

BIO 130 - 01 Environmental Science

Mondays and Wednesdays, Noon – 1:20 pm
Academic Bldg. (Pemberton), Room 119

Syllabus

(Subject to Change)

Week 1: Overview of Environmental Science. Ecology. Environmental sustainability. The scientific method. Scientific decision making. Risk assessment. Precautionary principle.

Week 2: Environmental Ethics. The role of values. Worldviews. Politics of the environment. Historical milestones in environmental science. Economics of the environment. The cost of pollution. Economic strategies.

Week 3: Chemistry, Biochemistry and Energy. The structure of matter. Chemical bonding. pH. Biological compounds. Laws of thermodynamics. Photosynthesis, respiration and chemosynthesis.

Week 4: **TEST #1**. Ecology. Populations, communities, ecosystems. Producers, consumers, decomposers. Energy flow through ecosystems. Biogeochemical cycling. Major Biomes. Genetic variation and evolution.

Week 5: The Human Population. Population biology. Carrying capacity. Demographic structure. Fertility Rates. Population projections. Reducing fertility.

Week 6: Agriculture and Forest Resources, Soils. Soil formation, composition and conservation. Irrigation. Fertilizers and eutrophication. Grazing. Pesticides, integrated pest management. Genetically Modified Crops, forest products and management.

Week 7: Human Health and the Environment. Natural and synthetic toxicants. Sources and persistence. Epidemiology. Risk assessment and risk management.

Week 8: **TEST #2**. The Atmosphere and Air Pollution. Structure of the atmosphere. Climate and circulation. Primary and secondary pollutants and their affects on organisms. Ozone depletion. Acid rain. Indoor pollution.

Week 9: Global Climate Change. Naturally occurring climatic changes. Greenhouse gases and greenhouse effect. Methods of study. Effects of global warming. Economics of climate change.

Week 10: Ocean and Freshwater Resources. Ocean currents. Ocean ecosystems. Fisheries. Human impacts. Estuaries. Hydrogeologic cycle. Aquifers. Riverine and Lacustrine ecosystems. Consumptive and non-consumptive uses. Water quality and pollution.

Week 11: **TEST #3**. Biodiversity and Conservation Biology. Importance of diversity. Species diversity and taxonomy. Habitat diversity. Distribution of diversity. Extinction and mass extinctions. Conservation. Island biogeography. Laws and international treaties.

Week 12: Nonrenewable and Renewable Energy Resources. Coal formation and extraction. Oil supply, economy and conservation. Natural gas. Impacts of using fossil fuels. Political impacts. The nuclear alternative. Fission and fusion. Renewable Energy Resources. Biomass. Hydroelectric. Solar energy. Wind energy. Geothermal and ocean sources of energy. Hydrogen. Energy conservation.

Week 13: Waste Management. Wastewater sources and treatment. Municipal and industrial solid waste. Management and recycling. Hazardous wastes. Superfund sites.

Week 14: Urbanization and Sustainable Development. Global trends in urbanization. Sprawl. Creating livable cities. Growth versus progress. Globalization. Environment and democracies. **TEST #4**.

FINAL EXAM during exam week.

Grading: Grades will be based on the average of four tests given throughout the semester. The exams will consist of “objective” type questions (multiple choice, fill in the blank, etc.) and short essays. These four tests will cover only the material since the last test. The final exam is optional and will be cumulative, i.e., it will cover material from the entire semester. If the final exam is taken, the lowest grade received on the four tests will be discounted. If the lowest grade received is that of the final exam, then the final will be discounted. If a test is missed, the final must be taken. All tests will be given in Acad. 119. Make-up exams will be given during finals week.

Grades:

A = 90 – 100

B+ = 85 – 90

B = 80 – 84

C+ = 75 – 89

C = 70 – 74

D = 60 – 69

F = < 60

X – An X grade will be given only if the student is receiving a C or better at the time of the contract.

Text: Essential Environment. The Science behind the Stories. By Scott Brennan and Jay Withgott. Benjamin Cummings. 2008.
ISBN: 0-8053-9573-3

Attendance will be taken before every class. Please let me know ahead of time if you are unable to attend. It is the student’s responsibility to obtain material from missed lectures.

Instructor:

Dr. Patrick Slavin

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Office Hours:

Monday/Wednesday/Friday – Parker 331J, 9 – 10 am

Tuesday/Thursday – Laurel Hall (Mt. Laurel) 11 - Noon