STATE UNIVERSITY OF NEW YORK

NEW PALTZ

Biology Today – Biology 112 - 3 credits Spring 2017

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**Required Text** - Taking Sides - Clashing Views On Environmental Issues - Thomas Easton - 16th ed.

**General Overview of course:**

Designed to introduce students to selected aspects of biology science. By augmenting their understanding of biological concepts, students develop a deeper appreciation of the natural biological phenomena they are in contact with on a daily basis. In addition, students gain the working background necessary to understand contemporary biological issues such as environmental quality (population, pollution, global climate change), the human genome project, genetic engineering, and discoveries in medicine. When individuals become more biologically literate, they are also better equipped to make informed decisions that directly and indirectly impact their own lives.

**Course Organization**

We meet for two one-hour and fifteen minute classes per week. Attendance is imperative. ***The allowable maximum number of absences is 3.*** The final grade will be lowered appropriately if the allowable number of absences is exceeded. It is the responsibility of the student to make up any missed work due to absences. The student is responsible for all work assigned. Grading is based on presentations, exams and active student participation in class discussions.

I am available before and after class or any time convenient for the both of us. You can e-mail me any concerns you have about the course and its contents. What I want to emphasize with the students is the need to be up to date on the assignments. Most of the assignments are readings in the text due prior to our discussion in class which will then allow the students to participate in any discussion that follows. Keeping abreast of any current news items is encouraged.

**The course objectives will focus on environmental issues from different viewpoints**

The topics will include:

1. *The Precautionary Principle* - The Precautionary Principle says that those responsible for activities with the potential to cause harm to the environment or human health should prove in advance that they will not do harm and should take suitable steps to prevent any harm from happening. It has become incorporated in many pieces of national legislation and international treaties and is frequently mentioned in national and international court decisions.

Should environmental studies determine whether a new activity and practice is environmentally safe and sound and therefore, provide a framework for risk assessment and management (as is the predominant practice in the EU) or are these regulations unnecessary and a burden to the economy (as is often the case in the US).

2. *Principles versus Politics -* The mission of the Bureau of Land Management (BLM) is to preserve and protect public lands in their natural condition, but also to permit (and regulate) "multiple use," including ranching, farming, recreation, mining, fossil fuel extraction, and more. Inevitably, there are conflicts between some of these uses, and between many of them and environmental protection. Those who make their living by using public lands object to government attempts to protect the environment.

3. *Energy Issues -* Debate over the reality of global warming, its significance for humanity and the environment, and what to do about it has been vigorous. By 2012, most climate change deniers had moved from saying "The climate is not changing!" to admitting that it is, in fact, changing, but not as a result of human behavior. The science, however, is incontrovertible. The climate is changing--warming and becoming prone to extremes--and the human role is at least "very likely." Should we be trying to turn the situation around? If so, how? Altering how much solar heat reaches Earth by geo-engineering is one approach.

Will the use of alternative renewable energy resources as opposed to non-renewable fossil fuels stop global warming or are we passed the tipping point for environmental calamity?

4. *Food and Population -* Many ecologists argue that the environmental problems faced by the world are exacerbated by human numbers. Without population reduction, the problems will become ever more difficult--and ultimately impossible--to solve. Other ecologists argue that the world's agricultural system currently produces enough food for at least double the current world population. The "over-population" myth of "unsustainability" is a scare tactic designed to control the lives of individuals and justify dehumanizing acts such as abortion and euthanasia.

Does genetically modified food help solve the world food problem or is it a ploy to monopolize and control seed production for profit?

5. *Hazardous Release -* "Synthetic biology" is constructing cells whose genes and chromosomes have been synthesized from raw chemicals in the lab. Its goal is to make cells with new and useful functions, such as making biofuels efficiently. Some biologists argue that the risks posed by synthetic biology to human health, the environment, and natural ecosystems are so great that Congress should declare an immediate moratorium on releases to the environment and commercial uses of synthetic organisms and require comprehensive environmental and social impact reviews of all federally funded synthetic biology research. Others argue that although synthetic biology is surrounded by genuine ethical and moral concerns--including risks to health and environment--which warrant discussion, the potential benefits are too great to call for a general moratorium.

An issue of great concern regards the many synthetic chemicals that have reached the environment and how they interfere with normal hormone function and threaten the reproductive functioning of wildlife and humans. One of these chemicals is bisphenol A, which has been linked to altered brain development, heart disease, and diabetes. Should the Environmental Protection Agency (EPA) act more quickly to evaluate and regulate these chemicals? Others argue that the effects of endocrine disruptors are at most quite modest, and the effects of bisphenol A are inconsequential and the Environmental Protection Agency (EPA) and Food and Drug Administration (FDA) need to stand by the science and resist political pressures, else "we place the entire system of checks and balances in danger."

6.*Factory Farming -* What is the effect of Concentrated Animal Feeding Operation (CAFO's) - Is

 This the Future of Our Food Supply? Is the Non-therapeutic Use of Antibiotics to Promote

Animal Growth Leading to the Rise of "Superbugs"? Why are farm practices mimicking that of

an assembly line in industrial factories? What happened to the family farm?