

Professor William N. Rom M.D., MPH

Office time Thursdays 3-5 P.M. Puck 3045

Class time Thursdays 6-8 PM Room: Silver 706

Course Description

This course is an introduction to major environmental policy issues and examines the role of government in the control of environmental exposures. An important focus of the course is an assessment of the role of policy analysis in the formation and implementation of national and local environmental policy. The course covers the legal basis for environmental action from the beginnings of The Clean Air Act, The Wilderness Act, the National Environmental Policy Act, Endangered Species Act to international treaties. The sources of pollution and threats to environmental integrity are scrutinized in detail. Consequences of pollution on the environment and health are considered. Potential policy alternatives for solutions are discussed. Importantly, the health studies including epidemiology, human exposures, animal models, and in vitro cell studies are reviewed. Science-based environmental regulation versus cost-benefit scenarios and advocacy by regulated industry and public health organizations are highlighted. The course covers air pollution, global warming and land use with an emphasis on wilderness protection.

Course Requirements/Grading

Four papers (8-10 pages) and are required. Each paper is 25% of the final grade except for paper 2 which is 20% allowing 5% for class participation. See pages 9-10 below for a more detailed description of the papers and due dates. Class discussion and debate are integral to the course. There is no midterm or final exam.

Students are expected to have studied the assigned readings. All of the readings are journal articles that are available directly online. The textbook for the course is Environmental and Occupational Medicine 4th Edition published by Lippincott Williams Wilkins 2007. Some readings for guest lecturers or materials that are not copyright protected will be handed out in class or will be posted on the course blackboard site. All reading materials are also on reserve at Bobst Library. Copies of PowerPoint/overhead materials used in class will be posted on the blackboard site at least 24 hours in advance of the class.

If you have questions about the reading materials or you need other help, please contact my administrative assistant, Jean-Anne McKiernan [Bellevue Hospital – 7th Floor - 212-263-6479 mckiej02@med.nyu.edu].

Office Hours

By appointment (212-263-6479) – William.Rom@med.nyu.edu

Bellevue Hospital 7th Floor Chest Service or 295 Lafayette Street Puck 3045 Thursday 3-5 P.M.

Session 1 – Jan 24. The Clean Air Act

- Description of course content, goals, and requirements
- Clean Air Act: Primary Air Pollutants and National Ambient Air Quality Standards

- Prevention of Significant Deterioration, New Source Review, State Implementation Plans

Required reading:

Greenbaum, DS, JD Bachmann, D Krewski, JM Samet, R White, and RE Wyzga. Particulate air pollution standards and morbidity and mortality: case study. *Am J Epidemiol* 2001;154:S78-S90.

Greenbaum DS. Clean Air Act. Chapter 108 in Rom WN Ed., *Environmental and Occupational Medicine* 4th Ed, Philadelphia, PA, 2007.

Session 2 – Jan 31 Particulate Matter PM

- Sources, concentration, and exposure; composition
- Short-term health effects-epidemiology and time-series
- Long-term health effects-cardiovascular, cancer

Required reading:

Vedal S and Sullivan JH. Particulate Matter. Chapter 100 in Rom WN, Ed in *Environmental and Occupational Medicine* 4th Ed, Philadelphia, PA., 2007.

Pope CA, 3rd, Burnett RT, Thun MJ, et al. Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. *JAMA* 2002;287:1132-41.

Gauderman WJ, Avol E, Gilliland F, et al. The effect of air pollution on lung development from 10 to 18 years of age. *N Engl J Med* 2004;351:1057-67.

Bell ML, Samet JM, Domenici F. Time-series studies of particulate matter. *Annu Rev Public Health* 2004; 25: 247-280.

Domenici F, Peng RD, Bell ML, et al. Fine particulate air pollution and hospital admission for cardiovascular and respiratory diseases. *JAMA* 2006; 295: 1127-34.

Sun QS, Wang A, Jin X, et al. Long-term air pollution exposure and acceleration of atherosclerosis and vascular inflammation in an animal model. *JAMA* 2005; 294: 3003-10.

Session 3 – Feb 7 SO₂ and Acid Rain

- Sources, exposures, mixtures
- Health effects: epidemiological and clinical
- Environmental effects of biota
- Control strategies: Cap and trade

Required reading:

Utell M and Frampton M. SO_x. Chapter 99 in Rom WN, Ed., *Environmental and Occupational Medicine* 4th Ed, Philadelphia, PA., 2007.

Weathers KC, Likens GE, Butler TJ, and Elliott A. Chapter 101 in Rom WN, Ed., *Environmental and Occupational Medicine*, Philadelphia, PA, 2007.

Session 4 – – Feb 14 Air Toxics, Lead and Mercury Guest Lecturer (Leo Trasande MD, MS).

- Hazardous Air Pollutants (22 out of 188).
- Key Pollutants: Benzene, 1,3 butadiene, formaldehyde, POMs, acrolein, acetaldehyde, and naphthalene.
- Lead: organic lead compounds and re-formulated gasoline.
- Mercury: coal-fired power plant emissions and bioaccumulation in the food chain.

Required reading:

Health Effects Institute Report on Mobile Source Air Toxics, in press.

Fischbein A and Hu H. Occupational and Environmental Exposure to Lead. Chapter 61 in Rom WN, Ed., Environmental and Occupational Medicine, 4th Ed., Philadelphia, PA, 2007.

Goldman L. Mercury. Chapter 62 in Rom WN, Ed., Environmental and Occupational Medicine, 4th Ed., Philadelphia, PA, 2007.

Session 5 – Feb 21 Transportation and Ozone

- Formation of Ozone, exposures
- Acute effects on airway hyperresponsiveness; effects on asthma in epidemiological studies
- Chronic health effects including COPD and mortality
- Control strategies, the players, and regulatory activities including response to uncertainty

Required reading:

Lippmann M. Ozone. Chapter 97 in Rom WN, Ed., Environmental and Occupational Medicine, 4th Ed, Philadelphia, PA., 2007.

Bell ML, McDermott A, Zeger SL, et al. Ozone and short-term mortality in 95 U.S. urban communities, 1987-2000. JAMA 2004; 292:2372-2378.

Session 6-- Feb 28 Cigarette Smoking and Environmental Tobacco Smoke

- Prevalence of smoking. Toxicology of cigarette smoke.
- Health effects of active smoking.
- Environmental tobacco smoke.
- Interactions.
- Control strategies.

Required reading:

Samet J and Hecht SS. Cigarette Smoking. Chapter 102 in Rom WN, Ed., Environmental and Occupational Medicine, 4th Ed., Philadelphia, PA, 2007.

Optional reading:

US Department of Health and Human Services (USDHHS). The health effects of active smoking: A report of the Surgeon General. 2004. Washington, D.C., U.S. Government Printing Office.

Session 7 – March 6 Global Warming: Science and Consequences

- CO2 and Greenhouse gases measurements, trends, and surface temperatures.
- Impacts of polar and glacial ice-direct consequences on water supplies.
- Impacts on wildlife and plant life.
- Weather impacts-storms, droughts, and heat waves.
- Medical aspects.

Required Reading:

Epstein PR. Global Warming. Chapter 105 in Rom WN, Ed., Environmental and Occupational Medicine 4th Ed., Philadelphia, PA., 2007.

Session 8 – March 13 Global Warming: A National Energy Plan.

- Discussion of U.S. energy utilization-oil, gas, coal, nuclear, and hydro.
- Discussion of wind energy and siting disputes.
- Solar energy technology.

- Biofuels and hybrid automobiles.
- Discussion of federal programs to stimulate utilization of alternative forms of energy.

Required Reading:

Ending the energy stalemate: a bipartisan strategy to meet America's energy challenges. The National Commission of Energy Policy, Washington, D.C., December 2004.
www.energycommission.org

March 20 Spring Break

Session 9—March 27 Global Warming: Advocating Solutions; Kyoto, McCain-Liebrman

Discussion of Clean Coal Technologies including coal gasification and sequestration.

Required reading:

Agenda for climate action. Pew Center on Global Climate Change, 2006, pp1-24.
www.pewclimate.org

- The IPCC reports
- International meetings: Rio de Janeiro and Kyoto
- Ratification and Implementation of Kyoto treaty
- U.S. efforts: McCain-Lieberman
- Efforts by States, Cities, and Corporations

Required reading:

Climate Stewardship Act of 2003. S.139

CRS Report to Congress: Climate Change: Senate proposals to reduce greenhouse gas emissions. And Global climate change: The Kyoto protocol

Session 10 – April 3 WTC Dust Policy Directives Guest Lecturer: Joan Reibman MD, Director of Bellevue WTC Dust Environmental Health Center

Events of 9/11 followed by local, state, federal responses to WTC Dust cloud; Clinical studies followed by epidemiological studies of FDNY workers and health effects. Epidemiological studies of residents. Development of regional clinics to study First Responders and Clean-up workers. Development of WTC Environmental Health Center at Bellevue.

Reading: Weiden MD, Banauch G, Kelly, KJ, and Prezant DJ. Chapter 28 in Rom WN. Ed. Environmental and Occupational Medicine 4th Ed, Philadelphia, PA, 2007.

Session 11 – April 10 Land Use: Wilderness Challenges and Northern Forest-NY

Guest Lecturer: Kim Elliman, Director of Open Space Institute, New York, NY

- Challenges for the U.S. Forest Service and Bureau of Land Management.
- Wilderness proposals before the U.S. Congress
- Wilderness management issues re: off-road vehicles, closing backroads, and logging.

Required Reading:

Scott D, The Enduring Wilderness, Golden, CO.: Fulcrum Publishing, 2004. Chapter 5. Expanding the scope of wilderness preservation. Chapter 6. Wilderness yet to save. Chapter 7. Wilderness politics.

Optional reading:

Session 12 –April 17 Ozone Hole and Chlorofluorocarbons

- Atmospheric chemistry and consumption of ozone in the stratosphere in extreme cold.
- Montreal Protocol
- Outcome of this regulation and prospects for complete response.
- Interactions.

Required reading:

Molina MJ and Molina LT. Chlorofluorocarbons and Destruction of the Ozone Layer. Chapter 106 in Rom WN, Ed., Environmental and Occupational Medicine, 4th Ed., Philadelphia, PA., 2007.

Session 13 – April 24 Land Use: The Wilderness Act and NEPA

- The Wilderness Act of 1964.
- Protection of wilderness lands in the U.S. and Alaska and Antiquities Act.
- NEPA and the Environmental Impact Statement.
- Endangered Species Act.

Required reading:

Miller JG and Rom WN. Environmental Law and the Science of Ecology. Chapter 107 in Rom WN, Ed., Environmental and Occupational Medicine, 4th Ed., Philadelphia, PA., 2007.

Session 14 –May 1 Land use: Arctic National Wildlife Refuge-The Cause Celebre’

- History of ANWR and its ecology
- Proposals for oil development
- History of proposals to protect vs. develop this wilderness resource

Required reading:

Waterman, Jonathan. Where Mountains are Nameless: Passion and Politics in the Arctic National Wildlife Refuge. New York: W.W. Norton & Company, 2005.

REQUIRED PAPERS

5% of your grade is based on class participation.

Personal Resume (Pass/Fail) – Provide a very brief resume/vita/something that describes who you are, employment experience, outdoor experiences, and career goals.

Due Date: Session 2

Paper 1– (25% of final grade) – 6-8 pages – You are a newly hired policy staff person for the newly-elected Governor of New York and are assigned to write a vision statement for his air pollution program. Research a topical air pollution problem for New York and decide on a strategy to address this problem.

Due Date: Session 5

Paper 2--(20%) of final grade) – 6-8 pages- You are having lunch with a New York power broker and you want to impress him/her about your new-found expertise in environmental policy. They ask you ‘what about this Global Warming?’ Do you believe it? What will be the solution? Make a compelling argument for an intelligent lay person in order to convince him/her about your point of view!

Due Date: Session 8

Paper 3 (25% of final grade)- 8 pages- Please review a problem in environmental policy that you will address. This could be the neurodevelopment literature review related to mercury exposure from coal-fired power plants, creating a wilderness bill for an unroaded area of a national forest, a wild river, developing a program to outfit an entire NYC apartment building in energy-efficient light bulbs, researching an air toxic, describing an alternative water supply for a city of 10M near the equator that receives its potable water from a rapidly disappearing glacier, creating an Environmental Impact Statement for a wind farm in New York Harbor, etc.

Due Date: Session 11

Paper 4 (25% of final grade) 8 pages. Please review a policy recommendation to solve the Global Warming/Climate Change Crisis.

Due Date: Session 14