COURSE COMPETENCIES FOR BIOLOGY 1510- ENVIRONMENTAL SCIENCE

competency	evaluation method	teaching method
Chapter 1- Environmental Problems and their causes		
Define environment and identify the elements of earth and solar capital	exam	lecture
Define sustainability and discuss issues relating to resource availability versus use by industrialized countries	exam	lecture/case study
Explain the concept of exponential growth of human population	exam	lecture
Explain the concept of the tragedy if the commons	exam	lecture
Define pollution and identify both point and non-point sources of pollution	exam	lecture
Identify the factors that determine a pollutant's effect on the environment	exam	lecture/case study

competency	evaluation method	teaching method
Discuss the conversion of human society from a base in hunting/gathering, to agriculture to industry	exam	lecture
Identify strategies for sustainable living	exam	lecture
Chapter 2- Science, Matter and Energy		
Define science and discuss the formulation of a scientific law.	exam	lecture
Define environmental science and explain how it is a multi-disciplinary science	exam	lecture
Define matter and distinguish among elements, mixtures, and compounds	exam	lecture
Identify important organic and inorganic compounds	exam	lecture
Define energy and identify different forms	exam	lecture

competency	evaluation method	teaching method
Explain the Law of Conservation of Matter	exam	lecture
Define nuclear radiation and define half-life.	exam	lecture
Chapter 3- Ecosystems and How They Work		
Define basic terms such as cell, metabolism and mutations	exam	lecture
Explain the cycling of matter and nutrients and the process of photosynthesis	exam	lecture
Understand the differences in terms such as species, population, habitat, community and ecosystem	exam	lecture/film
Explain the cycling of carbon, nitrogen, phosphorous and sulfur	exam	lecture
Explain the such hydrologic cycle components as evaporation, transpiration, condensation, precipitation, infiltration, and percolation	exam	lecture

Discuss how humans interfere with the natural hydrologic cycle	exam	lecture

competency	**evaluation method**	**teaching method**
Chapter 4- Evolution and Biodiversity		
Define the following types of species: specialists, native, immigrant, indicator and keystone	exam	lecture
Explain such species interactions as predation, parasitism, mutualism and commensalism	exam	lecture/film
Chapter 5- Ecosystems: What are the Major Types, and What Can Happen to Them		
Define biomes and identify the different types	exam	lecture/films
Describe the characteristics of a desert	exam	lecture/film/map exercise
Distinguish among the different types of grassland biomes.	exam	lecture/film/map exercise
Identify the differences in various forest biomes	exam	lecture/film/map exercise

competency	**evaluation method**	**teaching method**
Describe the life zones of oceans and define estuary	exam	lecture/film
Identify and describe the freshwater biomes	exam	lecture
Chapter 7- The Human Population		
Discuss issues influencing population growth	exam	lecture
Define total fertility rate and explain why it is dropping in the U.S.	exam`	lecture
Identify factors encouraging increased longevity	exam	lecture/mortality statistical exercise
Discuss problems resulting from increased urbanization around the world	exam	lecture
Chapter 18- Environmental Economics and Politics		
Explain how environmental protection	exam	lecture

is economically prudent

competency	evaluation method	teaching method
Identify major environmental laws, regulatory agencies, and watchdog groups	exam	lecture
Chapter 8- Risk, Toxicology, and Human Health		
Identify cultural, chemical, physical and biological hazards to human health	exam	lecture
Identify types of toxic, safety, carcinogenic, mutagenic and teratogenic health hazards	exam	lecture
Identify biological health hazards and name the world's deadliest diseases	exam	lecture
Chapter 15- Air and Air Pollution		
Differentiate between primary and secondary pollutants and identify sources of each	exam	lecture
Identify some of the major air	exam	lecture

pollution episodes worldwide		
Discuss the effects of air pollution	exam	lecture/film/internet exercise

competency	**evaluation method**	**teaching method**
Identify air pollution control methodology	exam	lecture/film
Chapter 16- Climate, Global Warming, and Ozone Loss		
Define climate and its factors	exam	lecture
Discuss factors determining patterns of global air circulation	exam	lecture
Define greenhouse effect	exam	lecture
Identify the major greenhouse gases	exam	lecture
Describe anticipated impacts of a warmer world	exam	lecture
Discuss causes and impacts of damage to the ozone layer	exam	lecture
Identify attempts to prevent stratospheric ozone depletion	exam	lecture

Chapter 11- Water

Explain the importance of water in agriculture, industry, transportation, recreation, and power generation	exam	lecture

competency	**evaluation method**	**teaching method**
Discuss groundwater and its importance	exam	lecture/film/case study
Identify classes of water pollutants	exam	lecture
Discuss methods by which water sources are protected	exam	lecture

Additional projects to be completed inside and outside of class include the preparation of an environmental quality report for each student's community and research projects related to environmental management activities in the Big South Fork Management Area, the Obed Wild and Scenic River and the Land Between the Lakes management area. Students will also conduct an epidemiological investigation via an interactive web exercise. Additional exercises are introduced as events occur and are covered by the media.