

Urban Sustainability
EAS 537: Syllabus
 University of Michigan
 Fall 2018

Tuesday and Thursday, 4:00pm-5:30pm, Dana 1046
 3 Credits

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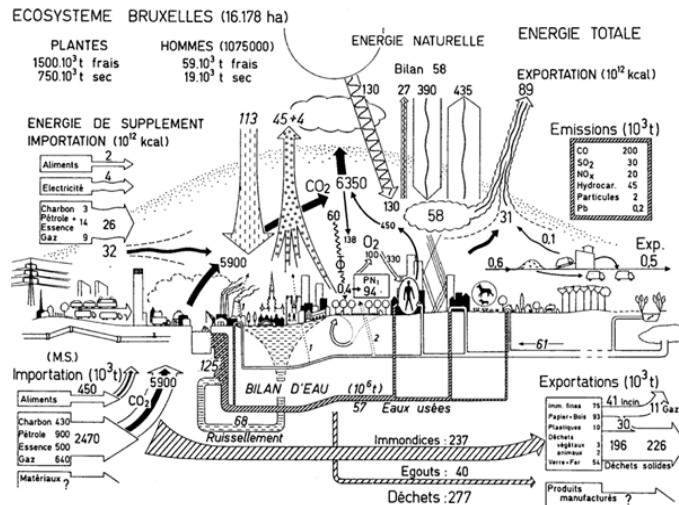
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**Urban Metabolism of Brussels, Duvigneaud and
 Denaeayer-De Smet (1977).**

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, and three writing responses. A field trip to Detroit and meetings with stakeholders also form 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.

Required Texts

You are required to purchase two books: 1) Cronon, W. (2009). *Nature's Metropolis: Chicago and the Great West*. WW Norton & Company; and 2) Schimel, J. (2012). *Writing Science: How to write papers that get cited and proposals that get funded*. Oxford University Press. These texts are in your local bookstore and can also be purchased on amazon.com or other internet bookseller. The remaining readings, both required and supplemental, are available in digital form on Canvas. I will provide ample notice of these minor changes in class and a revised syllabus will be posted electronically on Canvas. 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.

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 consisting of an optional field trip to Detroit and periodic in-class exercises. The primary deliverables, which are graded, are as follows: 1) Course participation; 2) three essay papers; 3) a midterm exam; 4) and a group case study project.

Course Participation

All students are expected to attend and participate in the scheduled class sessions. Unexcused absences will be reflected in final grades. Attendance will be taken ten times randomly during the semester, which forms part of your course grade. In order to participate fully, completing the required reading for each session is also essential.

Essay Papers

You are required to write three 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 three 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 Schmiel will form the 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 , September 25th; Essay #2, November 13th; Essay #3, December 11th. 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 an in-class midterm exam on October 11th. This exam covers the first portion of the course. There will not be any alternative date for this exam. As you make travel plans, please keep these dates in mind. 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'll 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:

Week 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, book, 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.

Week 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. This will be handed in at the end of the class.

Week 3: "Political Ecology and Urban Ecology Exercise" – Here you will take another group's MFA exercise and analyze it through urban political ecology and urban ecology lenses. 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 1-page document outlining your analysis.

Grading

Your course grade includes work completed as an individual and as a group. Your course grade will be based on a mid-term exam, three short essay papers, a group case study, and class participation as determined by attendance, by completion of in-class exercises, and by discussion of the course readings. 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	10%	Essay Papers (3)	30%
Case Material	10%	Mid-term Exam	20%
Case Presentation	10%	Attendance	10%
		In-class exercises	5%
		Discussion of reading	5%
Total	30%	Total	70%

Grades will be posted in the “Gradebook” tab in Canvas. Final grades are based on the total percentage received for the semester. Equivalent letter grades are as follows: A+ (98.50-100%), A (93.5-98.49%), A- (89.50–93.49%), B+ (87.50-89.49%), B (83.5-88.49%), B- (79.50–83.49%), C+ (77.50-79.49%), C (73.5-78.49%), and C- (69.50–73.49%).

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/>)

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>).

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>

Course Schedule and Plan At-A-Glance

Day	Topic	Readings	Activity	Key Deliverables
Module 1: Conceptual Foundations of Urban Sustainability				
Tues, Sept. 4	Introduction to Course	Cronon (2009) – Preface and Prologue; Ch 3 (Grain)	<ul style="list-style-type: none"> ● Discussion guidelines ● What is urban sustainability? (Mental maps) 	Think about your subject area interests
Thurs, Sept. 6	What is urban 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;
Tues, Sept. 11	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
Thurs, Sept. 13	Three ‘Ecologies’: Urban Political Ecology	Robbins (2004); Heynen et al (2006);	<ul style="list-style-type: none"> ● Discuss Readings ● PE and UE Exercise 	PE analysis of Sankey Diagram
Tues, Sept 18	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
Thurs, Sept. 20	Smart Cities/Indicators of Urban Sustainability	Townsend (2013) - Introduction Science for Environment Policy (2018); Schimel (2012), Ch. 4	<ul style="list-style-type: none"> ● Discuss readings ● Guest Lecture: TBD, Smart water management in the Detroit region. 	
Tues, Sept 25	Sustainability Practice: City of Detroit and City of New York	New York City, OneNYC 2018 Progress Report (available online) TBD	<ul style="list-style-type: none"> ● Guest Lecture: Joel Howrani, Director of Sustainability, City of Detroit and David Vega-Barachowitz, Senior Urban Designer, City of New York 	Essay #1 Due

Module #2: Nourishing the City, the 'Case' Approach, and Midterm

Thurs, Sept. 27	Topic #1: Nourishing the City	McClintock (2010); Gallagher (2010) – Ch 3; Seto and Ramankutty (2016)	<ul style="list-style-type: none"> ● Presentation of Sustainability Cases Project ● Discuss readings 	
Sat, Sep 29	Field Trip: Urban Agriculture in Detroit (Elective)	No required reading	<ul style="list-style-type: none"> ● Visit Michigan Urban Farming Initiative (MUFI) 	
Tues, Oct 2	Michigan Sustainability Case Initiative	Michigan Case Initiative Reading	<ul style="list-style-type: none"> ● Guest Lecture: Meghan Wagner, MSCI and Summer Aldred, Doris Duke Scholar ● Present Case 	
Thurs, Oct 4	Case Presentation #1: Urban Agriculture in Detroit	Case #1 Material	<ul style="list-style-type: none"> ● Case Activity 	
Tues, Oct 9	Midterm Exam Review	No required reading	<ul style="list-style-type: none"> ● Bring exam questions to class 	Essay #1 returned
Thurs, Oct 11	Midterm Exam	No required reading	<ul style="list-style-type: none"> ● Multiple choice and short answer exam 	MIDTERM
Tues, Oct 16	NO CLASS	No required reading		

Module #3: Form and Flows of the City, Theory and Case Studies

Thurs, Oct 18	In-Class Case Prep	Schimmel, Chapters 5 and 6 (Recommended)	<ul style="list-style-type: none"> ● Work in groups 	
Tues, Oct 23	In-Class Case Prep	No required reading	<ul style="list-style-type: none"> ● Work in groups 	Midterm Exam Returned Case Summary Due
Thurs, Oct 25	In-Class Case Prep	No required reading	<ul style="list-style-type: none"> ● Work in groups 	
Tues, Oct 30	Topic #2 Urban Green Space	Wolch et al. (2014); Heynen et al. (2006); Gallagher (2010) - Ch 5, Ch 6	<ul style="list-style-type: none"> ● Team #2 introduces case 	
Thurs, Nov 1	Case Presentation #2 Urban Green Space	Case #2 Material	<ul style="list-style-type: none"> ● Student-led case activity 	
Tues, Nov 6	Topic #3 Flows of Water	Gandy (2004); Hoff et al. (2014)	<ul style="list-style-type: none"> ● Discuss readings ● Team #3 introduces case 	

Thurs, Nov 8	Case Presentation #3 Flows of Water	Case #3 Material	<ul style="list-style-type: none"> • Student-led case activity 	
Tues, Nov 13	Topic #4 Buildings and Energy	Ivanova et al. (2016) Rees (2009); Kennedy (2015)	<ul style="list-style-type: none"> • Discuss readings • Team #4 introduces case 	Essay #2 Due
Thurs, Nov 15	Case Presentation #4 Buildings and Energy	Case #4 Material	<ul style="list-style-type: none"> • Student-led case activity 	
Tues, Nov 20	NO CLASS	No required reading	<ul style="list-style-type: none"> • 	
Thurs, Nov 22	Topic #5 Transportation and Urban Form	Fishman (2015); Gallagher (2010), Ch 4; Gillham (2002)	<ul style="list-style-type: none"> • Discuss readings • Team #5 introduces case 	
Tues, Nov 27	Case Presentation #5 Transportation and Urban Form	Case #4 Material	<ul style="list-style-type: none"> • Student-led case activity 	Essay #2 Returned
Thurs, Nov 29	Topic #6 Flows of Waste	Ellen MacArthur Foundation (2017) Marvin (2006)	<ul style="list-style-type: none"> • Discuss readings • Team #6 introduces case 	
Tues, Dec 4	Case Presentation #6 Flows of Waste	Case #6 Material	<ul style="list-style-type: none"> • Student-led case activity 	
Module #4: Synthesis and Moving Forward				
Thurs, Dec 6	Towards Synthesis: In the Academy	Cronon (1992), Epilogue; Broto et al (2012); Newell and Cousins (2014)	<ul style="list-style-type: none"> • Mental Maps Revisited 	
Tues, Dec 11	Synthesis and Policy: Next Steps	National Academy of Sciences (2016), Ch. 1, 2 and 5	<ul style="list-style-type: none"> • Policy and Planning Exercise 	Essay #3 Due

READING LIST

(Note: this list may change slightly over the term. I will give you ample advance notice should such changes occur)

Week 1: What is Urban Sustainability?

Sept. 4 and Sept. 6

Goals/ Tasks/ Deliverables

- Explore research interests, “What is urban sustainability?”
- Discuss readings

Required for Tuesday, September 4:

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).

Required for Thursday, September 6:

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.

Supplemental Reading Material (Optional)

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.

McGranahan, G., & Satterthwaite, D. (2003). Urban centers: An assessment of sustainability. *Annual Review of Environment and Resources*, 28(1), pp. 243-274.

Week 2: “The Three Ecologies:” Industrial Ecology, Urban Metabolism, and Political Ecology

Sept. 11 and Sept. 13

Goals/ Tasks/ Deliverables

- Understand and practice Material Flow Analysis (MFA); turn in worksheet
- Discuss readings

Required for Tuesday, September 11:

- 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.

Required for Thursday, September 13:

- 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.

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.
- 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., Bauen, 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.

Week 3: Urban Ecology and Interdisciplinary Prospects
Sept. 18 and Sept. 20Goals/ Tasks/ Deliverables

- PE and UE Exercise
- Understand and critique urban sustainability indicators
- Discuss Readings

Required for Tuesday, September 18:

- 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.

Schmiel, J. (2012). *Writing Science*. Chapter 2, pp. 8-15. Oxford, United Kingdom and New York, New York, U.S.A.: Oxford University Press.

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

Required for Thursday, September 20:

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*.

Schmiel, J. (2012). *Writing Science*. Chapter 4, pp. 26-34. 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.

Week 4, Sept. 25 *Indicators of Urban Sustainability in Practice (in Detroit & New York)*

Goals/ Tasks/ Deliverables

- Discuss Readings
- **Essay #1 due Tuesday, September 25**

Required Readings for Tuesday, September 25:

City of New York. (2018). *OneNYC 2018, Progress Report*. Retrieved from onenyc.cityofnewyork.us/plan/ on August 27, 2018

TBD

Week 4, Sept. 27 **Nourishing the City and the “Case” Approach**

Goals/ Tasks/ Deliverables

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

Required Readings for Thursday, September 29:

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.

Week 5 **Urban Agriculture in Detroit**

Oct. 2 and Oct. 4

Goals/ Tasks/ Deliverables

- Discuss Readings
- **Optional field trip to MUFI in Detroit: Saturday, September 29**

Required Reading for Tuesday, October 2:

Michigan Case Initiative Reading

Required Reading for Thursday, October 4:

Urban Agriculture in Detroit

Week 6 **Midterm Exam (Review and Test)**

Oct. 9 and Oct. 11

Goals/ Tasks/ Deliverables

- Prepare for the midterm on Tuesday, Oct. 9
 - Take the midterm exam on Thursday, Oct. 11
 - Essay #1 returned
-

Week 7 **In-Class Preparation of Case Studies**

Oct. 18

Goals/ Tasks/ Deliverables

- **NO CLASS on Tuesday, October 16**
- Work in groups preparing case studies on Thursday, October 18

Supplemental Reading Material (Optional):

Schmiel, J. (2012). *Writing Science*. Chapter 5, pp. 35-49. Oxford, United Kingdom and New York, New York, U.S.A.: Oxford University Press.

Schmiel, J. (2012). *Writing Science*. Chapter 6, pp. 50-57. Oxford, United Kingdom and New York, New York, U.S.A.: Oxford University Press.

Week 8 ***In-Class Preparation of Case Studies***
Oct. 23 and Oct. 25

Goals/ Tasks/ Deliverables

- Work in groups preparing case studies
 - Midterm exam returned
 - **Case Summary due Tuesday, October 25**
-

Week 9 ***Topic #2 Urban Green Space***
Oct. 30 and Nov. 1

Goals/ Tasks/ Deliverables

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

Required Readings for Tuesday, November 1:

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.

Heynen, N. C., Perkins, H. A., & Parama, R. (2006). The political ecology of uneven urban green space: The impact of political economy on race and ethnicity in producing environmental inequality in Milwaukee. *Urban Affairs Review*, 42(1), 3–25.

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. 97-118)

Required Readings for Thursday, November 1: Team #2’s Case Materials and Edge Notes

Week 10 **Topic #3: Flows of Water**

Nov. 6 and Nov. 8

Goals/ Tasks/ Deliverables

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

Required Readings for Tuesday, November 6:

Gandy, M. (2004). Rethinking urban metabolism: water, space and the modern city. *City*, 8(3), 363–379.
Hoff, H., Döll, P., Fader, M., Gerten, D., Hauser, S., & Siebert, S. (2014). Water footprints of cities - indicators for sustainable consumption and production. *Hydrology and Earth System Sciences*, 18(1), 213–226.

Required Readings for Thursday, November 8: Team #3's Case Materials and Edge Notes

Supplementary Reading:

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

Week 11 **Topic #4: Buildings and Energy**

Nov. 13 and Nov. 15

Goals/ Tasks/ Deliverables

- Discuss readings
- Team #4 presents its case study on a buildings and energy topic
- **Essay #2 due Tuesday, November 15**

Required Readings for Tuesday, November 15:

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.
Kennedy, C. A. et al. (2015). Energy and material flows of megacities. *Pnas*, 112(19), 5985-5990.

Required Readings for Thursday, November 15: Team #4's Case Materials and Edge Notes

Week 12, Nov. 22 **Topic #5: Transportation and Urban Form (Introduction)**

Goals/ Tasks/ Deliverables

- Discuss readings

- **NO CLASS on Tuesday, November 20**

Required Readings for Tuesday, November 22:

- Fishman, R. (2015). Detroit: Linear City. In Mapping Detroit; Land, Community, and Shaping in a City (pp. 77–99). Wayne State University Press.
- 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. 3–23). Washington, D.C., U.S.A.: Island Press and The Center for Resource Economics.

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, Nov. 29 Topic #5: Transportation and Urban Form (Case Presentation)

Goals/ Tasks/ Deliverables

- Team #5 presents its case study on a transportation and urban form topic
- Essay #2 returned

Required Readings for Tuesday, November 22: Team #5’s Case Materials and Edge Notes

Week 13, Nov. 29 Topic #6: Flows of Waste (Introduction)

Goals/ Tasks/ Deliverables

- Discuss readings

Required Readings for Thursday, November 29:

- Ellen Macarthur Foundation (2017). Cities in the circular economy: an initial exploration.
- Marvin, S., & Medd, W. (2006). Metabolisms of obesity: flows of fat through bodies, cities, and sewers. *Environment and Planning A*, 38(2), 313 – 324.
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Week 14, Dec. 4 Topic #6: Flows of Waste (Case Presentation)

Goals/ Tasks/ Deliverables

- Team #6 presents its case study on an urban waste topic

Required Readings for Tuesday, December 4: Team #6’s Case Materials and Edge Notes

Dec. 6 and 11 Synthesis and Moving Forward

Goals/ Tasks/ Deliverables

- Discuss readings
- **Essay #3 due Tuesday, December 11**

Required Readings for Thursday, December 6:

Cronon, W. (1992). Nature's Metropolis: Chicago and the Great West. WW Norton & Company. (Epilogue).

Broto, V. C., Allen, A., & Rapoport, E. (2012). Interdisciplinary Perspectives on Urban Metabolism. *Journal of Industrial Ecology*, 16(6), 851–861.

Newell, J. P., & Cousins, J. J. (2014). The boundaries of urban metabolism: Towards a political – industrial ecology. *Progress in Human Geography*, 1–27.

Required Readings for Tuesday, December 11: TBD

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