



Online Master of Natural Resources Program

NON-THESIS DEGREE CONSISTING OF 10 CLASSES (30 HRS)

- 5 required core classes
- 5 elective classes (chosen with guidance from Graduate Advisor)



Required Core Classes

CONSTRUCTING SUSTAINABILITY (3)

INSTRUCTOR: Ms. Elizabeth Hurley (eliza17@vt.edu)

This course examines the science, policy, and practice of sustainability and sustainable development in a global context. We will examine the history, current status, and future prospects of sustainability and sustainable development from economic, social, and ecological perspectives. In the past several decades, sustainability and sustainable development have gained status in political, scientific, business, religious, and cultural institutions and are now guiding principles that frame and shape public policy and private practice at multiple scales. While these concepts are well-established in many communities and cultures worldwide, they have only recently emerged as prominent features in the mainstream of contemporary popular culture throughout global society. This interdisciplinary course encourages students to consider how they can engage science, policy, professional, and civic institutions in constructing sustainability.

OFFERED: Fall, Spring, Summer

GLOBAL ISSUES IN ENVIRONMENTAL SUSTAINABILITY (3)

INSTRUCTOR: Dr. Omchand Mahdu (omchand4@vt.edu)

+ Global Study Faculty

The purpose of this course is to build competencies in sustainability professionals to think globally about sustainability challenges and their career, to situate their own professional work in a global context, to better understand sustainability situations and tools for examining them, and to practice team/collaborative project management and problem-solving skills. The course is organized into four broad areas of focus: the global Anthropocene, sustainability case analysis, leadership, and culture competencies. This course is designed to support a Global Study scheduled for the same semester.

OFFERED: Fall, Spring, and Summer



LEADERSHIP COMMUNICATION FOR SUSTAINABILITY PROFESSIONALS (3)

INSTRUCTOR: Ms. Mary Berry (maryb19@vt.edu)

Communication is a discipline that's important for every field and function, but it's particularly critical for sustainability professionals, who work with countless stakeholders across a variety of sectors. This course introduces the field of environmental communication, including historical contexts, public participation, media, risk communication, and conflict management. Students will explore their own communication strengths and opportunities through the lenses of personal awareness, interpersonal connection, building trust, influence and persuasion, framing a message, and creating a shared context and vision.

OFFERED: Fall, Spring, and Summer

STRATEGIES FOR SUSTAINABILITY (3)

INSTRUCTORS: Dr. Marc Stern (mjstern@vt.edu)
Dr. David Robertson (davidrobertson@vt.edu)
Dr. Marcy Schnitzer (mhs@vt.edu)

Strategies for practicing sustainability professionals to influence sustainability outcomes; focus on social science approaches to influencing and explaining human behavior; review of key theories; applied projects focused on interventions to address sustainability challenges.

OFFERED: Fall, Spring, and Summer

SUSTAINABILITY SYSTEMS (3)

INSTRUCTOR: Dr. Daniel Marcucci (marcucci@vt.edu)

Systems thinking needed by sustainability professionals. Basic competencies, language, and confidence needed to engage with other experts in collaborative problem-solving processes for pressing global sustainability challenges. Focus on sustainability systems represented in the United Nations Sustainable Development Goals: water, climate, agriculture, energy, poverty, urbanization, global material flows, and biodiversity. System properties and other leverage points for influencing change. Collaborative problem-solving skills needed to work on multidisciplinary teams. Double loop learning, and reframing problems and questions.

OFFERED: Fall, Spring, and Summer

Elective Classes

General Sustainability

ENVIRONMENTAL ETHICS (3)

INSTRUCTOR: Dr. Marcy Schnitzer (mhs@vt.edu)

Environmental problems are incredibly complex, in moral as well as in economic, political, and biological terms; however, there is often a desire to oversimplify both the roots of current environmental crises as well as the possible responses. Emphasis on responsibility and accountability as a framework for analysis.

OFFERED: Spring

FOOD POLICY & SUSTAINABILITY (3)

INSTRUCTOR: Dr. Jennifer Jones (jenjones@vt.edu)

This course builds on the principles of biodiversity science across the many components of stewardship. Participants each identify a study that provides the context for investigating, documenting, analyzing, and promoting biodiversity. Skills developed in this course can be immediately applied to real-world needs, and some participants may design their projects and products to address an existing need.

OFFERED: Fall

SUSTAINABILITY CASE STUDIES (3)

INSTRUCTOR: Dr. Jennifer Lawrence (jennlaw@vt.edu)

Those of us who are passionate about the environment and sustainability issues often think first about solving problems in far corners of the globe. Examining our own neighborhoods, cities, and regions can provide insights into the challenges of sustainability on a global scale. Students investigate the places where they live and use the information gathered to develop case studies illustrating important aspects of sustainability.

OFFERED: Summer (even#)



HUMAN-WILDLIFE CONFLICTS (3)

INSTRUCTOR: Dr. Megan Draheim (mdraheim@vt.edu)

Human-wildlife conflict resolution is a rapidly growing area within the wildlife sciences that draws upon the need for multi-disciplinary approaches to resolve complex issues associated with human domination of ecosystems. The problems people have with wild animals, and the problems wild animals have with people, require the use of cooperative, collaborative, and innovative approaches if they are to be resolved in ways that maximize both social and ecological benefits. This course draws upon some of the emerging issues associated with human-wildlife conflicts, and through the use of case histories and examples explores the theory and practice of conflict resolution, as well as the practical ethics needed to navigate contemporary wildlife management.

OFFERED: Spring

INDEPENDENT STUDY (1-6)

INSTRUCTOR: Varies

Independent Study is designed for students who would like to work an individual project one-on-one with an assigned instructor or advisor. The course may be taken in the Fall, Spring, or Summer terms, depending on instructor availability, for 1-6 credits (3 is most common). Interested students need to schedule an advising appointment with Dr. Kieran Lindsey (klindsey@vt.edu) to discuss the proposed project and potential instructors.

OFFERED: Fall, Spring, Summer

INTERNATIONAL ENVIRONMENTAL LAW & POLICY (3)

INSTRUCTOR: Ms. Jennifer Wills (jenwills@vt.edu)

International environmental law has grown over the past 30 years, from a handful of agreements focused primarily on pollution of the marine environment and the conservation of migratory birds and marine mammals, to over 700 agreements today that address a multitude of serious environmental issues. This course provides an overview of current international environmental law and assessment and enhancement of effectiveness.

OFFERED: Spring

STUDY ABROAD (3)

INSTRUCTOR: Varies

For students who want additional study abroad experiences (beyond the required NR-5114 Global Issues course). For more information, contact Dr. Kieran Lindsey (klindsey@vt.edu).

OFFERED: Fall, Spring, and Summer

COVID-19 UPDATE:

To keep our students and faculty safe and to help slow down the spread of the novel coronavirus, we are postponing all Global Study trips in accordance with [Virginia Tech's travel and study abroad policies](#).

TRANSBOUNDARY RESOURCE MANAGEMENT (3)

INSTRUCTOR: Dr. Courtney Kimmel (cekimmel@vt.edu)

Boundaries are created by humans to define ownership, sovereignty, and jurisdiction, as well as to confer rights, responsibilities, and accountability at all levels—individual, local, regional, national, and international. However, natural resources systems do not conform to and are not contained by political, cultural, and economic boundaries. This course views transboundary resources through diverse lenses, including global markets; transnational communication and transportation systems; logistics and supply systems; and increasingly sophisticated and complicated international and transnational legal structures.

OFFERED: Spring



Elective Classes

Biodiversity and Ecosystems

ADAPTIVE MANAGEMENT (3)

INSTRUCTOR: Dr. Heather Eves (heves@vt.edu)

Faced with limited resources to confront growing challenges, conservation organizations must show that their efforts are strategic, systematic, and results-oriented. This course provides students with the skills and knowledge to design and implement effective conservation projects and to generate clear evidence of their progress toward achieving conservation results. The course provides training in adaptive management (AM), including: planning, monitoring, implementing, analyzing, learning from, and adapting conservation projects—essential knowledge and skills for current and emerging conservation practitioners.

OFFERED: Spring

BIODIVERSITY POLICY (3)

INSTRUCTOR: Dr. Desiree Di Mauro (ddimauro@vt.edu)

Conservation biologists warn that we are in the midst of a great “extinction crisis,” with millions of species threatened due to habitat destruction, climate change, and other anthropogenic factors. This course focuses on examining how we are (and should be) constructing legal regimes and effective political institutions to conserve Earth’s endangered forms of life across multiple levels (ecosystem, landscape, species, population, and genetic diversity). We will examine U.S. legal and political responses to biodiversity loss, with a focus on the Endangered Species Act, as well as the role of international law, especially treaty regimes. We will look at how law is(n’t) succeeding in preserving life on Earth, and pay particular attention to the most effective legal practices to conserve biodiversity.

OFFERED: Summer (odd#)

BIODIVERSITY STEWARDSHIP (3)

INSTRUCTOR: Dr. James Egenrieder (jime@vt.edu)

This course builds on the principles of biodiversity science across the many components of stewardship. Participants will each identify a study area (local site or area, a county, or larger region) that provides the context for investigating, documenting, analyzing, and promoting biodiversity. Accordingly, students’ projects and course products are highly variable and reflect a wide variety of professional, academic, and personal interests. Skills developed in this course can be immediately applied to real-world needs, and some participants may design their projects and products to address an existing need.

OFFERED: Summer

CONSERVATION ECOLOGY (3)

INSTRUCTOR: Dr. Desiree Di Mauro (ddimauro@vt.edu)

Dr. Megan Draheim (mdraheim@vt.edu)

Human activities are having a cumulative effect on the natural systems upon which life depends. Future land management impacts will likely entail unprecedented change in environmental conditions. Conservation ecology provides insights into the many benefits and services that nature offers, and explores strategies to sustain ecological integrity and plan landscapes for human use. It is an emerging interdisciplinary approach to harmonizing the interactions between people and nature at ecosystem scales.

OFFERED: Spring, Summer



Elective Classes

Cities and Urban Systems

INFRASTRUCTURE FOR RESILIENCE (3)

INSTRUCTOR: Dr. Courtney Kimmel (cekimmel@vt.edu)

Ranging from site-scale strategies, such as green roofs for managing stormwater, to regional networks of riparian corridors, infrastructure planning and design offers opportunities and challenges for planners, policy and decision makers, scientists and researchers, landowners, and taxpayers across the urban–rural gradient. This course explores the broader contexts which have given rise to green infrastructure planning and design, both in the U.S. and internationally; identifies and examines different critical scales for conceptualizing green infrastructure and practical strategies being employed at each scale; and compares policy goals and programs supporting green infrastructure in the U.S.

OFFERED: Fall

URBAN ECOLOGY (3)

INSTRUCTOR: Mr. Conaway Haskins (chaskins@vt.edu)

Approximately 50% of the world's people are now classified as urban, and they are motivated by a desire to create healthy human ecosystems and sustainability communities in which to live, work, and play. Are cities sustainable environments? What are civic stakeholders, local communities, and global society doing to ensure that urban and urbanizing landscapes are healthy and desirable places to live?

OFFERED: Summer

URBAN WATER SYSTEMS (3)

INSTRUCTOR: Dr. Daniel Marcucci (marcucci@vt.edu)

Water is the lifeblood of cities. Freshwater, wastewater, and environmental water systems each provide vital services, and each can cause profound problems. Citizens and industry require freshwater to live and function. Without adequate wastewater management cities quickly become unhealthy, fetid places. Imbalances in environmental water can cause degradation, drought, and fire or, conversely, catastrophic flooding. This course examines urban water systems as an integrated management challenge. Case studies drawn from cities in North American and global regions experiencing rapid urbanization are used to identify emerging problems and prescribe best practices.

OFFERED: Summer

URBAN WILDLIFE (3)

INSTRUCTOR: Dr. John Hadidian (jhadidi@vt.edu)

Eight out of ten Americans now live in cities or towns of 50,000 people or more, and 50% of the world's human population now lives in urban areas. While it's a common assumption that cities are inhospitable to non-human animal life, we have ample evidence to indicate that not only do some wildlife species survive in urban areas—they can thrive. One positive outcome is that people can directly enjoy and appreciate wildlife close to home, adding to their quality of life and connection to the natural world. A negative consequence is that conflicts between people and wildlife are on the rise. Urbanization has created new challenges for a variety of natural resource professionals, and most have little or no special training in this area. This course is organized into five learning units: urban landscapes, urban ecosystems, urban habitats and hazards, sociopolitical issues, and special management considerations.

OFFERED: Fall



Elective Classes

Climate Change

CLIMATE ADAPTATION (3)

INSTRUCTOR: Dr. Paul Wagner (pwagner@vt.edu)

This course enables students to develop adaptation plans at varying geographic and temporal scales built around an understanding of the key components of vulnerability: the sensitivity, exposure, and adaptive capacity of natural and human systems. These key drivers of climate vulnerability will be used, along with socio-political and policy analysis, to develop adaptation plans that are informed by science, policy, and societal considerations. Throughout the course, we will tackle the importance of characterizing and incorporating uncertainty (epistemic, stochastic, and response uncertainty). We will also examine our understanding of the limits of adaptation and how adaptation opportunities will be constrained under various climate change scenarios.

OFFERED: **Fall**

CLIMATE CHANGE POLICY (3)

INSTRUCTOR: Dr. Adam Kalkstein (climate@vt.edu)

This course focuses on institutional responses to climate change at the international, national, and sub-national levels, including the United Nations Framework Convention on Climate Change, the Kyoto Protocol, and U.S. climate policymaking under the Clean Air Act and state and regional initiatives. Both mitigation and adaptation approaches will be addressed, as well as climate geoengineering.

OFFERED: **Summer**

CLIMATE CHANGE SCIENCE (3)

INSTRUCTOR: Dr. Adam Kalkstein (climate@vt.edu)

As average global temperatures continue to rise, it is imperative to not only understand the science behind climate change, but also its potential ramifications and impacts. This course explores the why, how, and when behind climate change. Contemporary readings are used to spark discussion and debate surrounding the potential implications of climate change. The course culminates in a “Congressional Briefing” for which students synthesize their knowledge and propose a political solution.

OFFERED: **Spring**

INFRASTRUCTURE FOR RESILIENCE (3)

INSTRUCTOR: Dr. Courtney Kimmel (cekimmel@vt.edu)

Ranging from site-scale strategies, such as green roofs for managing stormwater, to regional networks of riparian corridors, infrastructure planning and design offers opportunities and challenges for planners, policy and decision makers, scientists and researchers, landowners, and taxpayers across the urban–rural gradient. This course explores the broader contexts which have given rise to green infrastructure planning and design, both in the U.S. and internationally; identifies and examines different critical scales for conceptualizing green infrastructure and practical strategies being employed at each scale; and compares policy goals and programs supporting green infrastructure in the U.S.

OFFERED: **Fall**



Elective Classes

Society & Sustainability

ADAPTIVE MANAGEMENT (3)

INSTRUCTOR: Dr. Heather Eves (heves@vt.edu)

Faced with limited resources to confront growing challenges, conservation organizations must show that their efforts are strategic, systematic, and results-oriented. This course provides students with the skills and knowledge to design and implement effective conservation projects and to generate clear evidence of their progress toward achieving conservation results. The course provides training in adaptive management (AM), including: planning, monitoring, implementing, analyzing, learning from, and adapting conservation projects—essential knowledge and skills for current and emerging conservation practitioners.

OFFERED: Spring

ENVIRONMENTAL DECISION-MAKING FOR THE ANTHROPOCENE (3)

INSTRUCTOR: Dr. Michelle Hilleary

This course will explore choices at the individual, group, and societal levels, including their impact on the environment. The objective is to produce better decision-makers and decision-influencers, equipped with insights into new ways of thinking about choices and rooted in decision analysis. Through practical activities, it highlights techniques to avoid pitfalls and enhance transparency on what is desired and how to best achieve it.

OFFERED: Fall

ENVIRONMENTAL FORENSICS (3)

INSTRUCTOR: Dr. Jennifer Lawrence (jennlaw@vt.edu)

Students in this skills-based course will collect, examine, and analyze information about current environmental challenges to develop skills applicable to a variety of resource-related professions, including research, critical thinking, and communications. Students gain a nuanced and holistic competence in handling sustainability topic components, such as: stakeholder goals, expectations, and behaviors; identification of cross-sectors and confounding factors; and evaluating the effectiveness of existing response efforts.

OFFERED: Summer (odd#)



Elective Classes

Sustainable Business

BUSINESS SUSTAINABILITY APPLICATIONS (3)

INSTRUCTOR: Mr. Kevin Rabinovitch

Business and corporate sustainability theory and best practices for environmental sustainability professionals. Business motivations for sustainability. Corporate social responsibility and sustainability programs and practices. Markets and demand for green goods and sustainable brands. Global trends in markets and demographics. Supply chain management for climate and other sustainability challenges. Sustainable dimensions of investing, reporting, employee recruitment and retention, insurance, and risk management. Circular economy policy and theory.

OFFERED: Spring

CIRCULAR ECONOMY (3)—COMING SOON

INSTRUCTOR: TBA

What is a circular economy? It is a vision of an economic system that looks beyond the conventional linear model of take–make–waste to a future that is restorative and regenerative of resources. A circular economy requires decoupling economic activity from the consumption of finite resources in order to eliminate waste, improve efficiencies, and reduce risks. In addition, a circular economy seeks to redefine growth by focusing on building natural, social, and economic capital.

SCHEDULED FIRST OFFERING: Fall 2021

SUSTAINABILITY ACCOUNTING & REPORTING (3)

INSTRUCTOR: Mr. Brian MacNamara (brian59@vt.edu)

This course offers a comprehensive overview of the accounting, evaluation, compliance, and reporting systems and practices needed by sustainability professionals. Topics include: governance by disclosure through accountability and transparency; climate, water, and human rights; labels, certification, standards, and roundtables; reporting for businesses and government organizations; international and sectoral differences in sustainability reporting platforms and practices.

SCHEDULED FIRST OFFERING: Spring 2022

SUSTAINABLE PURCHASING & SUPPLY CHAINS (3)—COMING SOON

INSTRUCTOR: TBA

Around the world, individuals and communities are experimenting with satisfying their needs more sustainably across key lifestyle domains, including food, transportation, housing, consumer goods, and leisure. Likewise, businesses are managing their supply chains to improve resource efficiency and reduce risk. How do these individual initiatives and campaigns scale-up and contribute to more sustainable systems of production and consumption at regional and global scales? Who are the key stakeholders, and what are the strategies they are using to achieve sustainable development goals?

SCHEDULED FIRST OFFERING: Summer 2021



Elective Classes

Water and Marine Systems

COASTAL & MARINE SYSTEMS (3)

INSTRUCTOR: Dr. Daniel Marcucci (marcucci@vt.edu)

Approximately 3 billion people, or half of the world's population, live within 200 kilometers of a coastline, and that figure is projected to increase dramatically by 2025. Coastal areas represent complex socio-ecological systems that provide valuable ecosystem services to people and the planet. Coastal management is concerned with protecting, conserving, and managing coasts and coastal resources, and requires an interdisciplinary approach to understanding and negotiating often-competing interests.

OFFERED: Spring

INNOVATIVE WATER PARTNERSHIPS (3)

INSTRUCTORS: Dr. Seth Brown (sbrown73@vt.edu)

Ms. Dominique Luekenhoff (domlu17@vt.edu)

This course will focus on financing and alternative project delivery in the water sector. Topics will range from technical aspects of the Clean and Drinking Water sectors, regulatory and legislative issues, funding and financing challenges and innovations in the water sector, and public-private partnerships. The basis of the course is an emerging platform known as the Community-Based Public-Private Partnership (CBP3) program, also known as the Community-Based Public-Private Performance Partnership (CBP4) approach, which incorporates all aspects of the topics covered in this course.

OFFERED: Spring

WATER CONFLICT & MANAGEMENT (3)

INSTRUCTOR: Dr. Desiree Di Mauro (ddimauro@vt.edu)

Water is a vital resource to Earth's 7 billion humans. Only 3% of the Earth's water is potable, and it is not evenly distributed. Some countries have easy access, while others have too little or too much. In this course, we'll study the management of water resources in the U.S., Bangladesh and Kiribati, the Tigris-Euphrates Basin, and Brazil. Students will be introduced to the basic issues surrounding water management, and then case studies will be used to investigate examples of water management and conflict around the world.

OFFERED: Fall

WATERSHED STEWARDSHIP (3)

INSTRUCTOR: Dr. James Egenrieder (jime@vt.edu)

This course was developed with an interdisciplinary focus covering: watershed identification and mapping; watershed characteristics and evaluation; stormwater engineering; stream corridor restoration; water quality monitoring; native plants and animals; exotic and invasive species; public education; volunteer coordination and training; roles and activities for teachers and students; and advocacy training.

OFFERED: Fall