ Deliverables

- Discuss readings
- Policy and planning exercise
- **Essay #2 due Thursday, December 9**

Required Readings for Thursday, December 9:

- Cronon, W. (1992). *Nature's Metropolis: Chicago and the Great West*. WW Norton & Company. (Epilogue).
- Newell, J. P., & Cousins, J. J. (2014). The boundaries of urban metabolism: Towards a political – industrial ecology. *Progress in Human Geography*, 1–27
- Committee on Pathways to Urban Sustainability: Challenges and Opportunities; Science and Technology for Sustainability Program; Policy and Global Affairs; National Academies of Sciences, Engineering, and Medicine (2016). *Pathways to Urban Sustainability: Challenges and Opportunities for the United States*. The National Academies Press. Chapters 1, 2 and 5.