

University of California, San Diego
School of Global Policy and Strategy
IRGN 453: Sustainable Development
Winter 2016

Time: Tu/Th 3:30p-4:50p

Location: RBC 1301

Instructor: Junjie Zhang, RBC 1303, (858) 822-5733, junjiezhang@ucsd.edu

Office Hour: Wednesdays 2:00-4:00 pm

Course Description: This course consists of two parts. First, we will discuss conceptual issues in sustainable development. The primary objective is to formalize conceptions of sustainability and thus provide a foundation for management decisions. Second, we will apply the theoretical framework to optimal management of environment and natural resources. The intended audience is MPIA students with a particular interest in sustainability. Preparations in calculus and intermediate microeconomics are recommended but not required.

Readings: No textbook is required. Most readings are available online, otherwise they will be distributed before class.

Course Format: The course will be run as a combination of lectures, debates, simulations, and presentations. Thus active student participation is expected. For lecture sessions, the instructor will present basic materials on each topic. For discussion sessions, the class will study the designated readings with discussion leaders.

Grading: The course will be a combination of lectures by the instructor and discussions by students. Thus, attendance at class meetings is mandatory. The course grade will be based 10% on classroom participation, 30% on a group project, 40% on final project, and 20% on final presentation. The topic of the final project should be negotiated with the instructor.

Term Paper Instructions: Each student is required to submit a paper on a research topic relevant to the course materials. The paper may be empirical or conceptual as long as it is creative. Literature reviews are acceptable if they are interpretive. The paper should be no longer than 20 pages (exclusive of figures, tables and references). The paper should include a clear problem and objectives statement, review of relevant literature and analysis of the problem. All information or arguments drawn from the literature should be carefully cited. Time will be allotted at the end of the quarter for each student to make an oral presentation. The complete paper should be submitted before 5:00 pm on March 13, 2016.

Academic Integrity: Student conduct related to this course is governed by the UCSD Policy on Integrity of Scholarship: "Students are expected to complete the course in compliance with the instructor's standards. No student shall engage in any activity that involves attempting to receive a grade by means other than honest effort."

Week 1: Introduction

January 5, 2016: Introduction and logistics

January 7, 2016: A brief history of sustainable development

- * Tierney, John, "Economic Optimism? Yes, I'll Take That Bet." *New York Times*, December 27, 2010. <http://www.nytimes.com/2010/12/28/science/28tierney.html>
- * Wade, Nicholas, "In Dusty Archives, a Theory of Affluence." *New York Times*, August 7, 2007. <http://www.nytimes.com/2007/08/07/science/07indu.html>
- * Justin Lahart, Patrick Barta and Andrew Batson, "New Limits to Growth Revive Malthusian Fears", *Wall Street Journal*, March 24, 2008. <http://online.wsj.com/article/SB120613138379155707.html>

Week 2: Dynamics and discounting

January 12, 2016: Principles of dynamics

January 14, 2016: Discounting

- * Schelling, T.C.1995. "Intergenerational discounting." *Energy Policy* 23: 395-401.
- OMB (Office of Management and Budget). 1992. Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs. OMB Circular A-94. Washington, D.C.

Week 3: Sustainability

January 19, 2016: Sustainability indicators

January 21, 2016: Framework of sustainability

World Commission on Environment and Development, 1987. *Our Common Future*. Oxford: Oxford University Press. <http://www.un-documents.net/wced-ocf.htm>

Arrow, K.; Dasgupta, P.; Goulder, L.; Daily, G.; Ehrlich, P.; Heal, G.; Levin, S.; Maler, K.-G.; Schneider, S.; Starrett, D. & Walker, B. 2004. "Are We Consuming Too Much?" *The Journal of Economic Perspectives* 18: 147-172.

Bossell, Hartmut, ed. 1999. *Indicators for Sustainable Development: Theory, Method, Applications: A Report to the Balaton Group*, Winnipeg, Canada: International Institute for Sustainable Development (IISD). <http://www.iisd.org/pdf/balatonreport.pdf>

Week 4: Cost-benefit analysis

January 26, 2016: Cost-benefit analysis

January 28, 2016: Individual project field study (no class)

You are asked to conduct a cost-benefit analysis on a sustainability project on campus. For a complete list, please visit: <http://sustainability.ucsd.edu/>. You are expected to interview project managers or visit the site to obtain the first-hand information of investment and operational costs.

Week 5: Environmental valuation

February 2, 2016: Stated Preference

February 4, 2016: Revealed Preference

Week 6: Policy memo presentation

February 9, 2016: Group 1

February 11, 2016: Group 2

The class will be divided into 10 groups working on a policy memo on the application of the existing sustainability indicators to the real policy making. Each group is required to submit a 10-page double-spaced paper before presentation. The contribution of each student needs to be specified explicitly. The major findings will be presented on class. Each group has 10 minutes for presentation and answering questions. Please sign up online: <http://goo.gl/NWEYy>

Week 7: Non-renewable resources

February 16, 2016: Economics of non-renewable resources

February 18, 2016: Topics of non-renewable resources

Solow, Robert M. "The Economics of Resources or the Resources of Economics." *The American Economic Review*, 1974, 64(2), pp. 1-14.

Krautkraemer J., and M. Toman. 2003. "Fundamental Economics of Depletable Energy Supply." Resources for the Future, Discussion Paper 03-01.
<http://www.rff.org/Documents/RFF-DP-03-01.pdf>

- * Livernois, J., "On the Empirical Significance of the Hotelling Rule." *Review of Environmental Economics and Policy* 3(1):22-41
- * Shantayanan Devarajan and Anthony C. Fisher, 1981. "Hotelling's "Economics of Exhaustible Resources": Fifty Years Later." *Journal of Economic Literature* 19(1): pp. 65-73
- * Kenneth S. Deffeyes. *Hubbert's Peak: The Impending World Oil Shortage*, Chapter 1. Princeton University Press, 2001.
<http://press.princeton.edu/chapters/s8845.pdf>

Week 8: Renewable resources

February 23, 2016: Economics of renewable resources

February 25, 2016: Optimal management of renewable resources

Clark, C.W., 1973. "The Economics of Overexploitation," *Science* 181: 630-634.

- * Brown, Gardner M., 2000. "Renewable Natural Resource Management and Use without Markets." *Journal of Economic Literature* 38(4):875-914.

Wilen, James E., 2000. "Renewable Resource Economists and Policy: What Differences Have We Made?" *Journal of Environmental Economics and Management* 39:306-327.

Smith, M.D., J. Zhang and F.C. Coleman. 2006. "Effectiveness of Marine Reserves for Large-Scale Fisheries Management," *Canadian Journal of Fisheries and Aquatic Sciences* 63(1): 153-164.

Week 9: Special topics

March 1, 2016: Topics in natural resource management

March 3, 2016: Biodiversity

- * Sanchirico, J.N., M.D. Smith, and D.W. Lipton. 2007. "Managing Fish Portfolios," *Resources, Winter*, 2007.
- * Costello, C., S. Gaines and J. Lynham. 2008. "Can catch shares prevent fisheries collapse?" *Science* 321: 1678-1681.

Weitzman, M.L., 1998. "The Noah's Ark Problem," *Econometrica* 66(6): 1279-1298.

Pimm, S.L., G.J. Russell, J.L. Gittleman, and T.M. Brooks, 1995. "The Future of Biodiversity," *Science* 269: 347-350.

Polasky, S. et. al. 2008. "Where to put things? Spatial land management to sustain biodiversity and economic returns," *Biological Conservation* 141(6): 1505-1524

Week 10: Individual project presentations

March 8, 2016: Session 1

March 10, 2016: Session 2

- Sign-up sheet <http://goo.gl/jr31L>

* designates the papers for discussion