

# Creating the Sustainable City: Building a Seminar (and Curriculum) through Interdisciplinary Learning

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## Abstract

*Using the wealth of sites available in the Chicago metropolitan area, online learning technologies, and classroom interactions, Roosevelt University's seminar "The Sustainable City" takes a multidisciplinary approach to urban ecology, waste management, green design, climate change, urban planning, parklands, water systems, environmental justice, ecological restoration, and urban agriculture. The seminar introduces adult undergraduates to the study of the Chicago metropolitan area's natural and social environment through field trips, Blackboard-based online discussions, and team-taught lectures and in-class discussions. Most significantly, the seminar has inspired a new curriculum in sustainability studies at Roosevelt.*

Roosevelt University, a private institution with campuses in downtown Chicago and the northwest suburbs, is in the process of developing more sustainable practices. The university is presently upgrading its physical infrastructure to include a downtown skyscraper that seeks to conserve energy and water. In addition, it has taken steps to green its curriculum. In fall 2008, Roosevelt asked two of its faculty in the Professional and Liberal Studies department to develop a course that would investigate the sustainability of the urban environment. This article discusses the resulting seminar, Professional and Liberal Studies (PLS) \ 394 "The Sustainable City," introduced in spring 2009, and the subsequent development of an academic program based on the themes and pedagogy of that seminar. Team-taught by Carl Zimring and Michael Bryson, colleagues with backgrounds in environmental history, environmental literature, and urban ecology, the seminar explored the myriad environmental, social, and scientific dimensions of sustainability in urban regions. Using the Chicago metropolitan area as a learning laboratory, the course took a multidisciplinary approach to urban ecology, waste management, green design, climate change, urban planning, parklands, water systems, environmental justice, ecological restoration, and urban agriculture. Its first iteration introduced Roosevelt University adult undergraduates (most of whom had no background in science or environmental studies) to the study of the Chicago metropolitan area's natural and social environment (Biemiller 2009).

One notable aspect of the seminar was its mix of technological, traditional, and field-based learning experiences, which might well be summarized by the phrase "from Blackboard to Bubbly Creek." Our article discusses the ways in which the course

combined Blackboard-based interaction; online resources ranging from films about urban agriculture to maps of the Chicago area's wetlands; traditional in-class lecture and discussion; and several field trip experiences, which culminated in a guided canoe trip down Bubbly Creek, an industrialized tributary of the Chicago River on the city's Southwest Side.

In addition, we evaluate the advantages of team-teaching for fostering an interdisciplinary approach to urban sustainability, and discuss how the seminar planted the seeds for a new Sustainability Studies initiative here at Roosevelt, a quintessential metropolitan university. "The Sustainable City" exemplified how the analytic methods of the social and natural sciences can be integrated to shed light on issues related to urban sustainability. Topics such as environmental history and urban ecology, sustainable development and landscape transformations, recycling and waste management, and ecosystem restoration are best examined not in isolation from one another, but in combination and through the lenses of history, policymaking, biology, and ecology. In this sense, the seminar served as an incubator for ideas about how the theme of sustainability not only can enrich the undergraduate general education experience, but also can inspire curriculum initiatives for new academic programs, provide opportunities for service learning, and connect city and suburban students to local environmental concerns within the urban landscape.

## **Roosevelt University: A Snapshot**

Roosevelt University was founded in 1945 in downtown Chicago with a mission to apply the values of Franklin and Eleanor Roosevelt to a liberal arts education for all, regardless of race or gender. The university's commitment to social justice is deeply rooted in its history and is reflected in both its mission and strategic plan (Roosevelt University 2008). As Roosevelt seeks to apply a distinctive metropolitan focus to its curriculum, designing courses on the urban environment is particularly appropriate to the needs and mission of the school.

Within Roosevelt, the Evelyn T. Stone College of Professional Studies has a broad student base of all ages. An important focus of the college is the degree in Professional and Liberal Studies, in which adults 24 years of age and older may pursue a fast-track bachelor's degree in a variety of majors complemented by an interdisciplinary general education curriculum that is rooted in the liberal arts. The program offers evening courses both in downtown Chicago and at the school's northwest suburban campus in Schaumburg, as well as online courses to enhance flexible scheduling for students working full-time, raising families, or balancing other commitments.

## **Defining Urban Sustainability**

Urban sustainability encompasses many factors. The overriding goal of sustainability is to establish a way of living, of conducting business, and of protecting environments from the local to the global in such a way that will benefit future generations as well as the natural environment. Meeting this goal requires approaches that utilize the natural

sciences, social sciences, policy, and creative thought. Within such a context, the city is viewed as an integrated series of systems that use and manage energy, water, goods, services, and wastes; a sustainable system approach does so without depleting resources or otherwise damaging the environment. Developing sustainable systems is especially important as urban areas around the world are expanding, creating larger sinks of energy from domestic, transportation, and industrial requirements; larger volumes of post-consumer wastes; and greater stresses on existing parks, watersheds, and waterways. Urban sustainability properly conceived must address a variety of environmental and social issues, ideally resulting in improved conditions for urban residents in the long-term and maintaining biodiversity in regions with millions of humans coexisting with other forms of life (Douglass and Zoghlin 1994; Drakakis-Smith 1995; Sachs 1993).

## **Planning “The Sustainable City”**

We enjoyed an embarrassment of riches regarding possible themes and opportunities for an urban sustainability course in Chicago. One question was that of disciplinary focus: because so many social and natural sciences are relevant to the study of urban sustainability, what balance of disciplinary methods would be appropriate? One approach to defining the course was to draw upon the established expertise of the two instructors. Michael Bryson was already a veteran teacher in the program, helming several sections of the Seminar in Natural Science as well as being an accomplished scholar on popular science and nature writing. Both his research and teaching strive to integrate the humanities and natural sciences in the study of the natural environment, particularly that in urban systems. Carl Zimring came to Roosevelt in 2008 after several years of teaching interdisciplinary environmental studies courses at Oberlin College. Among the approaches he had taught previously were history (his home discipline), anthropology, sociology, economics, and policy analysis. Our existing expertise, therefore, allowed us to begin defining parameters for a potentially broad interdisciplinary course.

A second dilemma had to do with the case studies explored. In a metropolitan area with so many examples of functioning and non-functioning systems, what cases were most vital to this course, and to what extent should we focus on them? The latter question would loom large; in actually teaching the course, we realized that our one-week unit on water, for example, could easily be expanded to be a course in its own right. An important part of the process, then, was articulating the cases we wished to explore, and then prioritizing them within the schedule. After discussion throughout fall 2008, key critical themes emerged, including biodiversity, climate change, water, energy, and waste management. Other crosscutting themes, such as social and environmental justice, were both addressed directly in separate weekly units as well as investigated implicitly throughout the semester within the context of specific case studies.

Third, since the course was designed as a hybrid of in-class meetings, field trips, and online discussion, we needed to determine what materials would be presented in each of those formats—and how the formats might be integrated. Prosaic issues included

the number of field trips we should offer (and once that number was established, on which topics, and during which parts of a semester held from February to May in Chicago); how much time students should spend online in a hybrid six-credit-hour course; what kind of online interaction would be most beneficial for students and instructors alike; and what share of the in-class meetings should be devoted to lecture or discussion.

In organizing the syllabus for the course, we decided that scheduling the field trips was our top priority. These meetings required the most advanced planning, yet also provided the additional benefit of locking in times in the schedule to focus on particular themes. This decision necessitated a modular set of readings, allowing us to narrow down the type of textbook and additional readings we would offer. To a large extent, then, the shape and structure of our syllabus was created through planning the field trips during fall 2008.

We then selected a textbook, the second edition of *The Sustainable Urban Development Reader* (Wheeler and Beatley 2009). Aside from being brand-new, the text was broken up into modules and was broadly interdisciplinary, ranging from checklists of LEED certification for buildings to explorations of the science and politics of ecological restoration to science fiction ruminations on the ideal community. We subsequently added a wealth of short readings and websites to augment the main text.

The weekly rhythm of the class involved conducting lectures and leading seminar-style discussions among our twenty-four students each Tuesday evening on campus, then posting a series of discussion questions to stimulate online dialogue in Blackboard the rest of the week. As instructors, we collaborated on every facet of the teaching process, whether presenting complementary mini-lectures in our Tuesday sessions or developing the online discussion questions for the rest of the week. Field trips were usually held on occasional Saturdays; students were required to attend at least two and write up reflection pieces on each experience that also incorporated relevant course readings. Students also developed a relevant research project that was produced in stages over the course of the semester, ideally incorporating themes from the readings and field trips in addition to outside research (Bryson and Zimring 2009c).

## **From Blackboard to Bubbly Creek**

“The Sustainable City” extended beyond the classroom in downtown Chicago to regular activities in cyberspace and the metropolitan area. Using technology to support course activities as well as frequent field trips represented two key components of the course.

### **Using Technology**

The seminar was technology-intensive in every respect, a logical result of its hybrid format. All course materials—from the basic syllabus to an extensive bibliography of print and online resources to detailed research guides—were accessible both from our Blackboard site (an online learning portal used by Roosevelt and hundreds of other

universities worldwide) as well as the freestanding course website (Bryson and Zimring 2009a). Videos, interactive maps, virtual building tours, and other multimedia sources complemented our traditional print-based readings and figured prominently in our many PowerPoint presentations for on-campus class sessions.

While this reliance upon technology and the hybrid format provided tremendous convenience to students in many ways (including cutting their commuting time and transportation energy usage in half!), it also was challenging to a handful of students who felt initially intimidated by the Blackboard-based requirements. To address this, we built a Blackboard orientation into our initial class session and provided as much individualized help as students requested—something made easier by team-teaching, to say the least.

One noteworthy integration of technology into the seminar was the Library Resource Paper, which required students to identify, cite, and briefly annotate several sources relating to a topic of their choosing in specific RU catalogs, databases, and other resources (Bryson and Zimring 2009b). This assignment was supported by our embedded librarian, Jennifer Lau-Bond, who also developed a customized “LibGuide” library resource page for our seminar. The assignment emphasized the use of peer-reviewed sources as a corrective to Google-limited research, and helped generate topic choices and working bibliographies for students’ forthcoming research projects.

## **Taking Field Trips**

In addition to our regular forays into cyberspace, we also ventured out into Chicago’s neighborhoods and hinterlands for field studies. The Chicago area is rich with potential field trip opportunities. The course’s field trips not only were diverting and instructive breaks in the weekly rhythm of the course, but also were carefully integrated with the seminar’s schedule and written assignments. A brief description of the five trips illuminates the variety of disciplinary approaches and themes in the course.

During the second week of the semester, students had a choice of seeing a Van Jones lecture at the Museum of Science and Industry or participating in the Chicago Wilderness-sponsored “Wild Things” conference at the University of Illinois at Chicago. Jones highlighted the central role economics and job creation has in efforts to forge a more sustainable and just society, through his linkage of the “green economy” and environmental justice. Jones’ emphasis on linking environmental development to economic justice in the inner cities inspired our students (most of whom in attendance were African Americans living in the city). His discussion of how green jobs could benefit neglected areas became a running theme among several students, and served as the course’s introduction to environmental justice concepts. The “Wild Things” conference introduced students to a wide range of sustainability, urban ecology, and conservation topics (e.g., biodiversity, water conservation, and ecosystem restoration) that anticipated upcoming weekly themes and inspired possible research topics. Students also witnessed how academic study of these issues can be integrated fruitfully

with grassroots activism, public education, and civic engagement in local environmental issues while participating in this biannual Chicago event.

We next took students to Chicago's West Side, where the city operates the Chicago Center for Green Technology. Located close to public transportation, the center boasts examples of sustainable architecture, gardening, and the use of household technologies such as CFL light bulbs. Students were able to tour both the main facility, an LEED-certified structure that demonstrates a variety of energy-saving and material-reuse design features, and an energy-conserving house designed by students at the University of Illinois. This field trip underscored the various kinds of connections between environmental science, technology, and design, and framed these connections within a vision of environmental ethics and progressive public policy necessary to fostering urban sustainability throughout the cityscape.

Further afield, we trekked north of the city to two diverse landscapes in Lake County, one of the Chicago region's fast-urbanizing collar counties. One was the Waste Management facility in Grayslake, where students learned how recyclables are sorted and sold into industrial production. The facility tour showed students which post-consumer materials were suitable for recycling and how post-consumer commodity markets function. Students also learned about the political economy of recycling, as the workers handling the (often dangerous) materials on the line were predominately Hispanic, a pattern prevalent in the industry. Our subsequent discussion centered on how consumption and waste management systems might be more efficient and reduce environmental inequalities.

A second trip involved exploring the wetlands reclamation going on at the Des Plaines River Wetlands Demonstration Project (DPRWDP) in Wadsworth, Illinois. At this sprawling site managed by Wetlands Research, Inc., along the upper Des Plaines floodplain, students hiked through a series of constructed and restored wetlands and learned about the hydrology and diverse wildlife contained therein. As land that is integrated within the Lake County Forest Preserve, the DPRWDP demonstrates that the restoration of riverine wetlands is not only an important example of open space conservation efforts between public and private partners, but also vital to improving flood control in the upper Des Plaines watershed as well as increasing habitat for wetland plants and animals.

Our final trip, a canoe journey down Bubbly Creek led by the organization Friends of the Chicago River, brought to life the challenges and opportunities of restoring vitality to a long-abused and infamous waterway (Upton Sinclair identified it as a "great open sewer" for Chicago's slaughterhouses a century ago) in the context of a fun and unique urban outdoor adventure (Sinclair 1906). This trip took full advantages of Chicago's distinctive urban site—as William Cronon demonstrated, its proximity to lakes, rivers, and rails allowed Chicago to take in raw materials from vast hinterlands and produce commodities, great wealth, and immense amounts of pollution. Nowhere was this more evident than in the epicenter of the nation's meatpacking industry, where wastes were

dumped into the small tributary off the South Fork of the Chicago River. With the close of the slaughterhouses, Bubbly Creek then became a depository for Chicago's sewage. Methane from decomposing organic matter continues to bubble up from the murky brown water.

Partnering with Friends gave us access to the group's canoes and equipment, but also provided us with experienced guides who imparted knowledge about the waterway's natural and cultural history. The organization had not offered canoe trips of Bubbly Creek for a decade, meaning this field trip was a pioneering effort for all concerned. Students took an intimate and leisurely journey down a waterway that had been utterly transformed for industrial use (concrete and metal channeled the river) —and one where reclamation efforts of the riverside had begun on a modest scale. The Bubbly Creek field trip was thus a fitting capstone to a course uniquely poised to take advantage of the extraordinary learning tool that is Chicago's environmental heritage.

#### Sustainability, Interdisciplinary Teaching, and General Education

"The Sustainable City" exemplified how the analytic methods of the social and natural sciences could be integrated to shed light on issues related to urban sustainability. Topics such as environmental history and urban ecology, sustainable development and landscape transformations, recycling and waste management, and ecosystem restoration are best examined not in isolation from one another, but in combination and through the lenses of history, policymaking, biology, and ecology.

This approach influenced every aspect of the seminar's design, including the team-teaching format, the selection of weekly reading/discussion topics, the choice of field trips, and the various writing assignments. One pedagogical challenge, in particular—the fact that students would be taking the course for either social science or natural science credit within their general education sequence—turned into an opportunity for us to develop new online materials to guide students through the entire research process, from selecting a topic to crafting a proposal to writing a research paper (Bryson and Zimring 2009c). In this way, we worked from a common set of interdisciplinary readings while tailoring each student's experience for a natural science or social science emphasis.

The initial research proposal was a two-page document due Week Six in which students provided us with concrete information on the scope and organization of their topics. At the same time, it initiated a dialogue in which students speculated on what avenues of inquiry they might explore, allowing for early feedback as they built a foundation for their research.

In Week Ten, students then handed in a polished 10- to 12-page draft of their research papers, attempting to produce as finished a project as possible. Each student handed in this draft as a hard copy in a folder that also included a set of photocopies of key source pages from which the student paraphrased information from two or three separate sources, with relevant passages highlighted in both the paper and the source

material. Each student also had to include in the folder a copy of the initial proposal with instructor's comments.

At the end of the semester, students had feedback during the Research Proposal phase and First Draft phase that they could use to revise for the Final Draft of their individualized research papers. By this point in the semester, students already had been expected to develop properly cited bibliographies and develop arguments based on a wide variety of primary sources. What resulted were papers that drew on both natural science and social science sources and methodologies, while emphasizing one or the other.

The document we produced for the development of a social science-based urban sustainability research project illustrates this interdisciplinary approach, particularly in the following section on topic selection:

One issue which is primarily a social science topic is that of **environmental justice** (Week 10). As with many social justice issues, environmental justice has a sociological component (who is affected by environmental inequities, and how does that relate to issues of race/class/gender?). It has an ethical/philosophical component, as matters of environmental justice demand that we consider what is ethical treatment not just of our fellow humans, but of the ecosystems we inhabit. Economics plays a role, too, as environmental injustice primarily impacts poor communities, especially in urban areas; and environmental remediation and legal recourse requires significant funding to occur. Finally, one could trace the history of environmental justice (whether in terms of on-the-ground projects, political movements, or both) in a particular city or community.

Yet other topics not obviously rooted in the social sciences also raise potential historical, economic, and/or sociological issues and questions. Consider the issue of **climate change and cities** (Week 5). Certainly, knowledge of climate science (meteorology and ecology) is needed to understand the processes through which global warming occurs, and technological developments are needed to generate power, manage waste, provide transportation, etc. all while cutting carbon emissions. However, political action and public policy are important considerations in galvanizing public/government support for climate change initiatives in cities, not to mention the country as a whole. Consequently, even an ostensibly scientific/technical issue such as climate change has significant political and historical elements. (Bryson and Zimring 2009d)

A similar approach was taken to helping students articulate and develop natural science-based research topics, with the net result being that students recognized that many possible topics could be profitably addressed by either a social or natural science perspective (or both simultaneously, as a few students attempted to do).

## **Sustainability Studies: Greening the Curriculum at Roosevelt**

Finally, and most significantly, our "Sustainable City" seminar served as an incubator for ideas about how the theme of sustainability could inspire curriculum initiatives in urban environmental studies, provide opportunities for service learning, and connect city and suburban students to local environmental concerns within the urban landscape. In the short term, future iterations of the course can integrate service-learning experiences, especially given the centrality of environmental justice to the seminar's topics and overall spirit. This could involve, for example, providing research and/or manual labor for urban farming operations, a project being pioneered by one of our colleagues in the College of Professional Studies.

Student response to the course theme of sustainability was overwhelmingly positive. Regardless of age, race, or gender in that diverse group of adult learners, students expressed a hunger for more education in the urban environment. All of the field trips were met with great enthusiasm, and although we required students to attend only two trips, several attended four or five. One student went so far as to write (unprompted) a letter to the dean of the college requesting more courses on sustainability, stating that such a program would be "a gem in Roosevelt's crown." In short, student response to this challenging experience exceeded our already high hopes and expectations.

With the course completed and favorably evaluated by its students, we subsequently developed a "Sustainability Studies" program in Roosevelt's College of Professional Studies that focuses on the urban environment. This groundbreaking initiative aligns with the increased prominence of sustainability in institutions of higher education, which not only are aiming to make their campus operations more ecologically sound but also are integrating sustainability throughout the college curriculum in a variety of ways (Webster and Dautremont-Smith 2009). From this initial course, we designed a curriculum of ten courses for an undergraduate major, including an introductory course entitled "The Sustainable Future," interdisciplinary seminars on specific themes ("Water"; "Food"; "Waste"; "Energy and Climate Change"; "Sprawl, Transportation, and Planning"; "Biodiversity"; "Policy, Law, and Ethics") and options for service-learning experiences and seminars on special topics. We also designed the curriculum so that the College of Professional Studies' existing majors in Hospitality, Organizational Leadership, and other programs could establish a concentration or second major in Sustainability Studies with reasonable ease.

The program proposal evolved fairly quickly. Upon the conclusion of the seminar in May 2009, we (along with Professional and Liberal Studies chair D. Bradford Hunt) developed the proposal for the program over summer 2009. Between September and December 2009, the proposal was discussed and approved in four separate stages, which culminated in final review and approval by the university's Undergraduate Council (which oversees all undergraduate programs throughout the university) in

December 2009. The first offering of “The Sustainable Future” is scheduled for spring 2010, with two courses scheduled for fall 2010.

Faculty were excited about the interdisciplinary dimensions of the program at most stages of the approval process. In many U.S. colleges and universities, Environmental Studies undergraduate majors are cobbled together from courses in social and natural science departments, and students choose from among a wide range of prerequisite-heavy electives. Consequently, the curricula often are fractured and offer few interdisciplinary courses (usually an introductory Environmental Studies course and/or a capstone course). Similarly, most Environmental Science degrees combine a modicum of social science with introductory and advanced hard science courses; these degrees are largely aimed at training students for fieldwork in technical environmental science careers (e.g., water quality technician). In both cases, merely a token course or two often represents the humanities.

Our planned sustainability-focused curriculum, by contrast, is strongly interdisciplinary, thematic, and coherent, offering specific courses focused on current sustainability issues, such as water, energy, transportation, food, waste, economic development, sprawl, and biodiversity. Issues of environmental and social justice are addressed throughout the curriculum, often in the form of case studies. These important social and legal issues will be explored with a special emphasis in the “Policy, Law, and Ethics” course, as well as in selected service-learning opportunities within the community. Each seminar will expose students to field trip experiences within the Chicago region, connecting students to the community, reinforcing classroom-based learning, and taking advantage of our focus on making urban systems more sustainable.

At the final stage of the approval process, some faculty were concerned about the natural science component of the major. Our curriculum seeks to provide critical information and conceptual literacy for non-scientists about the scientific method, as well as issues and controversies in environmental science. Students desiring more advanced training in science can minor in biology, environmental science, chemistry, or geographic information systems, all of which are ideal complements to the Sustainability curriculum.

Building upon the themes we developed in “The Sustainable City,” the Sustainability curriculum uses an interdisciplinary approach to enhance students’ critical thinking, writing, and research skills. At a time when Roosevelt University seeks to build a 32-story LEED-certified skyscraper to house students and academic programs in downtown Chicago, this program will help position Roosevelt University as a leader on issues of sustainability, which is developing into the social justice issue of the 21st century, by greening the undergraduate curriculum and introducing nontraditional and minority students to the field of environmental studies within a relevant and exciting context. We anticipate that the program will attract new students to Roosevelt who are interested in the pressing issues of environmental problem solving in the years to come (Biemiller 2009).

## Conclusion

In sum, our spring 2009 experimental seminar “The Sustainable City” was a fruitful testing ground for interdisciplinary team-teaching as well as the seed for a cutting-edge program in keeping with Roosevelt University’s history and mission as a metropolitan university that strives to connect the academy with the larger community. It is our hope that Roosevelt’s foray into the emerging field of Sustainability Studies eventually may serve as a model for other city and suburban universities in developing successful environmental education programs.

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