**Master of Environmental Studies Electives (Spring and Summer 2017)**

*See evergreen.edu/mes for a full description of each course*

**SPRING 2017**

**Disease Ecology: Parasites, Pestilence and Populations (Tara Chestnut)**

This course provides an introduction to the field of disease ecology, an area of study that has developed rapidly over the past three decades, and addresses some of the most significant challenges to human health and biological conservation. Students will obtain an appreciation for the incredible diversity of parasitic organisms, arguably the most abundant life forms on the planet, and examine how parasites invade and spread through host populations. Ecological interactions between hosts and parasites will be examined from an individual and population-level perspective. Students will gain a basic understanding of the population biology of micro- and macro- parasites, mechanisms of transmission and causes and consequences of ecological and genetic heterogeneity. Laboratory exercises will introduce students to medical microbiology techniques and ecological research using an experimental approach. Specific topics include types of pathogens and their ecological properties, epidemiology and impacts on host populations, strategies used by parasites to exploit hosts, strategies used by hosts to evade parasites, role of ecology and evolution in the emergence of new diseases, and the role of parasites in biodiversity and conservation. The main objectives of this course are to increase student awareness and understanding of (i) the role parasites play in the ecology and evolution of animal populations, including humans; and (ii) the relevance of ecological and evolutionary considerations in managing infectious diseases in individual human or animal hosts and populations.

**Environmental Advocacy (Edward (Ted) Whitesell)**

Prevention and resolution of environmental problems depends significantly on effective environmental advocacy.  Science, government regulation, and market mechanisms are insufficient without it.  The purpose of this elective is to learn and practice skills needed to be an effective environmental advocate, including analysis of a contested policy situation, development of an effective strategy to affect its outcome, and methods for implementing the strategy through organized, collective action.  This knowledge is useful for those working within government, the private sector, environmental advocacy groups, and as citizen activists.  We will study cases that illustrate the successes and failures of various attempts to influence events, including guest lectures by participants in those cases.  We will learn to practically apply social science theoretical frameworks in ways that help create effective strategy.  The course provides a critical survey of approaches to environmental advocacy – from global to local – emphasizing strengths and weaknesses.  Students will research, write and present on a case of their choosing, preferably from their own experience that illustrates the principles we study.  After taking the course, students should have improved abilities to diagram the sequence of events leading to an environmental policy decision, locate decision points and key players, find pivotal opportunities for intervention, assemble coalitions capable of effecting change, and act ethically and appropriately to carry out strategy from within their role in the public or private sector.

**Aquatic Ecology (Erin Martin)**

Inland waters (lakes, rivers, streams, reservoirs, wetlands and groundwaters) are some of the most threatened ecosystems on Earth. Yet they provide critical ecosystem services: providing food and freshwater, regulating climate, and detoxifying pollutants. In this course, we will examine inland waters as ecological systems that interact with their drainage basin and the atmosphere. We will also explore how physical, chemical, and biological processes operate and impact the organisms found within each ecosystem. Finally, we will study the way inland waters, as hotspots of biogeochemical activity, contribute to fluxes for greenhouse gasses. Case studies of real-world problems (e.g., eutrophication, deforestation, climate change) will be used to assess the effect of anthropogenic changes on inland waters and watersheds. This program will include lectures, laboratories, and at least one field trip to gain experience with sampling techniques in aquatic ecology.

**Introduction to GIS (Mike Ruth)**

This course will teach students how to use the versatile technology of Geographic Information Systems (GIS).  GIS is more than map-making.  A GIS integrates computer hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information across a wide variety of disciplines. GIS technology is increasingly used by physical and social scientists, policy makers, businesses, environmental and conservation organizations, utilities, public health providers, the military, and educators, to name a few.  More and more organizations are using spatial data and analysis to help them make decisions relating to acceptable land uses, allocation of resources and assets, fairness and social wellbeing, and many other needs. Instruction will rely strongly on weekly hands-on labs and homework exercises to guide students through a public policy decision process from beginning to end over the duration of the quarter.  Students will learn to manage spatial data and tools, mainly using the **[Esri suite of software](http://www.esri.com/)** commonly known as ArcGIS. No previous experience with GIS is required.  Student versions of the ArcGIS software suite will be made available for home use (but technical support is limited to college computers).

**SUMMER 2017 Electives**

**Environmental Leadership (Peter Goldmark)**

Accelerated environmental change is the new normal. This dynamic course will begin with a review of the current status of global and local impacts of such change. We will identify opportunities and methods that will help students develop the necessary leadership skills to address this emerging crisis. The class will first explore past environmental successes and examine a variety of approaches and collaborations used in Washington state; looking closely at what has worked and what hasn’t, and what techniques will be most useful for successful environmental stewardship in the future. The following is a list of past successes for review and analysis:

• The Early Winters project in the Methow Valley, ca 1980’s

• The proposed gravel mine on Maury Island, ca 2008

• The Pit to Pier project in eastern Jefferson Co., ca 2014

• The creation of the Teanaway community forest in Kittitas Co., ca 2013

• The SSA Marine proposed coal terminal at Cherry Point, Whatcom Co., ca 2016

By clearly understanding the process and manner of resolving these past challenges, in the second phase of this class, students will apply this knowledge to propose innovative solutions to the following current environmental challenges:

• The Dept. of Natural Resources trust land plan for conservation of the marbled murrelet in Western Washington

• The Dept. of Ecology’s efforts to create a no-discharge zone in the Puget Sound

These case studies will be student led, working in small teams, with the goal of understanding the essential role of leadership in shaping solutions across diverse interest and political groups. Student teams will examine and evaluate the role and leadership qualities of members of the public and responsible officials in crafting success. Team presentations will demonstrate thorough research, critical thinking and professional presentation skills of the issues under study. Peer evaluations will be part of each presentation. Two planned field trips, one in the Hood Canal area and one on the Columbia river, will provide the class with an opportunity to talk with environmental leaders, view the project area, and discuss the realities of both past and current mega projects and their potential impacts. The ultimate goal of this class is to inspire and equip students with the knowledge and skills needed to become effective environmental leaders.