

Last updated: October 29<sup>th</sup>, 2007

**SUSTAINABILITY: CHALLENGES AND RESPONSES  
ES/SO350**

**DESCRIPTION:**

*"We cannot solve our problems with the same thinking we used when we created them."*

- Albert Einstein

Sustainability is widely regarded as one of the key challenges facing humanity in the new millennium. Having achieved great success in attaining prosperity for a large proportion of mankind through industrial development, the consequences of unfettered growth have begun to catch up with us. A diverse array of crises has begun to make itself felt, threatening many of the environmental and social support systems we take for granted.

The course comprises two main sections. In the first section, we will examine the tremendous challenges that we face, all around the globe. We will identify key problem areas, recognise their consequences, and attempt to understand the reasons for their persistence. Using a holistic perspective based on systems analysis, we will emphasize the interconnectedness between various spheres of social, environmental and economic systems. In the second section, we will survey various policies, technologies and social initiatives that may help us change course to a more promising and fulfilling future.

**PREREQUISITES:**

None

**LANGUAGE OF PRESENTATION:**

English

**PROFESSOR:**

D. ETZION

**STUDENT OUTCOMES:**

By the end of the course students will be able to:

- recognize the fundamental principles of social, environmental and economic sustainability;
- identify problem areas where unsustainable practices are prevalent and destructive;
- analyze complex problems utilizing the precepts of systems analysis;
- apply a critical sustainability lens to current events; governmental and inter-governmental policy, and; other institutions of modern life;
- reflect on their own values regarding a sustainable life-style, and perhaps integrate meaningful sustainable practices in their lifestyle

**LEARNING MEANS:**

- **LECTURES:** Delivery of core course content.
- **CLASS DISCUSSION:** Sustainability spans scientific knowledge and personal belief systems. Class discussion enables us to probe the validity and strength of scientific knowledge and argumentation, as well as analyze how our thought processes and behavioural patterns are influenced by, and in turn influence, various sustainability practices
- **READER:** Key texts designed to develop general understanding of the subject matter and foment discussion. The readings listed for a particular session must be completed BEFORE coming to class that day.
- **ANALYSIS:** Rudimentary system diagrams are a powerful tool for identifying mechanisms of cause and effect, interaction and feedback. By preparing system diagrams for class, students will be able to better understand key aspects of sustainable and unsustainable action.
- **GUEST PRESENTATIONS:** Delivered by people working in the sustainability arena, these presentations will provide participants a glimpse of real-life sustainability-oriented activity
- **FIELD TRIPS:** Field trips enable experiential learning of innovative technologies and practices relating to sustainability, as manifested in the city of Barcelona
- **CLASS PROJECT:** Over the duration of the course, we will conduct a sustainability audit of IES, identify non-sustainable practices, and develop a plan to implement alternative, more sustainable practices to replace them. This project will be pursued by the class in its entirety, and will be self-managed

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**METHODS OF ASSESSMENT:**

The final grade will be determined as follows:

CLASS PARTICIPATION: 20%

MID-TERM EXAM: 20%

TERM PAPER: 25%

ASSIGNMENTS: 20%

CLASS PROJECT: 15%

- CLASS PARTICIPATION: I will need your cooperation to make our time together interesting and beneficial for us all. This shouldn't be too hard, since sustainability is not a dogmatic topic, and it begs for discussion and analysis. I will challenge you to closely examine many assumptions, and to think critically about the concepts, tools and practices we will discuss in class.
- ASSIGNMENTS: Homework (assigned only for certain sessions) provides an effective means for translating reading assignments into knowledge, by transforming text into graphical interpretations of processes called systems diagrams. These succinct models link various issues not always viewed as interrelated, and provide a fresh analytical perspective on the topics being studied.
- MID-TERM EXAM: The exam will assess students' knowledge of the basic obstacles to sustainability covered in the first section of the course.
- TERM PAPER: The topic of the term paper will be determined jointly with the professor. If at all possible, students will be asked to write a paper which integrates sustainability concepts with their major (or minor) in college. If this is not feasible, students can choose an issue of personal interest to them.
- CLASS PROJECT: An assessment of the efforts and outcomes of the IES sustainability project undertaken by the class.

**COURSE CONTENT**

SESSION 1	Jan. 21, 2008	<p><b>Class content:</b> What IS sustainability, anyway?</p> <p><b>Required readings:</b> None</p>
SESSION 2	Jan. 23, 2008	<p><b>Class content:</b> Systems Thinking: A Primer</p> <p><b>Required readings:</b> Capra, Fritjof, Ecology and Community (10 pages). Available: <a href="http://www.ecoliteracy.org/publications/pdf/community.pdf">http://www.ecoliteracy.org/publications/pdf/community.pdf</a>. Accessed: 20 April 2007. Senge, Peter M., Kleiner, A., Roberts, C., Ross, R. &amp; Smith, B. (1994). <i>The Fifth Discipline: The Art and Practice of the Learning Organization</i>. New York: Currency (Ch. 16-17, pages 108-123).</p>
SESSION 3	Jan. 28, 2008	<p><b>Class content:</b> The Human Factor: Demographics and Social Trends</p> <p><b>Required readings:</b> Brown, L.R. (2006). <i>Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble</i>. Norton, W. W. &amp; Company, Inc. (Ch. 6, p.99-120).</p>
SESSION 4	Jan. 30, 2008	<p><b>Class content:</b> Climate Change</p> <p><b>Required readings:</b> None</p>
SESSION 5	Feb. 4, 2008	<p><b>Class content:</b> Water: An Increasingly Scarce Resource</p> <p><b>Required readings:</b> Brown, Lester R. (2006). <i>Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble</i>. Norton, W. W. &amp; Company, Inc. (Ch. 3, p.41-58)</p>
SESSION 6	Feb. 6, 2008	<p><b>Class content:</b> Energy: Trends, Mega-Trends and their Implications</p> <p><b>Required readings:</b> World Business Council for Sustainable Development (2005) <i>Pathways to 2050: Energy and Climate Change</i> (15 pages).</p>
SESSION 7	Feb. 11, 2008	<p><b>Class content:</b> GUEST SPEAKER: Clean Technology</p> <p><b>Required readings:</b> World Business Council for Sustainable Development (2006). <i>Powering a Sustainable Future</i> (24 pages).</p>

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SESSION 8	Feb. 13, 2008	<p><b>Class content:</b> Agriculture: Our Relationship with the Land</p> <p><b>Required readings:</b> Norse, David (2003). Agriculture and the Environment: Changing Pressures, Solutions and Trade-offs. In Bruinsma, J. (ed.) <i>World Agriculture: Towards 2015/2030 - An FAO Perspective</i>: 331-356 Earthscan, London.</p>
SESSION 9	Feb. 18, 2008	<p><b>Class content:</b> Forests, Fisheries and Disappearing Species</p> <p><b>Required readings:</b> Brown, Lester R. (2006). <i>Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble</i>. Norton, W. W. &amp; Company, Inc. (Ch. 5, p.79-98)</p>
SESSION 10	Feb. 20, 2008	<p><b>Class content:</b> Environmental Systems, Social Systems and Human Health</p> <p><b>Required readings:</b> World Health Organization (2005). <i>Ecosystems and Human Well-Being Health Synthesis</i>, (Overview, pages 1 - 10) Ewing, David (2006). The Pollution Within. <i>National Geographic</i> (7 pages) Available: <a href="http://www7.nationalgeographic.com/ngm/0610/feature4/index.html">http://www7.nationalgeographic.com/ngm/0610/feature4/index.html</a>. Accessed: 29 October 2007.</p>
SESSION 11	Feb. 25, 2008	<p><b>Class content:</b> Sustainability and Social Justice</p> <p><b>Required readings:</b> Massey, R. (2004) <i>Environmental Justice: Income, Race, and Health</i>. Global Development And Environment Institute, Tufts University (17 pages). Capra, Fritjof, Development and Sustainability (4 pages). Available: <a href="http://www.ecoliteracy.org/publications/pdf/CEL-Fritjof-Capra-Development.pdf">http://www.ecoliteracy.org/publications/pdf/CEL-Fritjof-Capra-Development.pdf</a>. Accessed: 20 April 2007.</p>
SESSION 12	Feb. 27, 2008	<b>MID-TERM EXAM</b>
SESSION 13	Mar. 3, 2008	<p><b>Class content:</b> Ecological Economics</p> <p><b>Required readings:</b> Goodwin, N, Nelson J.A., Ackerman, F., Weisskopf, T. (2004). <i>Economics in Context: Goals, Issues, and Behavior</i>. Global Development And Environment Institute, Tufts University (25 pages)</p>
SESSION 14	Mar. 5, 2008	<p><b>Class content:</b> GUEST SPEAKER: Fair trade</p> <p><b>Required readings:</b> To be distributed</p>
SESSION 15	Mar. 10, 2008	<p><b>Class content:</b> Policy, Regulations, Incentives and Voluntary Programs for Sustainability</p> <p><b>Required readings:</b> Brown, Lester R. (2006). <i>Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble</i>. Norton, W. W. &amp; Company, Inc. (Ch. 7, p.123-141)</p>

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SESSION 16	Mar. 12, 2008	<p><b>Class content:</b> Urban Planning and Architecture</p> <p><b>Required readings:</b> Brown, Lester R. (2006). <i>Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble</i>. Norton, W. W. &amp; Company, Inc. (Ch. 11, p.204-224).</p>
	SPRING BREAK	
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SESSION 17	Mar. 24, 2008	BANK HOLIDAY: NO CLASS
SESSION 18	Mar. 26, 2008	<p><b>Class content:</b> Sustainable Transportation</p> <p><b>Required readings:</b> Hawken, Paul, Lovins, Amory &amp; Lovins, L. Hunter (1998) <i>Natural Capitalism: Creating the Next Industrial Revolution</i>. Back Bay Books : Boston (Ch.2, p.22-47).</p>
SESSION 19	Mar. 31, 2008	<p><b>Class content:</b> FIELD TRIP – TMB's Hydrogen Bus</p> <p><b>Required readings:</b> None</p>
SESSION 20	Apr. 2, 2008	<p><b>Class content:</b> Design, Re-Design and New Industrial Paradigms</p> <p><b>Required readings:</b> McDonough, William &amp; Braungart Michael (2000). A World of Abundance. <i>Interfaces</i> <b>30</b>(3): 55-65. Lovins, Amory B., Lovins, L. Hunter &amp; Hawken, Paul (1999). A Road Map for Natural Capitalism. <i>Harvard Business Review</i>, <b>77</b>(3): 145-158.</p>
SESSION 21	Apr. 7, 2008	<p><b>Class content:</b> Business and Sustainable Development</p> <p><b>Required readings:</b> Senge, Peter &amp; Carstedt, Goran (2001) Innovating Our Way to the Next Industrial Evolution. <i>Sloan Management Review</i>, <b>42</b>(2): 24-38.</p>
SESSION 22	Apr. 9, 2008	<p><b>Class content:</b> Local Community Networks</p> <p><b>Required readings:</b> Shuman, Michael (2006) , <i>The Small-Mart Revolution</i>. San-Francisco: Berrett-Koehler (Ch. 2, p.39-62). Wheeler, David, et al. (2005) Creating Sustainable Local Enterprise Networks. <i>Sloan Management Review</i>, <b>47</b>(1): 33-40.</p>
SESSION 23	Apr. 14, 2008	<p><b>Class content:</b> An Urban Farm</p> <p><b>Required readings:</b> None</p>

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SESSION 24	Apr. 16, 2008	<p><b>Class content:</b> Individual Choices (How YOU Can Make a Difference)</p> <p><b>Required readings:</b> On the web:</p> <ul style="list-style-type: none"> <li>• The Union of Concerned Scientists (<a href="http://www.ucsusa.org">www.ucsusa.org</a>)</li> <li>• Natural Resources Defense Council (<a href="http://www.nrdc.org/action/tips.asp">http://www.nrdc.org/action/tips.asp</a>)</li> <li>• Lifestyles of Health and Sustainability (<a href="http://www.lohas.com">www.lohas.com</a>)</li> </ul>
FINAL EXAM*	Apr. 21, 2008	<b>Presentation of Class Project and Submission of Final Paper</b>

**LIST OF SELF-GUIDED VISITS, FIELD STUDIES, CLASSES ON SITE, GUEST SPEAKERS OR FILM VIEWINGS**

SESSION	DATE	ACTIVITY	DESCRIPTION
4	Jan. 30, 2008	Film viewing	An Inconvenient Truth
8	Feb. 11, 2008	Guest Speaker	Clean Technologies
15	Mar. 5, 2008	Guest Speaker	Fair Trade
19	Mar. 31, 2008	Class on site	A Hydrogen Bus
23	Apr. 14, 2008	Class on site	Agriculture within the City

**REQUIRED READINGS**

Brown, L.R. (2006). *Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble*. Norton, W. W. & Company, Inc.

Capra, Fritjof, Development and Sustainability. Available: <http://www.ecoliteracy.org/publications/pdf/CEL-Fritjof-Capra-Development.pdf>. Accessed: 20 April 2007.

Capra, Fritjof, Ecology and Community. Available: <http://www.ecoliteracy.org/publications/pdf/community.pdf>. Accessed: 20 April 2007.

Ewing, David (2006). The Pollution Within. *National Geographic*. Available: <http://www7.nationalgeographic.com/ngm/0610/feature4/index.html>. Accessed: 29 October 2007.

Goodwin, N, Nelson J.A., Ackerman, F., Weisskopf, T. (2004). *Economics in Context: Goals, Issues, and Behavior*. Global Development And Environment Institute, Tufts University

Hawken, Paul, Lovins, Amory & Lovins, L. Hunter (1998) *Natural Capitalism: Creating the Next Industrial Revolution*. Back Bay Books : Boston (Ch.2).

Lovins, Amory B., Lovins, L. Hunter & Hawken, Paul (1999). A Road Map for Natural Capitalism. *Harvard Business Review*, **77**(3): 145-158.

Massey, R. (2004) *Environmental Justice: Income, Race, and Health*. Global Development And Environment Institute, Tufts University

McDonough, William & Braungart Michael (2000). A World of Abundance. *Interfaces* **30**(3): 55-65.

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- Senge, Peter & Carstedt, Goran (2001) Innovating Our Way to the Next Industrial Evolution. *Sloan Management Review*, **42**(2): 24-38.
- Senge, Peter M., Kleiner, A., Roberts, C., Ross, R. & Smith, B. (1994). *The Fifth Discipline: The Art and Practice of the Learning Organization*. New York: Currency (Ch. 16-17, pages 108-123).
- Shuman, Michael (2006). *The Small-Mart Revolution*. San-Francisco: Berrett-Koehler (Ch. 2)
- Wheeler, David, et al. (2005) Creating Sustainable Local Enterprise Networks. *Sloan Management Review*, **47**(1): 33-40.
- World Business Council for Sustainable Development (2005) *Pathways to 2050: Energy and Climate Change*.
- World Business Council for Sustainable Development (2006). *Powering a Sustainable Future*.
- World Health Organization (2005). *Ecosystems and Human Well-Being Health Synthesis, (Overview)*

#### RECOMMENDED READINGS

- Brower, Michael & Leon, Warren (1999). *The Consumer's Guide to Effective Environmental Choices: Practical Advice from the Union of Concerned Scientists*. Three Rivers Press.
- Capra, Fritjof (2004). *The Hidden Connections: A Science for Sustainable Living*. Anchor.
- Carson, Rachel (1964) *Silent Spring*. Crest
- Cobb, John. & Daly, Herman E. (1997) *For the Common Good*. Beacon Press.
- Diamond, Jared (2004). *Collapse: How Societies Choose to Fail or Succeed*. Viking
- Dr. Seuss (1971). *The Lorax*. Random House.
- Frankel, Carl (1998). *In Earth's Company: Business, Environment, and the Challenge of Sustainability*. Conscientious Commerce.
- Hawken, Paul (1993). *The Ecology of Commerce: A Declaration of Sustainability*. Collins.
- Leopold, Aldo (1968) *A Sand County Almanac*. Oxford University Press.
- Quinn, Daniel (1992) *Ishmael: An Adventure of the Mind and Spirit*. Bantam/Turner.
- Schumacher, E.F. (1973). *Small Is Beautiful: Economics as if People Mattered*. Harper-Collins.