Sustainability and Graduate Business Education: An Analysis of the Need, Best Efforts to Date, and Curriculum Recommendations

Author: Marnie L. Abramson

Abstract: This paper examines the current state of green education by identifying the top graduate business programs that offer high quality education, relevant coursework, and sustainable campus-wide operations. The paper brings to light a strong need for more comprehensive and integrated coursework within the core curriculum of our nation's top programs. The paper provides the opportunity for enhanced thought leadership by introducing a series of four classes that represent a cross-section of the most important concepts of sustainability.

Business, Education, and Sustainability

This paper is an examination of graduate business schools and the institutions that house them as a means of opening a conversation on what an integrated, systems-based, sustainable business education should look like. In order to provide a framework for discussion, three well-established, public sources were selected to examine the following: (1) business schools that were pre-determined to offer students a top quality education; (2) business schools that offer access to coursework and faculty producing research on sustainability; and (3) universities that rank highly in terms of sustainable campus-wide operations, as a means of providing proof of concept and an experiential, hands-on opportunity to compliment the theory of traditional coursework. These sources were combined using a weighted average (equal distribution) to produce a list of 14 programs that are at least attempting to take a systems-wide approach to sustainability, and have the market credibility to promote these practices.

Sources of Information

The first source is the 2009 Bloomberg Businessweek’s Business School Rankings and Profiles.¹ This well-respected and often-cited source uses 12 criteria to determine the final ranking of the top MBA programs on an annual basis. Detailed responses to each of these criteria, as well as the Top 30 business schools, and a partial list of second-tier schools, can be found in Exhibit 1.

The second source is the Global 100: Preparing MBAs for Social and Environmental Stewardship² published by the Aspen Institute, which examines the
### Exhibit 1 | 2009 Businessweek Rankings of Top MBA Programs

| Rank | School               | Grad Poll | Corp Poll | Intel Cap | Tuition & Fees | Pre-MBA $(000) | Post-MBA $(000) | Selectivity | Job Offers | Gen Mgmt | Analysis | Teaching | Careers |
|------|----------------------|-----------|-----------|-----------|---------------|----------------|----------------|--------------|------------|-----------|----------|----------|----------|---------|
| 1    | Chicago (Booth)      | 1         | 2         | 6         | 97,165        | 78.0           | 105.0          | 22           | 94.8       | A+        | A+       | A+       | A+       |
| 2    | Harvard              | 4         | 4         | 9         | 101,660       | 77.0           | 121.0          | 12           | 100.0      | A+        | A+       | A        | A+       |
| 3    | Northwestern (Kellogg) | 6         | 1         | 25        | 93,918        | 75.0           | 110.0          | 20           | 97.0       | A+        | A+       | B        | A+       |
| 4    | Pennsylvania (Wharton) | 3         | 5         | 11        | 100,860       | 80.0           | 120.0          | 18           | 95.6       | A+        | A+       | B        | A+       |
| 5    | Michigan (Ross)      | 10        | 3         | 12        | 90,879        | 63.5           | 105.0          | 20           | 95.9       | A+        | A        | B        | A        |
| 6    | Stanford             | 2         | 9         | 2         | 97,842        | 75.0           | 125.0          | 8            | 96.7       | A+        | A+       | B        | A+       |
| 7    | Columbia             | 7         | 6         | 8         | 94,104        | 75.0           | 110.0          | 15           | 94.2       | A+        | A        | A        | A+       |
| 8    | Duke (Fuqua)         | 13        | 7         | 1         | 95,000        | 65.0           | 100.0          | 30           | 94.9       | A+        | A        | A        | A        |
| 9    | MIT (Sloan)          | 5         | 8         | 14        | 93,568        | 70.0           | 116.0          | 15           | 96.2       | B         | A+       | B        | A        |
| 10   | UC–Berkeley (Haas)   | 8         | 11        | 5         | 84,055        | 78.0           | 110.0          | 12           | 94.4       | A+        | A+       | B        | A        |
| 11   | Cornell (Johnson)    | 15        | 10        | 13        | 93,000        | 68.0           | 96.5           | 19           | 95.0       | A+        | A        | A+       | A+       |
| 12   | Dartmouth (Tuck)     | 11        | 16        | 7         | 91,905        | 65.0           | 115.0          | 16           | 95.0       | A+        | B        | A+       | A+       |
| 13   | NYU (Stern)          | 12        | 13        | 17        | 89,184        | 65.0           | 95.0           | 15           | 94.4       | B         | A        | B        | A        |
| 14   | UCLA (Anderson)      | 18        | 18        | 4         | 77,126        | 65.0           | 100.0          | 20           | 91.8       | A+        | A        | B        | B        |
| 15   | Indiana (Kelley)     | 9         | 19        | 27        | 76,440        | 44.0           | 92.0           | 34           | 96.2       | B+        | A        | A+       | A+       |
| 16   | Virginia (Darden)    | 14        | 12        | 38        | 94,000        | 63.0           | 100.0          | 25           | 95.4       | A+        | A        | A+       | A        |
| 17   | UNC (Kenan-Flagler)  | 17        | 14        | 19        | 81,401        | 60.0           | 95.0           | 34           | 96.0       | A+        | B        | A+       | B+       |
| 18   | SMU (Cox)            | 21        | 17        | 37        | 81,384        | 50.0           | 90.0           | 36           | 83.7       | B         | B        | A+       | A        |
### Exhibit 1 (continued)

2009 Businessweek Rankings of Top MBA Programs

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<thead>
<tr>
<th>Rank</th>
<th>School</th>
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<th>Corp Poll</th>
<th>Intel Cap</th>
<th>Tuition &amp; Fees</th>
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extent to which MBA programs incorporate social and environmental issues in their curriculum. The report then published rankings based on four criteria: (1) availability of relevant coursework; (2) student exposure (the extent to which students are actually taking the referenced courses); (3) relevant courses on for-profit impact (roll of business in improving environmental conditions; and (4) faculty research. The list and rank of U.S. schools who qualified for this study can be found in the Exhibit 2. A complete list of all 100 schools can be found at www.beyondgreypinstripes.org/rankings.

The third source is the College Sustainability Report Card. This report is published annually by the Sustainable Endowments Institute, and covers the colleges and universities with the 300 largest endowments in the U.S. and Canada, as well as 32 other schools that applied for inclusion. As a contrast to the other two ranking systems, the Report Card does not focus on academic or research programs related to sustainability, it examines the behavior of the university through the lens of sustainability. A partial list of these schools and their rankings can be found in Exhibit 3. Details on their methodology and individual school rankings can be found at: www.greenreportcard.org/report-card-2010/methodology.

**Culling the Performance Data**

Each source was given an equal weight of 33.3%. This determination was based on the desire to recognize excellence among programs that may not currently be top ranked by the business community, but are making aggressive moves in within their programs and universities to elevate their status and ranking. Therefore graduate business programs ranked in the second tier as determined by *Businessweek*, but show excellence in programming, research, and operations have the opportunity to showcase those efforts by scoring highly in those categories, and elevating their rankings for this list.

In order to be considered, programs met all of the following criteria: (1) Received a ranking by all three institutions (meaning schools are either a first or second tier graduate business program, and they offer meaningful coursework on sustainability, and the campus provides a living laboratory to experience some of these socially responsible actions); (2) Received a combined average of score of 100 or less (meaning the program averages in the top third in each category); and (3) Received a grade of B or higher as their average GPA on the College Sustainability Report Card (meaning they are slightly above the national average in implementing campus wide sustainable operations.)

After inputting that criteria, there were 14 business schools that remained: Stanford University, University of Michigan (Ross), Yale University, University of North Carolina–Charlotte (Kenan-Flagler), Columbia University, Duke University (Fuqua), University of California–Berkeley (Haas), New York University (Stern), Cornell University (Johnson), University of Notre Dame (Mendoza), Dartmouth College (Tuck), George Washington University, Carnegie Mellon University (Tepper), and Massachusetts Institute of Technology (Sloan).
### Exhibit 2 | Aspen Institute’s List of Global 100 Sustainable MBA Programs

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<th>Rank</th>
<th>School (Affiliation)</th>
<th>Relevant Courses</th>
<th>Student Exposure</th>
<th>For-Profit Impact</th>
<th>Faculty Research</th>
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**Exhibit 3**  (continued)
College Sustainability Report Card Grades by University

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Beyond the Rankings: Key Program Highlights

Although the list of 14 business schools represents an unscientific ranking of the top programs in the U.S., it does provide a manageable framework within which to examine (despite their high performance across a multitude of independent sources and rankings) whether these schools are actually meeting the needs of today’s young leaders and preparing them for the kind of comprehensive, integrated, and dynamic challenges they will face in a global business environment over the next few decades where sustainability will become (if it is not already) a key driver of operations and value. This next section provides an overview of what sets these 14 programs apart and lays another level of foundation for the discussion on whether educational institutions are integrating sustainability into core curriculum coursework effectively, ultimately positioning their graduates for success.

Stanford University Graduate School of Business

Stanford University is considered the number six business school in the country by Businessweek. The Aspen Institute ranked them the number two business school in the world in terms of relevant coursework in sustainability, as well as the application of those courses in a for-profit environment. Stanford earned an A− from the Sustainable Endowment Institute, recognizing them as an Overall College Sustainability Leader. They received marks of excellence for Green Buildings and Investment Priorities, among others.

In 2007, Stanford radically re-worked their MBA curriculum in four key ways: (1) eliminating course requirements, using placement exams and faculty advisors to create an individual study plan for each student; sometimes in classes with as few as ten students; (2) using an integrated systems-approach to learning, courses do not focus on a single discipline but encourage analysis of an issue that transcends any single function of management, such as alleviating global poverty; (3) exposure to cultural diversity by completing either an international internship, an overseas learning trip, or a student exchange program; and (4) capstone project examining a student’s strengths and weaknesses within the business environment, honing their communication skills through self-evaluation.

In January of 2010, Stanford Business School launched the “Social-M Challenge,” a social-movement business plan competition designed to inspire sustainability-themed behavior change within a local or global environment.

Within the Business School, the Center for Social Innovation offers an MBA/Public Management Program designed to build knowledge in sustainable business practices and social entrepreneurship (among other areas), as well as the role of these sectors in creating social and environmental value. They also offer a joint MBA/MS degree in environmental sciences.

Stanford Business School has a $350 million campus under construction that is expected to deliver in 2011, and designed to earn a LEED Platinum certification from the U.S. Green Building Council.
One interesting elective course from their curriculum that focuses on sustainability and the for-profit world within the context of marketing is (MKTG 551) Initiating, Sustaining, & Monetizing Green Marketing, offered through the Department of Environmental Management. Their website Sustainable Stanford offers a report card on how Stanford is performing in twelve categories of environmental stewardship.

University of Michigan, Stephen M. Ross School of Business

The Ross School of Business is ranked as the number five business school in the country by Businessweek, and number one on the Global 100 list of sustainable MBA programs. In terms of their for-profit impact, integrating sustainability into traditional business settings, they are also number one out of 590 globally ranked programs. They received a grade of B+ on their campus-wide sustainability initiatives with excellence in their investment priorities, and a B in terms of green buildings.

Their partnership with the School of Natural Resources offers a three-year dual MBA/MS degree focused on Global Sustainable Enterprise. Ross Business School has also been named Net Impact Chapter of the Year in 2007, 2008, and 2009.10 Ross graduate students won for their initiative to make all food scraps, utensils, cups, plates, and bowls purchased at the Ross Cafeteria 100% compostable—diverting up to 50% of the waste that would have otherwise gone to a landfill, as well as for instituting green building standards for the university to reduce the environmental footprint of all new building construction and major renovations on campus.11

One notable elective program from their dual degree program is STRAT 564/ SNRE 513: Competitive Environmental Strategy. “This course deals with environmental issues from a strategic perspective, focusing on how environmental pressures (e.g., sustainable development) and environmental problems (e.g., global warming, air pollution, waste disposal) impact corporate mission, competitive strategy, technology choices, product development decisions, and production process.”12

Yale University, School of Management

Yale School of Management (SOM) is ranked number 24 by Businessweek, and second in the Global 100 list. The School of Management ranked third globally for the number of relevant courses on sustainability, and fourth for the number of students who take those programs, and for those course’s for-profit impact. Their overall GPA of A— on the Sustainable Report Card also makes them an Overall College Sustainability Leader. Yale received straight A’s in eight out of nine total categories on the Report Card, making their campus initiatives the most comprehensive of any schools examined in this study.

SOM integrates social and environmental considerations into the majority of their curriculum, studying programs such as GE’s Ecomagination Initiative, as well as creating their own multi-media case studies such as “Giving Voice to Values,”
a curriculum initiative created for the Aspen Institute’s Center for Business Education Business Leadership Case Study Competition.13

Yale SOM’s Net Impact Chapter was Chapter of the Year in 2005, and an award winner in 2007 for their (now) annual fundraising initiative to buy Renewable Energy Credits (RECs) to offset the schools carbon footprint. In 2008, the school won Philadelphia’s Green Economy Case Competition with their concept to create green jobs by initiating a “Philly Fund” credit card that would direct 1% of the net transactions to a business incubator that would provide start-up money to promising local start-ups that are focused on “People, Planet, Profit.”14

One interesting course from their elective curriculum is called Energy, Economics, and the Environment.

University of North Carolina, Chapel Hill, Kenan-Flagler Business School

Kenan-Flagler Business School is ranked number 17 by Businessweek, and number 12 on the list of Global 100 graduate business schools. Their course work is ranked second in terms of its for-profit impact, and 16th in terms of the number of courses that are available to students. They received an overall grade of A− on the Sustainability Report Card, making them an Overall College Sustainability Leader. They received seven A’s for their on-campus initiatives.

Innovative programs at Kenan-Flagler include the National Sustainable Investment Competition, launched in 2003 by their Net Impact Club. This annual competition gives students from top business schools real-world venture capital experience as well as an awareness of double or triple bottom line valuation techniques.15 The Business Accelerator for Sustainable Entrepreneurship (BASE) business incubator is designed to help speed the growth of companies addressing financial profitability, social equity, and environmental sustainability.16 Since 1998, they have also hosted an annual Sustainable Business Career Fair, which focuses on recruitment by organizations specifically looking to fill positions or internships at socially responsible organizations.17

Columbia University, Columbia Business School

Columbia Business School is ranked number seven by Businessweek, and number eight on the Global 100 list. Their faculty research on issues related to sustainability is ranked fifth globally, and their for-profit impact is ranked seventh. Their overall sustainability grade related to campus initiatives is a B, and though they received a grade of C on their climate and energy initiatives, all other scores were a B or above.

The Individual, Business and Society (IBS) curriculum attempts to focus students on the competing demands of businesses, individuals, and society. Some specific non-curriculum activities include the Global Social Venture Competition, which is a partnership between Columbia Business School, Hass School of Business, the London Business School, and the Indian School of Business, which promotes ventures that measure both social and financial returns.18
Columbia has a Social Enterprise program that initiates summer internships with for-profit and not-for-profit organizations with a focus on sustainability. The Eugene Lang Entrepreneurship Center has funded socially conscious business ventures from graduates such as the Mamatini, a bottled organic, herbal infused drink to help nursing mothers increase their energy and breast milk supply. The Chazen Institute of International Business supports study trips with students and faculty members that have a corporate social responsibility and international development focus, and the Paul Milstein Center for Real Estate has supported winning business plans that address urban renewal and community development issues.

**Duke University, Fuqua School of Business**

The Fuqua School of Business is ranked number eight by *Businessweek* and number 14 on the list of Global 100 sustainable MBA programs. They rank 14th globally for both the number of relevant courses on sustainability, as well as the for-profit impact of those courses. They rank 49th in terms of the number of students actually taking those programs, and 55th in terms of faculty research. Duke received an overall grade of B+ from the College Sustainability Report Card. They received seven A grades, but their F in Endowment Transparency and B in Shareholder Engagement brought their overall average down below the level needed to be a Sustainability Leader.

One of the more interesting initiatives at Fuqua is the Big Think program, which is an online forum where people can share their thoughts and ideas in any type of media. The site includes interviews with subject experts and thought leaders, as well as student initiatives from the Net Impact club and other groups. Big Think then connects to various social networks like YouTube, Facebook, and Twitter, sharing these ideas to the global online community.

Fuqua launched a Corporate Sustainability Initiative (CSI) in 2007. The goal of this program is twofold: develop the theory and practice of corporate sustainability, and educate business professionals on how to implement them. Additionally, the business school participates in the university-wide Nicholas Institute for Environmental Policy Solutions, which engages with public, private, and social sector decision-makers to develop innovative proposals that address critical environmental challenges. Finally, the Center for Energy, Development, and the Global Environment (EDGE) within Duke’s Fuqua School of Business examines issues such as how to meet the global demand for energy, identifying pathways toward sustainable energy systems and economic systems that accelerate market transformations.

One interesting elective course offered through the Department of Corporate Responsibility/Business Ethics is Corporate Social Impact Management.

**University of California at Berkeley, Haas Business School**

The Haas Business School is ranked as the 10th best graduate business program in the country by *Businessweek*, and sixth overall on the list of Global 100
sustainable MBA programs. They are listed fourth in terms of faculty research, fifth in for-profit impact, and seventh in terms of the number of relevant courses offered. However, the number of students actually taking those courses is ranked 31st on the list. In terms of the Sustainability Report Card, Haas received an overall grade of B. Low marks came from the following: a B in both Green Buildings and Transportation, a C in Investment Priorities and Endowment Transparency, and an F in Shareholder Engagement. Still high marks in Climate & Energy, Food & Recycling, and Student Involvement help keep their GPA high enough to make the final list.

In 2010, *The Financial Times* ranked Haas Business School the number two program globally for Corporate Social Responsibility (preceded by Notre Dame’s Mendoza Business School, who also appears on this list.) In 2003, Haas launched the Center for Responsible Business, and this program has seen considerable success in just seven years. According to the Center for Responsible Business’s Biennial Report, through 2008 they have launched cutting-edge programs such as Sustainable Products & Solutions. This collaboration from the Haas Business School and the College of Chemistry is possible through a 5-year, $10 million endowment from the Dow Chemical Company. This program has resulted in the development of environmentally safe hand sanitizer, sustainable packaging standards, and arsenic remediation in the drinking water in Bangladesh. It has also led to the development of student fellowships, speaker series’, and teaching seminars.

Other experiential learning programs offered through the Center for Responsible Business include a year-long LifeScan Community Relations Graduate Fellow Program, and a semester long program, McDonald’s CRS Research Fellows, where students develop and help integrate corporate social responsibility initiatives into these organizations. They also have a student-run Socially Responsible Investment Fund. Since its inception this program has published 37 Working Papers on Sustainability.

The Lawrence Berkeley National Laboratory is an internationally renowned institution that led in early research on Green Buildings, including the landmark 2003 study by Greg Katz, “The Costs and Financial Benefits of Green Buildings,” also works with student teams from the Haas Business School to develop strategies that commercialize their discoveries.

Haas Business School also joined forces with the College of Natural Resources to create the Berkeley Energy Resources Collaborative to work on problems and solutions of energy independence. The new Center for Energy & Environmental Innovation offers interdisciplinary curricula also designed to develop sustainable energy solutions.

One interesting course from their diverse curricula is Energy and Environmental Markets. Topics include the development and effect of organized spot, futures, and derivative markets in energy; the political economy of deregulation; climate change, environmental impacts, and policies related to energy production and use; privatization of publicly-owned energy assets; market power and antitrust; and the transportation and storage of energy commodities.
New York University, Stern School of Business

Stern School of Business is ranked number 13 by Businessweek for graduate business programs. The Global 100 list of sustainable MBA programs ranks them number seven. Stern is fifth out of 590 international graduate business programs in terms of the number of courses that they offer, and 10th in terms of the number of students that take those courses. Their for-profit impact is 14th on the list, and faculty research is 29th. The College Sustainability Report Card gives New York University an overall grade of B. While they received A’s in six of nine categories, their B in Green Buildings, D in Endowment Transparency, and F in Shareholder Engagement brought down their overall grade point average. However, their A in Investment Priorities indicates a move towards greater on-campus sustainability.

Stern has implemented a Campus Greening Initiative, which led to an A grade in terms of their current and future investment priorities in the Sustainability Report Card.

MBA students have the opportunity to create a concentration in Social Innovation and Impact, which focuses on intersecting corporate wealth creation and corporate social impact, providing social, environmental, and economic perspectives to enhance competition and have a positive impact on the community and environment.

In 2003, Stern launched the Markets, Ethics, and Law Program. A hallmark of the program is the appointment of a distinguished fellow, whom students then interact with frequently throughout the year. One such example is Fred Krupp, President of the Environmental Defense Fund. Additionally, Stern, like many other top business schools, has a student-run Socially Responsible Investment Fund.

In 2009, NYU began offering a Graduate Certificate Program in Sustainable Design, Construction, and Development. Two required courses of this program include Principles of Environmentally Sustainable Design and Managing Sustainable Building Projects. These courses cover issues such as lifecycle costing, rating systems, financial incentives, design, and construction techniques, as well as evaluating and selecting products, construction waste management, and more. One innovative elective course offered at the Stern is Leading Sustainable Enterprises.

Cornell University, Samuel Curtis Johnson Graduate School of Management

The Johnson Graduate School of Management is ranked 11th on Businessweek’s list of top graduate business schools. They are ranked 10th on the list of Global 100 MBA programs, ranking 13th with the number of courses they offer, and 7th in their for-profit impact, but they are 36th in terms of the number of students that are actively engaged in those classes. Faculty research gets a rank of 26 out of 590 schools surveyed. Their overall grade on the College Sustainability Report Card is a B. This is surprising as Cornell’s sustainable programming extends well beyond their business school. Their School of Forestry is considered world-class, and they have an extensive organic garden that provides seasonal produce to the
on-campus dining facilities. Their grades across the board were mostly B’s, with A’s in Administration and Investment Priorities, which offsets their C’s in Green Buildings and Shareholder Engagement.

The School of Management frames the issue of sustainability as an unmet market need that can be addressed through innovation leading to a competitive advantage. This is somewhat of a departure from some other programs that tend to frame the issue more in terms of ethics or corporate social responsibility. Their Center for Sustainable Global Enterprise (SGE) focuses on a systems-based approach to education leveraging all degree programs at the university, in an effort to create a program designed to address complex issues of sustainability using interrelated skills that lead to practical business solutions.31 Their SGE Immersion Program is an optional part of the core MBA program, where, in addition to their core coursework, students engage in field projects to address real problems currently being faced by sponsoring companies.

Additionally the school has partnered with eleven countries to create an expertise in low-income market development and sustainable innovation that addresses the needs of the world’s poorest countries in ways that are both culturally appropriate and environmentally responsible, including working with the US Army and Marine Corps on ways to help rebuild infrastructure in places like Iraq, Afghanistan, Philippines, and more.

**University of Notre Dame, Mendoza College of Business**

The Mendoza College of Business is ranked 20th on *Businessweek*’s list of top MBA programs, and fourth on the Global 100 list of sustainable MBA programs. This gap is the second largest between the two program rankings. Mendoza is ranked third globally for their faculty research, fourth for the number of relevant courses related to sustainability, and fifth in terms of the number of students at the business school who register for those courses. The for-profit impact of those courses received a rank of 14 out of 590. Their overall grade for the College Sustainability Report Card was a B, with the school receiving three A’s for Administration, Student Involvement and Investment Priorities, four B’s for Climate Change & Energy, Food & Recycling, Green Buildings, and Transportation, one C in Shareholder Engagement, and a D in Endowment Transparency.

In 2005, the College of Business introduced a new curriculum focused on problem-solving in the context of three issues: individual ethics, organizational effectiveness, and social responsibility. This program includes 14 required courses, and offers 93 electives, each designed to integrate all three of the issues outlined above. Some of these more interesting classes include: The UN Global Compact & the Future of the Economy, and Deep Dive, where students examine issues related to sustainability at leading organizations such as recycling, product development, and reducing the carbon footprint of Coca-Cola32 and Ten Years Hence, a one-credit speaker series program that explores ideas, issues, and trends likely to affect business and society over the next decade.33
The College of Business is a founding member of Principles for Responsible Management Education (PRME), which is a consortium of 225 global business schools that are committed to incorporating the values of the UN Global Compact into their business school curricula and research. Their chapter of Net Impact recently won the 2009 Sustainability Case Competition, focused on renewable energy systems.

The UN Global Compact & the Future of the Economy is an example of one course designed to connect students with the business, environmental, and ethical issues facing the world economy.

Dartmouth College, Tuck School of Business

The Tuck School of Business is ranked number 12 on the Businessweek list of top US graduate business programs. The Global 100 list of sustainable MBA programs ranks Tuck at number 35. Their high scores were in the number of relevant courses and the for-profit impact of those courses, where Tuck ranked 23rd out of 590 global programs. The number of students actually taking those courses, showed up 75th on the list of programs, and their faulty research was ranked 96th out of 590. Their overall grade on the College Sustainability Report Card was a B+, with no single category receiving lower than a B, which is unusual. Highest marks came from Climate & Energy, Food & Recycling, Student Involvement, and Shareholder Engagement; where Administration, Green Buildings, Transportation, Endowment Transparency, and Investment Priorities all received a grade of B.

Sustainability initiatives were not as easy to identify at Tuck compared to the other business schools examined. They offer just one degree through the business school (MBA) and have a total of only 212 students. However, the Net Impact chapter is one of the largest student organizations within the graduate business program, with 170 members.34 The school’s Allwin Initiative for Corporate Citizenship is a program designed to be the nexus of business and society. Students who participate enter into case competitions through the Aspen Institute, and have served as delegates to the UN conference in Copenhagen that outlined a plan for leading global business programs to teach the UN Global Compact.35 The Allwin Student Roundtable gives students an administrative voice in helping set and directs the long-term goals for the School of Business.36 They offer significant access to conferences that deal with issues of sustainability, including the recent Building a New Model—Resource Constraints on the Path to Prosperity.37

The School’s Net Impact website noted that because of the small size of their business school, there is typically only one or two classes offered on sustainability per semester. However, additional classes are offered through the other Dartmouth schools and Tuck students are able to apply those courses towards their MBA. One interesting course is offered through the Engineering School, Department of Environmental Management, called Industrial Ecology, where students study the flow of materials and energy through industrial systems.
George Washington University, School of Business

The George Washington School of Business is among the list of second-tier graduate business schools on the *Businessweek* list. As mentioned previously, there were 15 schools that were listed as second tier after the top 30 programs were ranked. All second-tier programs received a ranking of 45 for purposes of this analysis. It was George Washington’s rank of 11 in the Global 100 list that enabled them to be the only second-tier graduate business program that made the final list of schools for this study. The School of Business ranked fifth out of 590 schools in terms of the number of courses that they offer on sustainability. They were 23rd in terms of the for-profit impact of those courses and 42nd for the number of students that are actually enrolled in those courses. Their sustainable research ranked 26th out of the 590 global programs surveyed. Their overall GPA as listed on the College Sustainability Report Card was a B. The School of Business received A’s in five categories including: Administration, Food & Recycling, Student Involvement, Transportation, and Investment Priorities. They received B’s in Climate Change & Energy as well as Green Buildings. The university received an F in both Endowment Transparency and Shareholder Engagement.

The location of the School of Business is ideal for leveraging government, non-profit, and trade organizations that are involved with sustainability and the creation of public policy. The business school offers two concentrations with a sustainable focus: Environmental Policy & Management and Strategic Management & Public Policy. They also offer a global MBA program known as Global Leadership of Business Enterprise (GLOBE) that is a two-year full-time MBA program where the first year is dedicated to developing business skills within the context of a global economy.38

The George Washington Institute for Corporate Responsibility and the Institute for the Analysis of Solar Energy are two organizations that facilitate both faculty research on sustainability and the development of coursework. One of the more interesting programs offered through the School of Business is called Environment, Energy, Technology, and Society. The course focuses on identification, investigation, and evaluation of how environment, energy, and technology are inter-related, and how these interactions influence social and public policy.

Carnegie Mellon University, Tepper School of Business

Carnegie Mellon is ranked number 19 on the *Businessweek* list of top MBA programs, and number 38 on the Global 100 list of top sustainable MBA programs. They were ranked 9th globally in terms of their student exposure to courses that focus on sustainable issues, although they were 45th in terms of the number of programs that they offer, and 71st in terms of their for-profit impact. Faculty research at Tepper was ranked 85th out of 590 global programs. Carnegie Mellon’s overall GPA on the College Sustainability Report Card was a B. Although they received A’s in six of nine categories, including: Climate Change & Energy,
Food & Recycling, Green Buildings, Student Involvement, Transportation and Investment Priorities. They received a C in Administration and a D in both Endowment Transparency and Shareholder Engagement.

All students who attend Tepper must attend a 12-hour introductory course on ethics during their orientation, which has a substantial focus on sustainability. Student groups include Net Impact, as well as the Tepper Energy Club. Every year they host a Meginnis Venture Competition, and in 2007 they added a Sustainable Technology Award for a business that has created a product or use that is original, profitable, and sustainable in terms of climate change mitigation, energy efficiency, or materials and water use.39

Massachusetts Institute of Technology, Sloan School of Management

The Sloan School of Management has a combined score of 100. Sloan is ranked number 9 on the Businessweek list of top MBA programs, and number 60 on the Global 100 list of top sustainable MBA programs. This is largely due to their low score in terms of faculty research, where Sloan ranked 134th out of 590 global business programs. The number of courses offered in sustainability was ranked 33rd and the for-profit impact of those courses was 32nd on the list. The number of students enrolled in these classes ranked them 77th out of 590. The College Sustainability Report Card gives Sloan a combined GPA of B+. They received A’s in Food & Recycling, Green Buildings, Student Involvement, Transportation, and Investment Priorities, and B’s in Administration, Climate Change & Energy, and Shareholder Engagement. They received an F in Endowment Transparency.

Despite their low scores on the Global 100 list, information on sustainability at Sloan was easy to find. In 2007, they created the MIT Sloan Initiative for Sustainable Business & Society (S-Lab) as a means to change the way businesses use and manage resources.40 Based on collaborations with Fortune 500 companies, start-ups, NGO’s, and non-profits, this program offers students real-world consulting opportunities and case study development. The S-Lab also offers a Sustainable Business Certificate41 consisting of four required classes and one capstone course. This can be pursued while achieving the MBA degree. The S-Lab also offers podcasts that feature topics of sustainability including Will Sustainability Sell? and Sustainability in the Built Environment.42

A new introduction to the MIT Sloan curriculum in the Sloan Innovation Period (SIP) that replaces the traditional 13-week semester with two six-week classes that feature a one-week intensive, hands-on learning experience in the middle. Topics are focused on research initiatives being conducted within the business school.43

Sloan has other interesting projects like the Center for Collaborative Intelligence, Sustainable Food Lab, and the Alliance for Global Strategy, which address issues of sustainability. However, the most creative project is the Greenhouse Gas Emissions simulator, which is an online tutorial and interactive learning experience that teaches about greenhouse gasses, global warming, and to what degree we need to change behavior to effect positive changes to the environment.
One of the interesting courses offered by the Sloan School of Management is Global Climate Change: Economics, Science, and Policy. This course introduces scientific, economic, and ecological issues threatening the global climate, and the institutions engaged in negotiating and international response.

**Ideal Curriculum**

There is a growing trend towards incorporating concepts of sustainability into academic curricula and research. However, many of these courses are still focused on the moral and ethical implications of the topic, viewing sustainable design in terms of corporate or social responsibility, rather than as a part of a core business strategy that can provide financial gain. Additionally, the majority of these courses are offered as electives rather than as an integrated part of a core curriculum. The primary challenge to implementation is likely that regulatory issues, as well as climate change science and resource constraints are relatively new to mainstream economics, and these issues are not well-addressed through traditional neo-classical formats of study.

One of the major components we need to address in the context of business and the economy is how we define sustainability. To an environmentalist sustainability may imply the definition given from the Brundtland Principles, from the UN Report of the World Commission on Environment and Development: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” To a business person sustainability could simply be throughput, or output relative to input. In order for a business to sustain itself, it must get out more than it puts in, and the extent to which you are able to put in less and get out more, productivity and profits rise. The business can sustain itself, and ultimately grow. At the most basic level these two definitions are very similar—get more from less, and productivity and profits will rise.

Part of the problem with this over simplification is what we choose to define, or more accurately what we choose to include, in our accounting of inputs and outputs. The industrial revolution forever changed how we source our “inputs” and what we consider an “output.” For generations we have discounted the true cost of production by not accounting for the true cost of the inputs; natural resources themselves (based on cost to extract and regenerate, as well as the ecosystem service they provide and the costs to reproduce those services such as habitat, water filtration, temperature control, etc.) transportation, labor, corruption, etc; and the actual net value of the outputs, which would be the value of the product being sold, less the cost of pollution, toxic waste, the permanent damage to ecosystems, and the loss of natural resources due to comingleing products that keeps them from being reused or recycled either in terms of a new product, or through the natural process of biodegrading, among other things.

It would be a major understatement to conclude that changing the industrial process, as well as the entire concept of neoclassical economics by eliminating...
free-riders, is unlikely. Because of this, many businesses, governments, and individuals have tried to adapt programs or slogans, like the 3 R’s: Reduce, Reuse, and Recycle. The problem with slogans like this is that we are a society, a global society that likes to consume. When we have money, we like to spend it, and businesses like creating products that entice us to do just that. So, now we are talking about two major impediments to change: severe complexity and lack of desire. That is why, as William McDonough so aptly states in his seminal book *Cradle to Cradle*, “Being less bad is no good.” This phrase is both exciting and inspiring. Rather than castigate, it challenges us to do what we as humans do best: evolve. It represents a revolution and a renaissance all in one. And it begins with possibilities, ones that can best be explored through the combination of technical skill and philosophy that is the hallmark of higher education.

This combination of technical skill and philosophy is a hallmark of systems-based thinking. Sustainability needs to be an integrated component of a comprehensive business philosophy that sees the role as a primary driver of profits and competitive advantage. Integrating this into the existing framework of core classes then opens the door for more complex instruction through specialization and the development of meaningful knowledge for those who choose to concentrate their degree in this area. This concentration can then be much more impactful, specific, and technical in nature because it has evolved from a basic overview to a competitive tool that can be used to perform at a higher level in finance, strategy, marketing, and/or operations.

An illustration of this concept using the course syllabus (Exhibit 4) for Johns Hopkins Carey School of Business, Special Topics in Real Estate: Sustainable Real Estate Development and Finance, Spring 2009 is provided here for discussion. The course overview lists five primary learning objectives, noted as Enduring Understandings. Examples will be given as to how each objective can easily be incorporated into existing coursework included in the Core Program Requirements for the Masters of Real Estate Program. The primary learning objectives are:

1. Understanding the role that real estate plays in the consumption of energy and production of greenhouse gases that has influenced the development of public policy for sustainable development.

2. While sustainable buildings allow for the conservation of energy and other natural resources, these savings can be greatly enhanced through sustainable land use planning practices at the city and regional levels that allow for the better integration of residential, commercial, and open space land uses.

3. Provide an understanding of sustainable building principles and how life cycle cost analysis represents a philosophical departure from traditional first cost analysis.

4. Providing constructive working knowledge of sustainable planning, construction, marketing, and certification process.

5. Provide a framework for objectively analyzing and evaluating sustainability features on the financial performance of a commercial real estate project.
Course Overview
The course is intended to appropriately balance theoretical and practical applications of sustainable development that will provide students a basis for objectively analyzing the potential impact of green or sustainability features on new and existing commercial real estate projects. This class was developed to also explore the broader application of sustainability principles on large scale planning efforts and the potential beneficial broader impacts on quality of life and environmental preservation.

Enduring Understandings
1. Understanding of the role that real estate plays in the consumption of energy and production of greenhouse gases that has influenced the development of public policy for sustainable development. This relates to Program Objectives 3 and 4.
2. While sustainable buildings allow for the conservation of energy and other natural resources, these saving can be greatly enhanced through sustainable land use planning practices at the city and regional levels that allow for the better integration of residential, commercial, and open space land uses. This relates to Program Objective 3.
3. Provide an understanding of sustainable building principles and how life cycle cost analysis represents a philosophical departure from traditional first cost analysis. This relates to Program Objectives 1, 2, and 6.
4. Providing constructive working knowledge of sustainable planning, construction, marketing, and certification process. This relates to Program Objectives 1 and 2.

Provide a framework for objectively analyzing and evaluating sustainability features on the financial performance of a commercial real estate project. This relates to Program Objectives 5 and 6.

Consumption of Energy and Production of Greenhouse Gasses: These topics can easily be integrated into existing coursework on Urban Economics, Site Planning and Building Design, Land Use Regulation, and Ethics and Humanity.

Development of Public Policy: This can be integrated into Land Use Regulation, Legal Issues in Real Estate, Real Estate Development Process, and Business Communication.

Conservation of Energy and Other Natural Resources: This can be taught as a component of Urban Economics, Financial Modeling for Real Estate, Site Planning and Building Design, Construction Project Delivery, and Land Use Regulation.

Land Use Planning: This can be taught as a component of Land Use Regulation, Urban Land Economics, Site Planning and Building Design, and Real Estate Development Process.

Sustainable Building Principles: This can be addressed through courses on Site Planning and Building Design, Real Estate Development Process, Construction Project Delivery, Land Use Regulation, Business Communication, Urban Land Economics, and Ethics and Humanity.

Planning, Construction, Marketing and Certification: Each of these can be addressed individually through the following existing courses; Site
Planning and/or Land Use Regulation, Construction Project Delivery, Business Communication, and Real Estate Development Process and/or Construction Project Delivery.

Analyzing and Evaluating Financial Performance: This can be addressed in existing courses on Market Analysis and Financial Modeling for Real Estate.

This simple exercise illustrates how concepts that are reserved for discussions in classes specifically geared towards sustainable practices can easily be integrated into the core curriculum, creating a more systems-level understanding of these concepts, and leaving degree concentrations open to exploring more in-depth topics that can help develop graduates into thought leaders.

Getting to Green: “Sustainable” Sustainability

A chief sustainability officer at a real estate development company was asked: “What’s the most important thing that people should know if they want to work in the field of sustainability?” He answered, “Their job.” Meaning you have to actually know how to do something. You cannot get a job in sustainability. You must take a practice within a field that you know and reinvent it. But first and foremost, you must know what you do, and why you are doing it. Graduate business programs are designed to create leaders. But in order to lead you must understand what you are doing and why, so that you can begin to identify opportunities to do things better, smarter, faster, and safer because that is what will sustain your enterprise, your planet, and yourself.

A good education combines practical knowledge and theory. Most of the core curriculum within a graduate business program is focused on “how” to do things. These courses tend to comprise the more technical skills used to complete a task, such as how to read a lease, or construction drawings, how to increase throughput, or do a discounted cash flow analysis. This leaves room for deeper skill development and/or creativity within the elective course work, or specialty concentrations.

Based on this study of top business schools in America, most are well suited to provide basic elements of sustainability in their core curriculum. Basic elements are determined according to the dearth of information and material available for use in case studies, including transportation, non-renewable resource constraints, pollution, corporate social responsibility, marketing and communication of value (including recruiting, retention, workforce health), regulatory advantages, and change management, among many others, all under the umbrella of driving operational value and profits.

Four representative courses have been created for this study that represent a concentration in sustainable real estate, with the assumption that all core classes would include elements of sustainability as a component of the course work so that these specialized courses do not need to focus on the most basic elements of
sustainable practices. These courses are based on the key areas of study currently being offered at these top business programs, but represent original thought and content in their presentation. They were selected based on the broad cross-section of interests that affect the greatest number of people: economic framework (difference between a long- and short-term economy and how each has a role to play in sustainability), practical applications of new technologies that are driving value today, workforce health and productivity, and community-based initiatives (in a for-profit environment).

A concentration in sustainable real estate would include these four classes: (1) A New World Order in Sustainable Design: Environmental Economics, Ecology and Best Practices in Sustainability; (2) Energy, the Economy, and Existing Buildings; (3) Sustainable Design as a Core Business Strategy: Productivity and the Workplace; and (4) Reimagining a World City: Sustainable Community Development. Description of the course work for these classes appears below.

**Course Syllabus: A New World Order in Sustainable Design: Environmental Economics, Ecology, and Best Practices in Sustainability**

“No problem can be solved by the same consciousness that created it.” Albert Einstein

“A manager’s job is to do something right (to be efficient), but an executive’s job is to do the right thing (to be effective).” Peter Drucker

When looking at the role of real estate in the broader concept of the business world and its impact on the global economy, it is easy to see that leadership is not created or sustained simply by meeting the minimum standards for building design. Today’s business and thought leaders must re-imagine the process, and ask how can their product enhance the economic, ecological, and social health of those who construct, work in, and live near the facility. This is the challenge that will be addressed through this course.

**Recommended Textbook**
*Blueprint for a Sustainable Economy.* D. Pearce and E. Barber (2000).

**Additional Reading**
*Mid-Course Correction: Toward a Sustainable Enterprise: The Interface Model.* R. Anderson. Published by Chelsea Green (1999).

**Week 1**
Overview of Traditional Economic Theory: An Overview
Ecological Economics: History and Theory
Tools and Applications: Introduction of transforming theory into practice

**Topics Covered**
- Microeconomics: Supply/Demand, Utility, Opportunity Cost
- Macroeconomics: Public Policy and Growth
- Environmental Economics
- Resource Economics
- Ecological Economics: Economy as a subset of the environment, welfare, public policy, and sustainability
- Overview of tools and applications for translating theory into practice: life cycle assessments, technological innovation, backcasting, discounting, leading indicators (GDP, ISEW, GPI)

**Readings/Presentations**

This article explores the economy’s relationship to the ecosystem and why limitless economic growth is impossible.

This article questions the efficacy of market-based environmental policy.

**Assignment**

Write a brief memo (no more than 2 pages) on something you learned this week that surprised or interested you, and why. It can be related to your work or of personal interest.

**Week 2**

What Does a Sustainable World Look Like?

**Topics Covered**

- Weak versus Strong Sustainability
- Linking Economic Efficiency and Sustainability

**Readings**


**Assignment**

Write a two-page memo on how the real estate industry can help meet the goals and objectives of the UN Report, Our Common Future.

**Week 3**

Decision Making Frameworks: Valuing Ecosystem Services

**Topics**

- Mitigation (costs and benefits)
- Risk and Uncertainty
- Present Needs versus Future Needs
- Lifecycle Analysis
- Limitations and Alternatives to Monetary Valuations

**Readings**

Assignment
Write a two-page memo on how ecosystem services are accounted for in the design and development of green buildings.

Week 4
Macroeconomic Approaches to Measuring Sustainable Development

Topics
- Understanding and Measuring GNP
- Green GNP: Modifying GNP for Non-market Values
- Review for Mid-Term Exam (take home)

Readings
Chapter 4, Measuring Sustainable Development: Economic Approaches. Pearce & Barbier.
Chapter 5, Measuring Sustainable Development: Ecological Approaches. Pearce & Barbier.

Assignment
Take Home Exam

Week 5
Review of Take Home Exam
Causes of Environmental and Social Degradation

Topics
- Government Policy: Successes and Failures
- Social and Environmental Measurement and Accounting
- Multi Criteria Analysis (MCA)

Readings
Chapter 6, Causes of Environmental and Social Degradation. Pearce & Barbier.

Week 6
Solving Environmental Problems

Topics
- Property Rights
- Market Policy Instruments: Taxation, Cap and Trade, Incentives, Rebates
- Capital Markets and the Global Economy

Readings
Chapter 8, Solving Environmental Problems: Policy Instruments. Pearce & Barbier.
Assignment
Write a two-page memo on one market policy related to green buildings that you think is particularly effective and why.

Week 7
International Comparison of Green Building Rating Tools

Topics
- Overview of International Green Building Certifications
- Living Building Challenge
- SMART Certified
- Cradle-to-Cradle certification

Readings

Assignment
Write a two-page memo comparing and contrasting LEED, BREEAM, and the Living Building Challenge.

Week 8
Presentations of Final Project: A Sustainable Certification Program.

Assignment
Final paper and class presentation integrating the lessons you learned in this course, and through Ray Anderson’s book Mid-Course Correction, and devise a certification program of sustainability that can be immediately implemented within your organization.

Course Syllabus: Energy, the Economy, and Existing Buildings

Businesses are a key part of the environmental picture in terms of global governance and a key part of the climate solution, whose success requires implementation by businesses. However, policies on climate change and energy efficiency are largely limited due to a fragmented, weak, and undeveloped market. This fragmentation leads to a wait-and-see attitude among businesses who do not want to get stuck making financial commitments to policies and/or technologies that will ultimately be replaced with newer, better, or more politically popular concepts. In response to this, many local governments have tried to respond with their own initiatives and guidelines, as well as businesses who have undertaken these projects on their own accord, believing there is either, at best, a financial advantage, and at worst, a brand advantage, to being an early mover in these areas.

The first part of this course will examine some of the above mentioned policies and the challenges to implementation, as well as market leading concepts that are slowly helping us move towards more environmentally responsible energy policies. The second half of the class will focus on methods of implementing energy efficiency in existing buildings.
Recommended Textbook

Week 1
Exploring government-sponsored policies and programs, as well as business organizations involved in determining climate change policy for the U.S. An introduction to green buildings and the importance of retrofits from a GHG perspective, as well as the challenges to implementation of sustainable practices.

Topics
Introduction and overview of the following:
- Clean Air Act
- Kyoto Protocol
- Waxman-Markey bill
- New Energy Plan for America
- Barriers to Retrofitting An Office Building
- Case Study: The Empire State Building Goes Green

Readings

Assignments
Write a two-page memo on your thoughts about environmental regulation. Does it enhance competitiveness or it is an annoying cost? Why. Use facts, logic, and contemporary examples to back up your opinion.

Week 2
Energy Supply and Demand and Unlocking Solutions to Energy Policy in the U.S.

Topics
- Pricing
- Market Power and Scarcity
- Regulated and Unregulated Energy Markets
- Renewable Energy Purchasing
- Cap and Trade
- Carbon Disclosure
- Climate Registry

Energy Efficiency Potential in the U.S. Economy
- NPV Positive Opportunities
- Efficiency by Market Sector (special emphasis on real estate)
- Barriers to Implementation
- Elements of a Holistic Strategy

Readings
Review: Carbon Disclosure Project Website: http://cdproject.net/

Assignments
Write a three-page memo on whether benefits and drawbacks of voluntary versus compulsory carbon reduction programs in the context of what you have learned about the Kyoto Protocol, Waxman-Markey bill, Cap and Trade, and Carbon Disclosure. Which strategic solutions you think would be most successful in terms of rapid implementation and why. Identify challenges to implementation, ways to mitigate them, as well as recommendations to enhance successful strategies.

Week 3
Planning a green office retrofit.

Topics
- Defining a Strategy for Green Retrofit
- Code Standards and Voluntary Certification Programs
- Cost Benefit and Analysis of Green Retrofit Opportunity
- McDonalds Case Study
- 1828 L Street Case Study: Working towards ENERGY STAR

Readings

Assignment
Create a cost-benefit analysis for three green features within your corporate office space, or within a building of your choice. This should include a description of the upgrade (e.g., eliminating incandescent lighting, installing occupancy sensors, adding a building energy management system or changing out chillers), the initial costs to install, annual commodity savings, annual cost savings, and simple payback.

For this exercise you will need to have access to your electrical consumption in terms of total KWh, as well as your cost per kilowatt. If these are not available to you, please use publicly available information regarding averages for this region, and detail where you got your numbers and why they are an accurate representation.

You have two weeks to complete this assignment.

Week 4
Retrofitting office buildings for energy efficiency.

Topics
- Evaluating Site and Climate Conditions
- Landscaping Strategies
- Building Envelope
- Building Mechanical Systems
Sustainable Interiors
Brief Discussion on Historic Preservation and Green Retrofits

Readings
Chapter 3, ULI Textbook, pages 40–83.


Assignment
Complete assignment from Week 4.

Week 5
Managing the green retrofit process.

Topics
- Collaboration between Project Team Members
- Identifying a Strong Green Building Consultant
- Construction Considerations
- Minimizing Legal Risks in Green Design and Construction

Readings
Chapter 4, ULI Textbook. Pages 87–106.


Assignments
For the final project and presentation, identify a building in the Washington DC area and present a case study for a green building retrofit. Include a cost-benefit analysis. Also include a section that deals with marketing to and educating tenants on these new upgrades and how they will benefit from them. Extra credit will be given for identifying possible rebate and incentive programs and how a particular program can change the payback for specific upgrades.

Week 6
The business of green office renovations.

Topics
- Green Building Costs and Paybacks
- Leasing, Rental Rate, and Sales Price Benefits
- Strong Global Demand
- Restricted Supply and Premium Green Rents
- Underwriting Green Office Retrofits and Renovations
- Green Real Estate Finance Vehicles

Readings
Chapter 5, ULI Textbook. Pages 116–123.

Case Study: 545 Madison Avenue, ULI Textbook. Pages 208–218.

Assignment
Work on final project and presentation.
Week 7
Examine green property operations.

Topics
- Property Management Agreements, Leases, and Risk Management
- Green Operating Metrics
- Maintaining Energy-Efficient Operations
- Establishing Green Operating Programs
- Green Property Management Certification Programs

Readings
Chapter 6, ULI Textbook. Pages 140–158.

Assignment
Work on final project and presentation.

Week 8
Toward the future: new directions in green building.

Topics
- Building Information Modeling
- New Building Materials and Systems
- Smart Buildings and Smart Grids
- Buildings as Living Systems

Reading
Chapter 8, ULI Textbook. Pages 187–203.

Assignment
Final presentations and papers due.

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**Course Syllabus: Sustainable Design as a Core Business Strategy: Productivity and the Workplace**

The smoking gun in terms of the benefits of sustainability has always been in the productivity numbers. Although there are measurable reductions in utility costs due to energy and water efficiency, and there are a number of studies that point to increases in rental rates for LEED and/or ENERGY STAR rated buildings, these numbers are relatively low compared to potential gains in employee productivity, as well as the ability of these buildings to reduce turnover and sick time. This is because rent makes up about 8%–10% of businesses operating expenses, while people make up roughly 88%. Therefore, looking to save money on rent could potentially increase overall costs by not looking at how buildings impact the occupants. This course will examine a concept called return on rent, which looks at published studies and attempts to examine the concept of face rents versus effective rents based on a building’s ability to impact workers in terms of productivity, turnover, and sick days.

**Ongoing Assignment: Journal of the Built Environment**
Throughout history buildings were designed to create not just a sense of place but to instruct your senses on what kind of place you are in (e.g., a cathedral, an office building, hotel,
etc.). Today we seem mostly unaware of how these spaces and their design can impact us and our emotions. Your assignment throughout this course is to keep a journal of the spaces you visit. Notice their function, design, color palette, amount of darkness/light, and how you feel when you are inside. How clean is the space? Do you smell anything? What do you see? What would you change about these spaces if you could? What did you like? What elements would you incorporate into a building if you could? The idea is to reconnect with the built environment. Be creative.

Final Assignment
You are one of the top three brokerage firms seeking to win business from a developer known in the market to be the largest developer of green projects in your region. They are looking for a brokerage house that understands their business and focus on sustainability. In order to win their business you must develop a marketing plan for their new LEED Gold 200,000 SF downtown building. It is highly recommended that you use the financial benefits of green buildings to lure tenants into this building. It is also highly recommended that you be creative and think outside of the box, as this developer has long felt that broker understanding of the green market is very shallow. Make recommendations for marketing strategies that may be non-traditional, and very creative. It could include creating marketing boards, a video presentation for a website, sample advertisements, broker gifts, events, etc. Plan to be very aggressive in your presentation. A written marketing plan as well as a 15–20 minute presentation of recommendations is required.

You will be evaluated based on: (1) Overall marketing plan and quality of the write up. Organization, understanding of the problems and issues, comprehensiveness, accuracy, innovation and quality of material; and (2) The presentation organization, understanding of company issues, style, professionalism, creativity, and innovation.

Week 1
Introduction to return on rent.

Topics
Concept overview including a theoretical tenant
- Understanding Productivity and What Impacts Worker Productivity
- Understanding Costs of Corporate Recruiting and Training When Losing a Knowledge Worker
- Understanding the True Cost of an Employee

Reading

Assignment
Please come to class with the following information regarding the company you work for:
- Rent per square foot that your company currently pays, as well as how many square feet in the building. If you have a NNN lease, include the average operating expenses. If your company has multiple locations, select one office for purposes of this analysis.
- The number of employees that work within the office space above.
- Average cost per employee for the organization. If you work for a private company and this information is not available, make an informed guess.
- Your company’s factor for health insurance and overhead.
- Average number of sick days per employee.
- Average annual turnover for your organization.

If your company will not make this information available to you, do your own independent research based on average numbers for this market in terms of rent, knowledge worker salaries, sick days, and turnover.

**Week 2**
The factors that affect productivity.

**Topics**
Indoor Air Quality
- Impacts of IAQ During Construction and Operation of a Building
- How to Reduce or Eliminate These from a Work Environment
- The Effects of IAQ on Worker Productivity
- Sample Air Quality Tests

**Readings**

**Reference/Additional Reading**

**Week 3**
The factors that affect productivity.

**Topics**
Light and Lighting
- Qualities of Light and Their Effect on Human Physiology
- Types of Lighting and Their Effect on Productivity (natural, overhead, fluorescent, task)
- The Link between Daylight and Productivity

**Readings**

**Week 4**
The factors that affect productivity.

**Topics**
Thermal Comfort
Reading

Week 5
Corporate values.

Topics
How Corporate Social Responsibility and Shared Values Impact Employee Retention and Turnover

Readings

Week 6

Topics
Costs of Training and Development of Knowledge Workers

Readings

Week 7

Topics
- Building Operations: Expenses and Management Responsiveness to Issues
- Beyond Green Buildings: Can Architecture Impact Worker Health and Productivity

Readings

Week 8

Topics
Final paper and presentations.
Course Syllabus: Reimagining a City: Sustainable Community Development

“Today, more than any time in history, we live in a global economy where quality of place drives the free flow of capital. And the lines between urban, suburban, and rural challenges blur from poverty to housing affordability, strong neighborhoods are increasingly becoming a yardstick with which we measure America’s success.” Shaun Donovan, Secretary of the U.S. Department of Housing and Urban Development.

When Thomas Friedman released his book *The World is Flat* in 2005, he wrote how technology was making developing nations economically competitive, and that outsourcing jobs to other countries will help raise their standard of living and increase their demand for American goods and services; ultimately creating a global country of mutual economic dependency. The book provides an excellent example of the interconnectivity of people and our mutual dependence on each other. Although Friedman was talking primarily about goods and services, understanding the concept of interconnectedness is paramount to understanding the concept of sustainable development and the local community’s effect and ultimate impact on the larger global community.

This course will focus on the core concepts of green community development, examining issues of density and transportation, conservation and preservation, energy and resources, and the health and sustainability of local and global communities.

Recommended Textbooks
*Green Community*. Edited by S. Piedmont-Palladino and T. Mennel.


Final Assignment
A 10-page term paper on either (1) a pure theory paper about some aspect of the human/nature relationship in the Western intellectual tradition, or (2) a public policy paper on a contemporary environmental issue and a solution to that issue using course materials. The presentation should be ten minutes long. In the presentation you should give a synopsis of your paper. PowerPoint is optional but not required.

Week 1
The green community in context.

Topics
- Putting Contemporary Problems into A Global Context
- A History of Sustainability and What We Can Learn from Designs of the Eighteenth and Nineteenth Centuries
- How Technology Impacted Design in the Twentieth Century
- Personal, Economic, and Social Benefits of Well-planned/Designed Dense Neighborhoods

Readings


Grassroots, Chapter 1. Do American’s Favor Environmental Protection.

Assignments
Write a two-page memo on the following: What aspects of personal space and design are most important to you? What excites you/concerns you about the concept of densely-designed mixed-use neighborhoods? Would you want to live there? Specifically whether you feel there is an inherent conflict between the ideologies of green communities versus people’s desire to actually live there. What are the positive and negative aspects?

Week 2
The aspects of density and transportation.

Readings
Green Communities. Introduction to Connectivity. F. Hansen.
Grassroots. Chapter 2, How Deep is the Public Commitment to the Environment?

Assignment
Write a two-page memo on the following: What aspects of your daily life are currently causing environmental pollution? Think about how you dispose of your garbage. Do you sort your recycling? How do you get to work, to school, or into town to socialize with friends? Do you take a bus? Do you drive a car? And what products do you use to clean your house? To store your groceries? What groceries do you buy? How much impact do you make on the world?

Week 3
The aspects of land conservation and preservation are discussed.

Topics
- Green Communities and the Redefining of Community Wealth
- Managing/Controlling Development to Build Green Communities
- Regulation vs. Incentive
- How Land Conservation Policies Have Changed Through Time and Changing Political Environments

Readings
Grassroots. Chapter 3, Have Environmental Attitudes Changed Over Time?

Assignment
Write a two-page memo on the following: Examine your life as it exists today and tell whether or not there are any modifications you could make that would have a positive impact on the environment. Don’t say “join the Sahara Club” or some other local interest group. Include ways to achieve the exact same life, with less negative impact. Be interesting and realistic.

Week 4
Examine energy and resources.
Topics
- Local Sustainable Energy Sources
- Energy and Communities
- How Attitudes Towards These Issues Change Over Time

Readings
Grassroots, Chapter 5, *Are Environmental Attitudes Inconsistent*?

Assignment
Present an annotated bibliography of at least 10 sources, as well as a term paper topic overview of 150 words stating in clear, concise terminology your intended topic, and outline in general terms your strategy for arguing your point.

Week 5
Discussion of local and global health.

Topics
- Public Health, Climate Change, and the Built Environment
- Is Environmentalism Elitist

Readings
Green Community. *Healthy Communities, Green Communities*. H. Frumkin. Pages 118–120.
Grassroots. Chapter 4, *Is Environmentalism Elitist*?

Week 6
Discussion of local and global health.

Topics
- Food and Community Greening
- Growing Crops for Biofuel

Readings

Week 7
A discussion of the consumer, the marketplace, and environmentalism.
Topics
- Elections and the Environment
- Motivating the Citizen Consumer
- Rethinking the Strategy of Environmental Communication

Readings
Grassroots. Conclusion: *Rethinking Environmentalism.*

Week 8
Final papers are due. Presentations and course review.

Conclusion
This discussion represents the beginning of a conversation on the present state of graduate business education within the framework of sustainability as a driver of corporate value. It also lays out a foundation for the near future in terms of enhancing our systems-based thinking to produce more dynamic young leaders. Today’s graduate business students must be equipped to face the challenges of profitability in a business environment with new resource constraints, new government regulations, and new methods of accounting for production costs and profits.

Businesses need to evolve beyond basic concepts of corporate social responsibility and identify profit centers focused on new technologies, new manufacturing processes, new building practices, and new financial models. They must be ready to educate, renovate, and reinvent the entire value chain, and send a message to our government and the world that we are prepared to take a leadership role in the next industrial revolution that will be efficient, smart, clean, and green.

Endnotes
1 The rankings are compiled on a yearly basis. www.businessweek.com/bschools/rankings/.
2 Beyond Grey Pinstripes 2009–2010: Preparing MBAs for Social and Environmental Stewardship. Published by the Aspen Institute Center for Business Education.
6 http://www.stanford.edu/group/fusion/cgi-bin/site/social-m-challenge/.
7 http://csi.gsb.stanford.edu/education-programs.


http://mba.yale.edu/news_events/CMS/Articles/6708.shtml.

http://www.kenan-flagler.unc.edu/Programs/MBA/Academics/casestuaccomplish.cfm.


http://www4.gsb.columbia.edu/realestate/research/housingcrisis/resources.


http://nicholas.duke.edu/csi/overview.html.

http://nicholas.duke.edu/institute/about.html.

http://www.fuqua.duke.edu/edge.


http://business.nd.edu/Ask_More/Integrated_Curriculum/More_Courses/#mbacourses, Ten Years Hence.


http://mba.tuck.dartmouth.edu/initiative/.


http://business.gwu.edu/grad/mba_comp_chart.html.


Marnie L. Abramson, NextGen Partners, LLC, Rockville, MD 20852 or marnie@nextgenpartners.net.