

The Earth Institute Center for Environmental Sustainability

Executive Education Program

Fall Semester 2018 Course Descriptions

MODULE 1

September to October

Environmental Economics

Instructor: Urvashi Kaul

Fulfills requirement: Fundamental (F)

Day: Tuesday

Dates: Sept. 4, 11, 18, 25, Oct. 2 (Module 1, 5 sessions)

Time: 6:10 – 8:10 PM

Course number: ENVB 0353 N

Course Description

This course provides an introduction to environmental economics through a discussion of the basic principles of microeconomics as they apply to environmental issues and analysis of case studies that illustrate how economics can guide conservation practice and policy. Class discussions also includes a review of solutions to market failures, such as taxes and subsidies, fees and quotas, and tradable emissions permits (e.g., carbon markets).

About the Instructor

Urvashi Kaul is the Education Manager for RFK Compass. She works with the investment community to encourage the use of sustainability as an integral part of their strategies. Prior to joining RFK Compass in 2012, Ms. Kaul was an Assistant Director for Economic Research and Analysis at the New York City Economic Development Corporation, where she evaluated economic and fiscal impacts of development projects and events, and analyzed policies and proposals related to New York City's economic development. She served as the standing advisor for the New York City Labor Market Information Service at the Center for Urban Research, City University of New York. Before that, she was an Economist for Fiscal and Budget Studies at the Office of the New York City Comptroller. Ms. Kaul is an Adjunct Assistant Professor of International and Public Affairs at Columbia University, where she teaches graduate level courses in Economics and Finance. She serves as the chair of the board of directors of Adhikaar, a New York based not-for-profit organization promoting social justice and human rights. She also serves as a member, board of directors of Asia Initiatives. A native of Kashmir, India, her education includes a MPA from Columbia University with a concentration in international finance and economic development, a master's degree from the Delhi School of Economics at

the University of Delhi, and an undergraduate degree from Miranda House College at the University of Delhi.

The World on Your Plate: Food, Equity, and Sustainability[^]

Instructor: Mia MacDonald

[^]Sustainable Food Systems Track course

Fulfills requirement: Food Systems (FS) **OR** Environmental Policy, Management, and Finance (EPMF)

Day: Wednesday

Dates: Sept. 5, 12, 19, 26, Oct. 3 (Module 1, 5 sessions)

Time: 6:10 – 8:10 PM

Course number: ENVB 0408 N

Course Description

This course will provide an overview of the multiple and varied intersections among environmental, social, and ethical factors involved in global food production and consumption. The broad challenge and opportunity of sustainability requires such a multifaceted approach, which deviates significantly from many current, unsustainable models that focus on single factors like yield. A focus of the course will be animal agriculture. The course is about public policy—its development as well as implementation. It will, however, also explore the roles of public understanding and collective and individual action in changing practices.

About the Instructor

Mia MacDonald is the Executive Director and founder of Brighter Green, a public policy action tank based in New York that works at the intersection of issues related to the environment, animals, and global development. She conceives and manages Brighter Green’s research and program implementation, including in the area of food policy and equity. She is a public policy analyst and writer who has during her career worked as a non-profit program manager and consultant to a range of international non-governmental organizations—including the Ford Foundation, the World Wildlife Fund, the Green Belt Movement, the Sierra Club, and several United Nations agencies, among others. She has published many articles in popular and environmental media, authored a number of policy papers and reports, and contributed to four books, including Nobel Peace Laureate Wangari Maathai’s best-selling autobiography, *Unbowed*. She has taught in the human rights program at Columbia University’s School of International and Public Affairs and the environmental studies department at New York University. She is a member of the board of directors of the Green Belt Movement International – North America, the Culture & Animals Foundation, and the Africa Network for Animal Welfare. She received a master’s degree in public policy from the Kennedy School of Government at Harvard University, a BA with honors from Columbia University, and also studied English literature and language at Oxford University.

New course!

Hurricanes, Nor'easters, and Sea Level Rise: Implications for Coastal Systems*

Instructor: Dr. James Cervino

Fulfills requirement: Case Study (CS)

Day: Thursday and a Saturday field session

Dates: Sept. 6, 13, 20, 27 (Module 1, 4 sessions on Columbia Morningside Campus)

Time: 6:10 – 8:10 PM

Field session date: Saturday, September 22 from 4:00 PM – 6:00 PM

Field session location: The Oyster Reef and Wetlands Restoration Project in Queens**

Course number: TBD

**** Students are responsible for transportation to the field site**

Course Description

Under a warmer global climate, glacier and continental ice sheet melt contribute to sea level rise (SLR) through the input of increased volumes of freshwater to the ocean, while heat absorption by the ocean contributes to SLR via the process of thermal expansion. Recent reports indicate that SLR and changes in ocean currents are creating atmospheric and oceanic instability, both of which are expected to contribute to intensified natural disasters (e.g., extreme storms) in the next 50 years along coastal zones, including New York City. Given the high population densities in certain coastal zones and the unique ecosystems found along other coasts (e.g., mangroves and coral reefs), such disasters may have devastating effects on both human and natural coastal systems. In this course, students will learn and apply basic concepts in oceanography and atmospheric science to understand relationships between SLR, climate change, ocean and atmospheric circulation, and near-shore coastal processes. The course will draw on New York City as a case study to explore current and future impacts of SLR and extreme events.

About the Instructor

Dr. James Cervino holds a bachelor's degree from New York University that focused on earth science and physical anthropology, a master's degree from Boston University in marine biology, and a PhD in marine science from University of South Carolina. His research interests involve the investigation of global warming-induced climate change and chemical pollution and its links to disease, compromised immunity, and cancer in marine habitats globally. His current research interests are to understand how chemicals move through food chains and the biological and ecological effects of chemical pollution, thermal stress, and disease on tropical marine life and wetlands, specifically marine plants and Cnidarians globally. He recently started an environmental consulting firm in New York City and is a visiting scientist at the Woods Hole Oceanographic Institution.

MODULE 2

October to November

New course!

Nutrition Through the Life Cycle: More Than Just a Matter of Food[^]

Instructor: Dr. Melanie Uhde

[^]Sustainable Food Systems Track course

Fulfills requirement: Nutrition and Health/Hunger (NHH) **OR** Tools (T)

Day: Tuesday

Dates: Oct. 9, 16, 23, 30, Nov. 6 (Module 2, 5 sessions)

Time: 6:10 – 8:10 PM

Course number: TBD

Course Description

The Sustainable Development Goals, adopted by 193 countries in 2015, set 169 targets to achieve sustainable development by 2030 through integrative action. Malnutrition has been recognized as a critical goal of attaining global sustainable development. The recent “Global Nutrition Report” of 2017 summarized the scale of the *Triple Burden*:

- 200 million children are undernourished regarding calorie deficiency
- 4.4 billion people including children are overweight or obese
- 2 billion people are deficient for essential micronutrients such as vitamin A

Malnutrition affects the sustainable development of nations in different ways and has high economic costs in both the short and the long run. It is estimated that malnutrition costs up to US \$3.5 trillion per year to the global economy, prompting the design of national and international strategies to address this problem. And yet, implementation of such strategies remains a challenge due to a lack of evidence on how well these policy and program interventions contribute to sustainability.

This course will examine the global nutrition challenges through the lens of a conceptual framework that views malnutrition as a multidisciplinary and complex problem. We will analyze the interconnectiveness between nutritional requirements throughout the life cycle and socioeconomic factors such as education, gender bias, and disease burden to evaluate nutrition interventions in regard to their effectiveness in tackling malnutrition. Examples of social safety programs and school feeding programs in the United States, Brazil, India, and Ethiopia will help students understand the content and methods necessary to design evidence-based and integrative nutrition interventions that can contribute to the achievement of global sustainability.

About the Instructor

Dr. Melanie Uhde is an Associate Research Scientist at the Columbia University Medical Center where she leads research projects on the link between nutrition and immune responses in autoimmune and infectious diseases. Her primary interests are nutrition programs, socioeconomic factors such as gender and education that intersect with nutritional interventions, and evaluation methods to implement effective policies. She has worked with non-profit organizations in Jamaica and Thailand and published policy memos on the effectiveness and economics of nutrition programs with the *Sustainable Development Solutions Network*. In 2017, she founded the *Urban17 Initiative* that aims to identify and communicate innovative solutions to urban challenges in the era of the *Sustainable Development Goals* (SDGs) through a multidisciplinary systems approach. Dr. Uhde is a member of the SDG Initiative at the New York Academy of Sciences and serves as a consultant to identify research gaps in nutrition science to achieve the SDGs and define strategic directions to fill these gaps. She earned a master's degree in biology and completed her PhD in immunology at the Institute for Tropical Medicine in Hamburg, Germany.

New course!

Water Resources Management

Instructor: Dr. Indrani Pal

Fulfills requirement: Environmental Policy, Management, or Finance (EPMF) **OR** Case Study (CS)

Day: Wednesday

Dates: Oct. 10, 17, 24, 31, Nov. 7 (Module 2, 5 sessions)

Time: 6:10 – 8:10 PM

Course number: TBD

Course Description

The fragility of water resources under a changing climate and human impacts has received growing attention among policy makers, planning and environmental agencies, stakeholders, and beyond. Water is our new oil and it is not an infinite resource. This course provides an introduction to the science needed to understand water resources management. A range of crucial topics will be covered, including the global water cycle, the linkage between water and climate, and how water is managed and can be managed more sustainably. Using this knowledge, students will conduct case studies to understand and receive hands-on training that can be used to guide water management decisions.

About the Instructor

Dr. Indrani Pal is a Research Assistant Professor and scientist at National Oceanic and Atmospheric Organization (NOAA) Center for Earth System Sciences and Remote Sensing Technologies at City University of New York. She holds an Adjunct Scientist position at Columbia Water Center, and a Lecturer position at the School of Professional Studies (SPS) at Columbia University where she teaches a number of graduate and undergraduate level courses such as

Water Resources and Climate, Introduction to Statistics for Ecology, and Evolutionary Biology. Previously, Dr. Pal held an Assistant Professor position at University of Colorado, Denver. Her research focuses on investigating water resources risk, climate variability, and food system instability.

Dr. Pal comes from India with a background in Civil Engineering (India), M. Tech degree in Water Resources Engineering (Indian Institute of Technology Delhi and University of Stuttgart, Germany), an M. Phil in Environmental Engineering Sciences and Sustainability (University of Cambridge, UK) and a PhD in Environmental Engineering Sciences and Sustainability (University of Cambridge, UK). She has received a number of prestigious national and international scholarships throughout in her career from sources such as the Indian Ministry of Human Resources, DAAD from Germany, UK Cambridge Commonwealth Trust, and an Overseas Research Scholarship from the UK. Dr. Pal received her postdoctoral training from the International Research Institute for Climate and Society at The Earth Institute, Columbia University.

Environmental Markets: The Nexus of Business, Regulation, and Sustainability

Instructor: Richard Weihe

Fulfills requirement: Environmental Policy, Management, and Finance (EPMF) **OR** Tools (T)

Day: Thursday

Dates: Oct. 11, 18, 25, Nov. 1, 8 (Module 2, 5 sessions)

Time: 6:30 – 8:30 PM

Course number: ENVB 0373 N

Course Description

Environmental markets, such as cap and trade applications, have been used to efficiently address pollution since the Clean Air Act amendments in 1990. Since the advent of the cap and trade Acid Rain Program (ARP), a wide variety of environmental markets have resulted in order to address air quality, climate change, water pollution, endangered species, and renewable power and fuels mandates. This course reviews the regulatory, political, and business contexts of today's environmental markets, using real world examples and actual case studies. While the course will review historic and current CO₂-related markets addressing climate change, it will also survey a variety of other markets, both in the United States and internationally.

The course covers the potential benefits and limitations in addressing environmental problems and corporate sustainability objectives through such market mechanisms. Learn the history of the development of environmental markets and how they are used to solve environmental problems. Topics include CO₂ cap and trade, renewable portfolio standard (RPS) markets used to spur wind and solar development, air pollution reduction schemes, wetlands and conservation banking, and water pollution programs.

About the Instructor

Rich Weihe has over twenty years of experience in the energy and environmental sectors in roles of investment management and advisory services, energy and environmental commodity trading, and environmental management consulting. At [Karbone](#), he oversees the firm's practices in capital advisory services and spearheads new business segment initiatives. Prior to Karbone, Rich was a senior investment analyst with RNK Capital where he originated and directed investment analysis on private equity and project-related energy and environmental credit transactions associated with solar, wind, geothermal, biogas, and biofuels-related technologies. Prior to RNK Capital, Rich held a variety of commercial and management positions in the energy and environmental risk management sectors. Rich began his career at AECOM, where he managed water resource and environmental projects in the energy and waste management sectors. He holds an MBA from Northwestern University, an MS in geosciences from Ohio State University, and a BA in geosciences from Denison University.

MODULE 3

November to December

Ecology of Emerging Diseases

Instructor: Dr. Peter Daszak

Fulfills requirement: Case Study (CS)

Day: Monday

Dates: Nov. 12, Dec. 3, 10, 17* (Module 3, 4 sessions)

Time: 6:10 – 8:40 PM*

Course number: ENVB 0306 N

***Class meets four times with longer sessions**

Course Description

Why do pandemic diseases like AIDS, Ebola, influenza and SARS emerge? What causes them to 'spillover' from wildlife to people and spread so rapidly around the world? More than 60% of emerging infectious diseases that affect humans originate in animals and more than two-thirds of those originate in wildlife. Human processes that infringe upon previously uninhabited areas have the potential to profoundly affect our exposure to diseases around the world, causing millions of people to become infected, and costing billions of dollars each year. Yet health assessments rarely take into account the principles of disease ecology, the interaction of the behavior and ecology of hosts with the biology of pathogens. In this course you will gain an overview of the principles of disease ecology with an emphasis on the effect of disease on human, wildlife, domestic animals, and ecosystem health. We will explore the environmental and socioeconomic drivers behind the rise of Ebola, SARS, HIV and other devastating pandemics, and examine the impact of disease on biodiversity and rates of extinction.

About the Instructor

Dr. Peter Daszak is President of EcoHealth Alliance (EHA), a US-based organization which conducts research and outreach programs on global health, conservation and international development. Dr. Daszak's research has been instrumental in identifying and predicting the impact of emerging diseases across the globe. His achievements include identifying the bat origin of severe acute respiratory syndrome (SARS), identifying the underlying drivers of Nipah and Hendra virus emergence, producing the first ever global emerging disease hotspots map, identifying the first case of a species extinction due to disease, coining the term "pathogen pollution," and discovering the disease chytridiomycosis as the cause global amphibian declines. Dr. Daszak is a member of the Institute of Medicine's (IOM) Forum on Microbial Threats, the One Health Commission Council of Advisors, the Center of Excellence for Emerging and Zoonotic Animal Diseases (CEEZAD) External Advisory Board, and served on the IOM Committee on global surveillance for emerging zoonoses, the National Research Council (NRC) committee on the future of veterinary research, the International Standing Advisory Board of the Australian Biosecurity Cooperative Research Centre (CRC), and he has advised the Director for Medical Preparedness Policy of the White House National Security Staff on global health issues. Dr. Daszak won the 2000 Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO) medal for collaborative research on the discovery of amphibian chytridiomycosis, is the EHA institutional lead for the US International Development Agency Emerging Pandemic Threats (USAID-EPT) PREDICT project, and is Editor-in-Chief of the journal EcoHealth. He has authored over 200 scientific papers, and his work has been the focus of extensive media coverage, ranging from popular press articles to television appearances.

Agricultural Economics^

Instructor: Bipasha Chatterjee

^Sustainable Food Systems Track course

Fulfills requirement: Food Economics and Sustainability (FES) **OR** Case Study (CS)

Day: Tuesday

Dates: Nov. 13, 27, Dec. 4, 11, 18 (Module 3, 5 sessions)

Time: 6:10 – 8:10 PM

Course number: ENVB 0520 N

Course Description

This course takes an in-depth look at the causes of hunger and malnutrition, the economics of agricultural development and world food systems, the measures for achieving food security for all, and the future of agriculture and food systems under climate change. The course will rely on recent case studies to illustrate and analyze the underlying political and economic structures influencing these issues.

About the Instructor

Bipasha Chatterjee is an environmental economist and a policy consultant with post-graduate degrees from the University of Cambridge, UK and from the London School of Economics, UK. She started her career with the Food and Agriculture Organization of the United Nations in Rome, Italy and went on to work as a governance reform consultant (KPMG and AEA GROUP) in the UK. She has extensive experience in working on environmental and climate change policy issues. She has led projects in the areas of climate change mitigation action, Kyoto Protocol and clean development mechanism (CDM), renewable energy-related research, and advisory work. She is currently an Executive Education Instructor for the Earth Institute Center for Environmental Sustainability teaching courses on Environmental Policy and Agricultural Economics. She also teaches BA and MA Environmental Economic courses at Hunter College, City University of New York & Roosevelt House Public Policy Institute.

Diversity and Conservation

Instructor: Dr. Matt Palmer

Fulfills requirement: Fundamental (F)

Day: Thursday

Dates: Nov. 15, 29, Dec. 6, 31, 20 (Module 3, 5 sessions)

Time: 6:10 – 8:10 PM

Course number: ENVB 0300 N

Course Description

Human life and well-being are dependent on goods and services provided by nature. However, this natural capital is chronically undervalued and often poorly understood. Biodiversity – the variety of life on earth – supports many ecosystem functions and the loss of diversity can have both obvious and subtle consequences. This course explores the scientific issues related to the origin, distribution, and functions of biodiversity and the consequences of biodiversity loss. We discuss a range of tools for conserving biodiversity – including species recovery plans, protected area management, and ecosystem-based management.

About the Instructor

Dr. Matt Palmer is a faculty member in the department of Ecology, Evolution and Environmental Biology (E3B) at Columbia University. His research interests are based in plant community ecology, with emphases on conservation, restoration and ecosystem function. Dr. Palmer has done research on the effects of microtopography and plant interactions on centimeter-scale diversity patterns in fens of the New Jersey Pinelands. He is currently conducting research on the community dynamics and ecosystem functions of urban forests and green roofs, the population biology of rare plants, and the effects of forest canopy disturbance on understory structure and function.